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THE NEW  
INTERNATIONAL  
ENCYCLOPÆDIA

SUPPLEMENT

VOLUME I

NEW YORK  
DODD, MEAD AND COMPANY  
1980



## PREFACE TO THE SUPPLEMENT

A SUPPLEMENT to the NEW INTERNATIONAL ENCYCLOPÆDIA was issued in 1924. The success achieved by that SUPPLEMENT and its demonstrated usefulness have led the publishers to undertake the present revision with the object of including a discussion of the most recent events and phases of progress, as well as readjusting further the various articles to a perspective that even in five years has changed. The proper appreciation of the march of history requires that our own times should be understood in view of rapid economic developments and the advance of science and industry. In these fields, the new SUPPLEMENT supplies the latest information in such a manner as to render it immediately available to the general reader.

Many of the problems left from the War, it is realized today are far from settled, but there have been important developments due to the League of Nations, growing progress toward general disarmament, and an industrial development with due regard for the rights of the individual. On the other hand, enmities and suspicions have not vanished, and the world's readjustment has been undertaken with a frank realization of the difficulties involved. There have been serious political questions the world over, and it is necessary for the user of an encyclopædia, or in fact anyone who would understand the march of current events, to be able to coördinate and adjust recent happenings to the War and the succeeding years.

Commerce and industry, science and philosophy, educational activity and religious thought, all have progressed, and these must be correlated not only with each other, but with the events of an earlier past. New topics of vital interest have come to our attention and new problems have developed in addition to those for which real or partial solutions have been found. It is a discussion of these that is offered in the present SUPPLEMENT. Applicable and meritorious matter of the former volumes has been retained, but to it have been added the fruits of recent scholarship. Many new biographies of men and women are included, while the deaths of those who have died in recent years will be found appropriately noted. Current topics of political and social discussion are presented, not in any partisan spirit but with a due regard to their fundamental bases, to which reference most advantageously can be made to the regular volume of the NEW INTERNATIONAL ENCYCLOPÆDIA. In the bibliography accompanying many of the articles, titles of the latest and most useful books have been included.

To classify the present volume or to outline its plan and scope, would be unnecessary here, even were space available. The SUPPLEMENT, as does the NEW INTERNATIONAL ENCYCLOPÆDIA, speaks for itself, and its plan and scope are so simple that neither explanation nor suggestion is required. As usual, the biography is written by the editorial staff and special contributors; current history by members of the staffs of Columbia University, New York University, the United States Department of Commerce, and by others. The commercial and financial record for foreign nations is derived from the most recent and official statistical reports; while, for the United States, not only Finance and Banking, but such modern developments as Chain Stores, Installment Selling, and Investment Trusts have been authoritatively presented. Agriculture, with its many pressing problems, is treated by a group of specialists in the United States Department of Agriculture who, contributing to the NEW INTERNATIONAL ENCYCLOPÆDIA and the NEW INTERNATIONAL YEAR BOOK for many years, have made these articles models of accuracy, comprehensiveness, and succinctness of statement.

In Chemistry, the SUPPLEMENT presents a new treatment. In Psychology, the progress of this ever-growing science is discussed. New contributors are included for Civil Engineering, Power Engineering, and Motor Vehicles; while Municipal Affairs and Engineering and Electrical Engineering remain in the same competent hands. In Literature, the SUPPLEMENT supplies a valuable record of recent literary activity in the various nations, important alike to the student and the librarian, with the useful development that a somewhat further subdivision characterizes the present work. Industries and Manufactures, Medicine, Labor Topics, Law, Mineralogy and Mineral Production, Music, Painting and Sculpture, Philology, both Classical and Modern, Philosophy, Railways, Social Science, which, of course, includes Prohibition and Welfare Work, Zoology, etc., all are presented

comprehensively. Photography and Motion Pictures, recognized in view of their growing importance and application, receive new and special treatment from highly competent authorities; while the article on the Theatre records dramatic advances.

In addition to the revision of the Gazetteer articles, giving the most recent information regarding the United States and foreign countries, there is included treatment of the leading American Cities and also as a distinct and novel feature, a thoroughly up-to-date discussion of the larger European Cities with their post-war developments and present industrial status. In short, the general plan followed has been not so much to reproduce the minor entries that make the *ENCYCLOPÆDIA* itself so useful, but to group allied subjects so that they receive well-rounded treatment.

HERBERT TREADWELL WADE.

December, 1929.



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# THE NEW INTERNATIONAL ENCYCLOPÆDIA

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**ABBÉ, ROBERT** (1851-1928). An American surgeon and prolific writer in nearly every field of operative surgery. He was born in New York City, and educated at the College of the City of New York in 1870 and Columbia University (M.D., 1874). A pioneer in 1904 in the surgical use of radium, he soon became an authority in this field. He was a vigorous opponent of the theory that tobacco was a cause of cancer. He was connected with several of New York's leading hospitals, including St. Luke's, New York Cancer, and New York Post-Graduate, and held the professorships of surgery in the New York Post-Graduate Medical School and Woman's Medical College. He retired from active practice and teaching in 1923.

**ABBOT, CHARLES GREELEY** (1872- ). An American astrophysicist (see Vol. I). In December, 1918, Dr. Abbot became Assistant Secretary of the Smithsonian Institution, acting as Secretary on the decease of Dr. C. D. Walcott in 1927 and until his election as Secretary Jan. 10, 1928. In 1919 he conducted another expedition to observe a total solar eclipse. Using a spectroheliometer, he succeeded in measuring the heat of the stars to within  $\frac{1}{100,000,000}^{\circ}$ . The experiments began in 1922 and were carried on at the Mount Wilson Observatory in California with the aid of the great 100-inch reflector. The results are regarded as of the highest interest to scientists. He received the Draper Medal of the National Academy of Sciences and the Rumford Medal of the American Academy of Arts and Sciences. His later works included *Everyday Mysteries* (1923); *The Earth and the Stars* (1925), with S. A. Mitchell; *Fundamentals of Astronomy* (1927); a revised edition of *The Sun*, which originally appeared in 1911 (1927), and, with F. E. Fowle and L. B. Aldrich, he published vols. iii and iv of the *Annals of the Astrophysical Observatory*, giving proof of the variability of the sun, resulting from experiments in California and Algeria simultaneously and later expeditions to Arizona and Chile.

**ABBOTT, EDVILLE GERHARDT** (1871- ). An American orthopedic surgeon, born in Hancock, Me., and educated at Bowdoin College and at European universities. He became well known through his mechanical so-called Abbott method of treatment of lateral curvature of the spine. In 1913 he demonstrated his method in England

and on the Continent. He was professor of orthopedics at Bowdoin College, and has been connected with the Maine General Hospital, the Children's Hospital, Portland, Me., and other institutions in that city. He wrote *Treatment of Scoliosis*, which was translated into several foreign languages.

**ABBOTT, EDWIN MILTON** (1877- ). An American lawyer, born at Philadelphia and educated at the Central High School there and the University of Pennsylvania. He was admitted to the bar in 1896 and subsequently distinguished himself in criminal cases. He was chief counsel in the fight of the Philadelphia commuters against the railroads; a member of the Pennsylvania House of Representatives, 1911-12; chairman of the Commission on the Revision of Criminal Laws of the State of Pennsylvania, 1912-15 and 1917-23; and in 1913 minority nominee for judge of the Court of Common Pleas. He was appointed secretary of the American Institute of Criminal Law and Criminology in 1913.

**ABBOTT, ELEANOR HALLOWELL** (Mrs. FORDYCE COBURN) (1872- ). An American writer of light, romantic stories. She was born at Cambridge, Mass., and was educated in private schools and at Radcliffe College, where she was a special student. Besides being a frequent contributor to magazines, she wrote: *The Sick-a-Bed Lady* (1911); *The White Linen Nurse* (1913); *Little Eve Edgarton* (1914); *The Indiscreet Letter* (1915); *Molly Make-Believe* (1916); *The Stingy Receiver* (1917); *Ne'er-do-much* (1918); *Old-Dad* (1919); *Peace on Earth* (1920); *Rainy Week* (1921); *The Fairy Prince, and Other Stories*, a collection of stories published previously in magazines (1922); *Silver Moon* (1923), and *Love and the Ladies* (1928).

**ABBOTT, GRACE** (1878- ). An American social worker, born at Grand Island, Neb., and educated at the Grand Island College, the University of Nebraska, and the University of Chicago, from which she received the degree of Ph.M. in political science in 1909. She was director of the Immigrants' Protective League (1908-17) and a resident of Hull House, Chicago (1908-15). She was director of the Child Labor Division of the Children's Bureau, U. S. Department of Labor, Washington, D. C. (1917-19), executive secretary of the Illinois Immigrants' Commission (1920-21), and chief of the Children's Bureau U. S. Department of Labor since

1921. She served as unofficial representative of the United States on the advisory committee of the League of Nations on traffic in women and children (Geneva, 1923), and as president of the National Conference of Social Work (1923). Miss Abbott wrote *The Immigrant and the Community* (1917) and has contributed to various periodicals.

**ABBOTT, LAWRENCE FRASER** (1859- ). An American editor and writer, son of Lyman Abbott. He was born in Brooklyn, N. Y., and graduated from Amherst College in 1881. From 1891 to 1923, he was president of the company publishing the *Outlook* and, after 1923, director and contributing editor. He received the degree of Litt.D. from Bowdoin College and from the University of Vermont in 1923 and in 1925-26 was president of the New England Society of New York. He was secretary to Theodore Roosevelt during the latter's tour of Europe and Africa and edited Roosevelt's *African and European Addresses* (1910) and wrote the introduction to the work. He wrote *Impressions of Theodore Roosevelt* (1919); and *Twelve Great Modernists* (1927). He also edited *Letters of Archie Butt* (1924) and wrote a biographical sketch for the work.

**ABBOTT, LEONARD DALTON** (1878- ). An American publicist and radical leader, born in Liverpool, England. He went to the United States in 1897, and became a member of the staff of *The Literary Digest* in 1899. He early entered the socialist movement and remained an active worker up to 1905. His interests later turned to libertarian education, in which he at once assumed a prominent place. He was associated in the publication of *The Commonwealth*, *The Free Comrade* and *The Modern School*, and aided in the founding of the Rand School of Social Science, the Intercollegiate Socialist Society, the Ferrer colony, and the Ferrer School at Stelton, N. J. He wrote *Ernest Howard Crosby, A Valuation and a Tribute* (1907) and *Francisco Ferrer, His Life, Work, and Martyrdom* (1910). He wrote many tracts and pamphlets. From 1905 to 1925 he was one of the editors of *Current Literature*, later *Current Opinion*.

**ABBOTT, LYMAN** (1835-1922). An American Congregational clergyman and editor (see Vol. I). Dr. Abbott was a believer in military preparedness and during the World War was a strong supporter of the government's war policies. As editor of the *Outlook* (New York), Dr. Abbott obtained the coöperation of Theodore Roosevelt, who, after the close of his second term as President, was for a time contributing editor. Dr. Abbott's later writings included *Reminiscences* (1915); *The Twentieth Century Crusade* (1918); *What Christianity Means to Me* (1921).

**ABBOTT, WILBUR CORTEZ** (1869- ). American historian and educator (see Vol. I). In 1917 he wrote the *Expansion of Europe*, one of the most important modern American historical works, having as its theme the story of the commercial revolution which changed the character of European affairs and inaugurated the modern era. From 1908 to 1920, Professor Abbott was professor of history at Yale University and in the latter year went to Harvard University to fill a similar chair. His later works were, besides the one noted above; *Colonel John Scott of Long Island* (1918); *Conflicts With Oblivion* (1924), and *The New Barbarians* (1925).

**ABDERHALDEN, EMIL** (1877- ). A Swiss chemist and physiologist, born in the Canton of St. Gallen. He was educated at the University of Basle and took his medical degree at Berlin in 1902. After doing research under Prof. Emil Fischer, the distinguished chemist of Berlin, he was made professor of physiology in the University of Halle (1908) and director of the Kaiser Wilhelm Institute for physiology, 1914. Of much original research, his discovery of the so-called defensive ferments is best known, together with "Abderhalden's reaction" in connection with their demonstration. In addition to many articles, often in collaboration with others, he has published numerous books. His *Lehrbuch der Physiologische Chemie*, which first appeared in 1906, has gone through many editions including English translations; the *Handbuch der Biochemischen Arbeitsmethoden* appeared in 1909 and up to 1929 twenty-five volumes had been issued. Other works are *Physiologisches Practikum* (1912); *Abwehrfermente der Thierischen Organismen* (1913; also an English translation) and *Synthese der Zellbausteine* (1912; also an English translation). His crowning work is the immense *Biochemisches Handlexikon*, the publication of which began in 1910. Eleven volumes had appeared up to 1929.

**ABDUL AZIZ IBN SAUD**. See IBN SAUD.

**ABDUL HAMID II** ab'dul-há-méd' (1842-1918). Thirty-fourth sultan of the Ottoman Empire (see Vol. I). After his deposition in 1909, he was a state prisoner and was confined first in Saloniki, then in Constantinople (1912), and finally in Magnesia, near Smyrna (1915-18).

**ABDUL MEJID EFFENDI** (1868- ). Former Caliph at Constantinople, the son of Sultan Adul Aziz. He was a learned man, a patron of the arts, a painter, and a composer of music. One of his paintings was hung in the Paris Salon of 1914, at the request of Pierre Loti. After the Greek defeat in 1922, the office of sultan was abolished, the Sultan-Caliph Mohammed VI fled, and on Nov. 1, 1922, Abdul Mejid was made Caliph. President Mustapha Kemal Pasha caused the abolition of the caliphate on Mar. 3, 1924, and Abdul Mejid and his family were obliged to leave immediately for Switzerland. See CALIPHATE.

**ABENDROTH, HERMANN**, (1883- ). A German orchestral conductor, born in Frankfort-on-Main, Jan. 19, 1883. He received his musical education under Ludwig Thuille in Munich, and there began his career, in 1903, as conductor of the Orchesterverein. From 1905-11, he was conductor at the opera and of the Verein der Musikfreunde in Lübeck. In 1911 he went to Essen as municipal music director, whence he was called, in 1915, to Cologne in a similar capacity, succeeding at the same time Fritz Steinbach as director of the Conservatory and conductor of the famous Gürzenich Concerts. In 1918 he was made Generalmusikdirektor, and in the following year Professor. During the season of 1922-23, he conducted the symphony concerts of the Berlin Staatsoper.

**ABERCROMBIE, ab'ér-krüm'bí, LASCELLES** 1881- ). An English poet born at Ashton-upon-the-Mersey, Cheshire. He was educated at Malvern and Victoria University, Manchester, and lectured in poetry at the University of Liverpool, contributing at the same time to various magazines. In 1922 he became professor of English literature at the University of Leeds. His poetry has been characterized as in the Victorian tradi-

tion. His first work, *Interludes and Poems*, appeared in 1908. His other works include *Mary and the Bramble* (1910), *The Sale of St. Thomas* (1911), *Emblems of Love* (1912), *Deborah* (1912), *Thomas Hardy, a Critical Study* (1912), *Speculative Dialogues* (1913), *The Epic* (1914), *Theory of Art* (1922), *Four Short Plays* (1922), *Principles of English Prosody* (1923), *Phœnix* (1923), *Theory of Poetry* (1924), *Idea of Great Poetry* (1925), *Romanticism* (1926), *Twelve Idylls* (1928).

**ABERNON**, äb'ér-nôn, EDGAR VINCENT D', BARON OF ESHER (1857- ). A British diplomatist, born at Slinfold, Sussex, England, and educated at Eton. In 1877, he joined the Coldstream Guards and in 1880 began to serve in various civil capacities as British representative in the Near East. He was president of the Council of the Ottoman Public Debt in 1883 and, from 1883 to 1889, financial adviser to the Egyptian Government. Thereafter, until 1897, he was governor of the Imperial Ottoman Bank in Constantinople. He was elected a member of Parliament in 1899 as a Conservative and was raised to the peerage as Baron d'Abernon in 1914. He served as British Ambassador at Berlin 1920-26, and in the latter year he became chairman of the Industrial Fatigue Research Board. He wrote *A Grammar of Modern Greek* (1881) and collaborated in other publications.

**ABERT**, HERMANN (1871-1927). An eminent German musicologist (see VOL. I). He remained in Halle until 1919, when he was called to the University of Heidelberg, succeeding Wolfrum, but already in the next year he accepted a similar position at the University of Leipzig as successor to Riemann and, in 1923, he was called to succeed Kretzschmar at the University of Berlin. He died in Stuttgart, Aug. 13, 1927. The list of his works is completed by the following: *Johann Josef Abert* (1910; biography of his father), *Wolfgang Amadeus Mozart* (2 vols., 1919-21), *Goethe und die Musik* (1922), *Illustriertes Musiklexikon* (1927).

**ABNORMAL PSYCHOLOGY**. See **PSYCHOLOGY**, **ABNORMAL** and **CONSCIOUSNESS AND THE UNCONSCIOUS**.

**ABORTION**. At one time justifiable or therapeutic abortion was practiced principally in the case of women with narrow pelvis. Owing to the perfection of the aseptic Cæsarean operation, which now has a very low mortality and can be performed successfully by any good surgeon, interruption of pregnancy for simple contraction of the pelvis is no longer considered as wholly justifiable. On the other hand, in the interest of reducing maternal mortality from childbirth and in the salvage of maternal health, many obstetricians advocate and practice interruption of pregnancy in a series of pathological conditions, such as tuberculosis, heart disease, insanity, etc. This attitude receives some support from the birth control and eugenic movements, but there is an energetic counter-propaganda from religious bodies and from advocates of higher birth rates which tends to reduce cases of artificial termination of pregnancy to a small minimum; in other words, in nearly every case in which abortion is held to be justifiable, there are about as many good reasons for non-intervention. See **BIRTH CONTROL**.

**ABRUZZI**, ä-brööt'sé, LUIGI AMADEO OF SAVOY AOSTA, DUKE OF TIE (1873- ). An Italian vice admiral and explorer (see VOL. I). He was commander-in-chief of the Italian naval

forces in the World War, resigning in 1917. He afterward planned a colonization scheme in Somaliland.

**ABYSSINIA**. A kingdom of East Africa comprising the provinces of Harrar, Wollo, Gurage, Kaffa, Gore, Sayu, Benishangul, Wogera, Southern Tigré, Adowa and Aksum, Sokota, Lasta, Goffa, Nekemtí, and the Western Galla countries. The area has been variously estimated at from 350,000 to 430,000 square miles, although the former figure is probably more nearly accurate. The most recent estimate of the population places it at approximately 10,000,000, although the Abyssinians, properly so called, number less than 3,500,000. They are Christians of Hamitic origin. The capital is Addis Abeba, with a population of from 60,000 to 70,000. The other chief city, Harrar, has a population of about 40,000.

**Industry and Trade**. In spite of the richness of its resources, the economic development of the country has been retarded by the instability of the social life and the absence of a strong administrative machinery. Agriculture has remained primitive, and intercourse has been hindered by the want of means of communication. The products exported were only those of a pastoral and crudely agricultural country. For example, much of the coffee is wild. Hides and skins are the casual by-products of animals raised primarily for food and would be wasted for the most part if there did not happen to be a foreign demand for them. Wax is gathered from wild honeycombs and ivory is obtained from wild animals killed mainly for that valuable material. Grain, of course, is cultivated, but in a primitive manner. Other agricultural products include potatoes, beans, and other vegetables. Civet production might properly be called an industry, since it is achieved by organizing breeding farms of civet cats. Gums, such as gum arabic, gum tragacanth, and myrrh, are obtained by the usual simple process of tapping the trees of the countryside. Estimate figures, show that commerce is on the increase, totaling approximately £2,500,000 annually. With potentialities of such an amazing extent, Abyssinia might well become one of the most productive countries in the world. The principal trade route is the French-Ethiopian railway, connecting Djibuti in French Somaliland with Addis Abeba, a distance of 489 miles, which was completed in 1917. Trade is carried on by caravan in the interior and with the Sudan. British East Africa, British Somaliland, Italian Eritrea, and Italian Somaliland. Gambela on the Baro River, leased to the Sudan government in 1907, is an important trade centre, and a steamer service is maintained between it and Khartum.

**History**. In December, 1913, Lij Yasu, the young grandson of the Emperor Menelek II, succeeded to the throne. He embraced Islam and, under Turco-German influence, embarked on a policy of Moslem solidarity in cooperation with his father, Ras (Prince) Michael, whom he caused to be crowned king of the Moslem province of Wollo. In April, 1916, he openly acknowledged the overlordship of the Turkish Sultan as Caliph. The Emperor's policy, however, was opposed by most of the native chiefs and by the Christians. Finally, the Abuna, or head of the Abyssinian church, publicly proclaimed the dethronement of the Emperor on the ground of his apostasy (Sept. 27, 1916), and his aunt, the Princess Zauditu, was crowned empress

called higher mental processes, correlated by the cerebral hemispheres, in terms of reflex action. His conditioned reflex technique perfected in the course of animal research (see Pavlov, *Conditioned Reflexes*, 1927) has been, accordingly, applied to the study of human action in a purely objective fashion. It is his belief that all psychical phenomena are susceptible of study by the methods of the physiologist.

Still further evidence of the growing importance of action in the interpretation of mental phenomena is to be found in the recent studies of the emotions where X-ray photographs are employed to detect the reactions of internal organs during emotional states (see W. B. Cannon, *Bodily Changes in Pain, Hunger, Fear, and Rage*, 1918), and where the psychogalvanic reflex (Wechsler, *The Measurement of Emotional Reactions*, 1925) is used to measure changes in the sweat glands in emotion. Even in the case of imagery, which would ordinarily be thought of as divorced from bodily movement, Washburn finds a correlation, as a part of her general theory that "all association is association between movements" (see M. F. Washburn, *Movement and Mental Imagery*, 1916).

For a psychology in which action plays a predominant rôle, see R. S. Woodworth, *Psychology* (1921), and J. F. Dashielle, *Fundamentals of Objective Psychology* (1928).

**ADAM, PAUL** (1862-1920). A French writer (see Vol. I) and *porte-parole* of the symbolist movement, whose most celebrated novel, *La Ville Inconnue*, passed through more than a dozen editions. He was an active writer until the year of his death. During the World War, he engaged in propagandist activity and shortly before his death published *Reims Devastée* and *Le Lion d'Arras*, which portray the heroic ruins of northern France.

**ADAMI, JOHN GEORGE** (1862-1926). A British physician and pathologist, born in Manchester, England, and educated at Owens College and Christ's College, Cambridge, where he took a medical degree. After study on the Continent, he became house physician to the Manchester Royal Infirmary and at the same time a member of the faculty of the medical department of Cambridge University. In 1892 he was appointed professor of pathology and bacteriology at McGill University, Montreal, holding this chair for many years. From 1919-26 he was vice-chancellor of the University of Liverpool. He received numerous honors during his 27 years in America, including the presidency of the Association of American Physicians (1911-12). During the World War, he was a colonel of the Canadian Army Medical Corps and in 1919 he was made Commander of the Order of the British Empire. His standard literary contribution is *Principles of Pathology* (1st ed., 1908).

**ADAMS, ANETTE ABBOTT** (1877- ). An American lawyer, born at Prattville, Calif. She was educated at the Chico State Normal School, Calif., and the University of California. In 1912 she was admitted to the California bar. She held the office of Assistant United States Attorney for the Northern District of California, 1914-19, and in 1918-20 she was United States Attorney for the same district. In 1920 she was appointed an Assistant Attorney General of the United States. She resigned in 1921.

**ADAMS, CHARLES CHRISTOPHER** (1873- ). An American zoölogist, born at Clinton, Ill., and educated at Illinois Wesleyan University,

Harvard University, and the University of Chicago. He was curator of the Museum of the University of Michigan (1903-06), director of the Cincinnati Society of Natural History of (1906-07), associate in animal ecology at the University of Illinois (1908-14), assistant professor of forest zoölogy at the New York State College of Forestry (Syracuse University), 1914-16 and in 1916 he became professor. He was also director of the Roosevelt Wild Life Forest Experiment Station and, after 1926, director of the New York State Museum. Besides numerous papers on animal ecology, he published *An Ecological Survey of Isle Royal, Lake Superior*, in collaboration (1909); *Guide to the Study of Animal Ecology* (1915); *An Ecological Study of Forest and Prairie Invertebrates* (1915); and *Variations and Ecological Distribution of the Snails of the Genus Io* (1915).

**ADAMS, CHARLES FRANCIS** (1866- ). An American cabinet official and lawyer, the great-great-grandson of President John Adams. Born at Quincy, Mass., he attended Harvard University, receiving the degree of A.B. *cum laude* in 1888 and of LL.B. in 1892. He was admitted to the Massachusetts bar in 1893 and practiced in Boston with Sigourney Butler and later with Judge Everett C. Bumpus. He was mayor of Quincy in 1896-97 and in March, 1929, became Secretary of the Navy in President Hoover's cabinet. Besides being a director of numerous financial and business institutions he was treasurer of the Corporation of Harvard College for many years and in June, 1929, he received the honorary degree of LL.D. from that university. One of the leading amateur yachtsmen of the United States, he was skipper of the *Resolute* which won the International Yacht Races in 1920.

**ADAMS, COMFORT AVERY** (1868- ). An American electrical engineer and educator, born in Cleveland, Ohio. He graduated in 1890 from the Case School of Applied Science and later studied at Harvard University. For a year he was an electrical engineer with the Brush Electric Company. In 1891 he was called to Harvard, where he remained. He became professor of electrical engineering in 1906, in 1914 Lawrence professor of engineering, and Dean of the Engineering School in 1919. During the World War, he was chairman of the division of engineering of the National Research Council, and also served on the Council of National Defense, besides acting as chairman of the welding committee of the Emergency Fleet Corporation. He has acted as consulting electrical engineer for several large corporations. He has given much attention to the study of induction and synchronous motors, to commutations, and to dynamo design schedules. Besides holding membership in many scientific societies, he was president of the American Institute of Electrical Engineers in 1918 and of the American Welding Society in 1919. He was chairman of the American Engineering Standards Committee, 1918-20. He wrote *Dynamo Design Schedules* and many articles on electrical engineering.

**ADAMS, ELEANOR N.** (?- ). An American college president, born in Lebanon, Ohio, and educated at the Universities of Cincinnati, Oxford (England), and at Yale. She was a teacher in private schools in Cincinnati before 1911; instructor in English in the University of Cincinnati (1911-12); and professor of English (1915-18) at Oxford College for Women at Ox-



ford, Ohio, of which she was elected president in 1918. She is the author of *Old English Scholarship in England* (1917).

**ADAMS, FRANKLIN PIERCE** (1881- ). American poet and columnist (see VOL. I). As "F. P. A.," he has interested and charmed many newspaper readers. His intellectual honesty and his scorn for all pretense and stupidity, whether in politics, literature, or everyday affairs, have been factors in his popularity, and his light verse, strongly reminiscent of C. S. Calverley, his parodies, and his translations from the Latin poets, are among the best of their sorts written in America. In the *New York Tribune* and, after Jan. 1, 1922, in the *New York World*, his daily column, "The Conning Tower," has attracted contributors of prose and verse often quite as witty and perspicacious as his own. His latest published books were: *By and Large* (1914), *Weights and Measures* (1917), *Something Else Again* (1920), *Overset* (1922), *So there!* (1922), *So Much Velvet* (1924), and *Half a Loaf* (1927). He wrote, with O. Henry, a musical comedy, *Lo*.

**ADAMS, FREDERICK UPHAM** (1859-1921). American author, inventor, and industrial engineer (see VOL. I). In the latter years of his life, he became a leading exponent of Frederick W. Taylor's system of scientific management for industry. His publications after 1914 were *The Romance of Big Business* (1915), *Woodrow Wilson vs. Woodrow Wilson* (1919), and *The Open Shop* (1919).

**ADAMS, GEORGE BURTON** (1851-1925). American historian and educator (see vol. i). His studies of the English constitution which included *Outline Sketch of the English Constitution* (1918), *The British Empire* (1919), and *The Constitutional History of England* (1921) were favorably received in both England and America. The last named presented in epitome the fruits of the lifelong researches of the author, the purpose of which was to reject the Stubbs-Freeman explanation of the Teutonic origin of the English constitution and to establish his own theory of feudal or Norman antecedents.

**ADAMS, HARRIET CHALMERS** (1875- ). An American explorer and lecturer, born at Stockton, Calif. She made extensive journeys through Mexico in 1900 and through Central and South America (1903-06), exploring regions never before visited by a white woman. She visited Haiti in 1910 and the Philippines in 1912, and from 1913 to 1914 she traversed Asia from Siberia to Sumatra. In 1916 she was a war correspondent at the French front. On a tour of South America, 1919-20, Mrs. Adams reached frontiers not visited formerly by her. She made researches in Spain and Spanish Africa, 1923-24. Her work won for her a fellowship of the Royal Geographical Society of England, membership in the National Institute of Social Sciences and in the geographical societies of many countries, honorary membership in the Academy of Science and Art of Cadiz, Spain, and the presidency of the International Society of Woman Geographers. Mrs. Adams lectured extensively on her travels and wrote of them in various magazines.

**ADAMS, HENRY CARTER** (1851-1921). An American economist and educator (see VOL. I). His later works included *Description of Industry* (1918) and *American Railway Accounting* (1918).

**ADAMS, HERBERT** (1856- ). An American sculptor (see VOL. I). He received medals

of honor from the Panama-Pacific International Exposition and the Architectural League in 1915 and the Watrous Gold Medal from the National Academy of Design in 1916. He was twice president of the National Sculpture Society, and once (1917-20) of the National Academy of Design. Among his most important later works are two seated bronze statues, John Marshall and Rufus Ranney, and two historical figures, Stephen Langton and Simon de Montfort, for the courthouse of Cleveland, Ohio, and the graceful group of the McMillan fountain, Washington, D. C. He received the honorary degree of M.A. from Yale in 1916 and from Tufts in 1927.

**ADAMS, JAMES TRUSLOW** (1878- ). American historian. He was born in Brooklyn, N. Y., and, after graduating from the Brooklyn Polytechnic Institute (A.B., 1898), studied at Yale. From 1900 to 1912, he was a member of a New York Stock Exchange firm and acted as director of several banking, manufacturing, and railroad corporations. From 1912 on, he devoted himself entirely to literary and historical pursuits, publishing *Memorials of Old Bridgehampton* (1916) and *History of the Town of Southampton* (1918). Mr. Adams's first considerable historical work was the *Founding of New England* (1921), which won immediate recognition for its scholarly worth and stylistic qualities. He received the Pulitzer Prize for the best historical book of the year. Mr. Adams continued his chronicle with the volumes *Revolutionary New England, 1691-1776* (1923), and *New England in the Republic, 1776-1850* (1926). He also wrote *Provincial Society, 1690-1763* (1927).

He was with the Colonel House commission, early in the World War, to prepare data for a peace conference; later he was connected with the military intelligence division, general staff, United States Army, with the rank of captain, and in 1919 he was detailed on special duty at the peace conference in Paris.

He was a member of the Pulitzer Prize jury in 1924, 1925, and 1926.

**ADAMS, JOHN TAYLOR** (1862- ). An American manufacturer and politician, born at Dubuque, Iowa, and educated at the Dubuque High School. He entered the sash and door manufacturing business in 1881 and later became president of the Carr, Ryder & Adams Company. He entered politics in 1908 as manager of the successful campaign of United States Senator Allison. In 1912 he was manager of the Taft campaign in the Iowa primaries. In the same year, he was a member of the Republican National Committee for Iowa and was vice-chairman in 1917. From 1912 to 1916, he was a member of the executive and campaign committees, and from 1921 to 1924, chairman of the National Republican Committee. He was a member of the Iowa State Council of National Defense in 1917.

**ADAMS, JOSEPH QUINCY** (1881- ). An American educator and author, born at Greenville, S. C., and educated at Wake Forest College, the University of Chicago, Cornell University, and the universities of London and Berlin. After holding various pedagogical positions, he was appointed instructor in English in Cornell University in 1905 and became assistant professor of English literature in 1909 and professor in 1919. Wake Forest College conferred on him the degree of Litt.D. in 1917. Besides contributing to American and European philological journals, he wrote several valuable studies, especially in the field of the Elizabethan stage, which in-

clude: (With others) *Studies in Language and Literature* (1910); *The Conventual Buildings of Blackfriars, London* (1916); *The Dramatic Records of Sir Henry Herbert, Master of the Revels* (1917); *Shakespearean Playhouses* (1917); (in collaboration) *An Allusion-Book to Ben Jonson* (1922); *A Life of William Shakespeare* (1923); *The Pre-Elizabethan Drama* (1924); (in collaboration) *A Register of Bibliographies of the English Language and Literature* (1925). He edited Sheridan's *The Rivals*, and *The Turke*, by John Mason. He was associate editor of *Materialen zur Kunde des Aelteren Englischen Dramas* and joint editor of *Cornell Studies in English*.

**ADAMS, ROGER** (1889- ). An American chemist. He was born at Boston and graduated at Harvard in 1909 (Ph.D., 1912). He studied at the University of Berlin in 1912-13. He was instructor in organic chemistry at Harvard and Radcliffe (1913-16), assistant professor of the same subject at the University of Illinois (1916-18), professor there since 1919, and head of the chemistry department since 1926. In the World War, he was a major in the Chemical Warfare Service. He is a member of the National Research Council, was awarded the William H. Nichols Medal in 1927, and was elected to the National Academy of Sciences in 1929. Since 1922 he has been associate editor of the *Journal of the American Chemical Society*. He wrote *Organic Syntheses*, Vol. I (1921) and Vol. VIII (1927).

**ADAMS, SAMUEL HOPKINS** (1871- ). An American author and publicist (see VOL. I). The work he had done so effectively in exposing the quack medicine industry Mr. Adams continued in the field of dishonest newspaper advertising. He wrote *The Clarion* (1914) and *Success* (1921), both studies of modern journalism, and several other novels: *Little Miss Grouch* (1915); *The Unspeakable Peck* (1916); *Our Square and the People in It* (1917); *Common Cause* (1918); *Wanted, a Husband* (1919); *From a Bench in Our Square* (1922); *Siege* (1924); *The Piper's Fee* (1925); *Revelry* (1926), and *The Flagrant Fears*, (1929).

**ADAMS, WALTER SYDNEY** (1876- ). An American astronomer (see VOL. I). From 1913 to 1923, he was assistant director and after 1923, director, of the Mt. Wilson Observatory of the Carnegie Institution, at Pasadena, Calif. In 1917 he received the gold medal of the Royal Astronomical Society of London, and the Draper medal of the National Academy of Sciences in 1918. He was made chairman of the committee on classification of stellar spectra of the International Astronomical Union. His many papers were originally contributed to the *Astronomical Journal* and to the *Astrophysical Journal*, but they later appeared under the general title of *Contributions to the Mt. Wilson Observatory*. He is also the author of several memoirs, the most important of which was a series of four papers published in 1916 as *Investigations on Stellar Spectroscopy*.

**ADAMS, WAYMAN** (1883- ). An American portrait painter. He was born at Muncie, Ind., and studied at the John Herron Art Institute, Indianapolis (1905-09), in Italy (1910), and in Spain (1912). He was awarded the Thomas R. Proctor Prize of the National Academy of Design in 1914, the Logan Medal (with \$1500) at the Art Institute, Chicago, in 1918, the John C. Shafer Prize at the Hoosier Salon,

Chicago, in 1926, and the First Altman Prize of the National Academy of Design in 1926, and many others. In the same year, he became a member of the National Academy.

**ADAMSON, THE RT. HON. WILLIAM** (1863- ). British Labor politician, born at Halbeath, Fife. After working as a miner for many years, he became assistant secretary of the Fife and Kinross Miners' Association in 1902 and in 1908 its general secretary. He was elected to Parliament for West Fife in 1910, and when the Labor party was reorganized in 1917, he became its chairman. In 1918 he was sworn in as a member of the Privy Council. He was active as leader of the Labor Party in the House of Commons. When on Jan. 22, 1924, Ramsay MacDonald formed his Labor cabinet, Adamson was made Secretary for Scotland. He held the same post in the second Labor cabinet formed June 7, 1929.

**ADAMSON EIGHT-HOUR LAW.** See LABOR ARBITRATION; UNITED STATES, under *History*; and STRIKES.

**ADAPTATION.** The adjustment of a plant or animal to its environment or surroundings as shown in its structure, form, or habits. Adaptations are rarely or never perfect, and the elimination of the less well adapted in the struggle for existence has been supposed to be a factor in evolution. See ZOOLOGY.

**ADCOCK, ARTHUR ST. JOHN** (1864- ). An English, author, and editor, born in London. After practicing law, he turned to literature in 1893, and in 1908 became acting editor of the *Bookman*, which he has edited since 1923. He is a fellow of the Royal Society of Literature. In addition to contributing numerous essays, poems, and short stories to various periodicals, he published a number of books, including: *East End Idylls* (1897); *From a London Garden* (1903); *Admissions and Asides* (1905); *Exit Homo* (1921); *The Divine Tragedy* (1922); *With the Gilt Off; Gods of Modern Grub Street* (1923); *The Bookman Treasury of Living Poets* (1925); *City Songs* (1926); and *The Glory that was Grub Street* (1928).

**ADDAMS, JANE** (1860- ). An American settlement worker, lecturer, and contributor to publications devoted to sociology, economics, etc. (see VOL. I). She was a delegate to the International Women's Congress at The Hague (1915) and was elected its president. She was also a delegate to similar congresses held at Zurich (1919), Vienna (1921), The Hague (1922), and Washington, D. C. (1924). An avowed pacifist, Miss Addams has figured in movements looking toward the abolition of war. She published: *The Long Road of Women's Memory* (1916); *Peace and Bread in Time of War* (1922).

**ADE, GEORGE** (1866- ). An American humorist and playwright (see VOL. I). His latest books are: *Ade's Fables* (1914); *Hand-Made Fables* (1920), and *Single Blessedness* (1922). His play, *Nethie*, appeared in 1914, and he was the author of the photo-plays, *Our Leading Citizen*, *Back Home and Broke*, and *Woman Proof*.

**ADELPHI (à-dél'fi) COLLEGE.** A non-sectarian college of liberal arts for women in Brooklyn, N. Y.; founded in 1896. In 1913 the students enrolled in regular college courses numbered 176, and those in extension courses, 98; whereas, the enrollment in regular courses leading to the degree of Bachelor of Arts was 626 in the autumn of 1928 and there was a summer-school enrollment of 89. The faculty had in-

creased from 18 in 1913 to 44 by the autumn of 1928. The library was increased from 15,000 to 22,000 volumes during the same period. A campaign for the addition of \$1,000,000 to the endowment fund was conducted during 1922-23, and in 1925 a campaign for a similar amount secured the necessary pledges, with about one-half of the amount paid in by the end of the year. In 1928 three new buildings were under construction at Garden City, L. I., which were to be completed in time for the opening of the college in its new home in the autumn of 1929. President, Frank Dickinson Blodgett, LL.D.

**ADEN**, a'den or a'den. A peninsula and a British protectorate on the southeastern Arabian coast. Area of the peninsula, 75 square miles; of the protectorate, 9000 square miles. The island of Perim, included in the settlement, has an area of 5000 square miles. Population of Aden and Perim in 1911, 46,165; in 1921, 54,923; of the protectorate in 1921, about 100,000. Aden is an important entrepôt and trans-shipment station for the Red Sea country. Imports for 1911-12 were valued at £2,643,276; for 1926-27, 88,060,903 rupees; exports for the same years were £2,318,595 and 69,540,118 rupees. A railway was begun in 1915 to extend from Aden to Lahaj (25 miles) and has since been extended to Habil, eight miles beyond Lahaj. In 1921 administration was transferred from the India Office to the Colonial Office.

**ADLER**, ALFRED (1870- ). An Austrian neurologist, psychologist, and psychoanalyst, born in Vienna and educated at the university of that city. After a short period as assistant at the university medical clinic, he identified himself with neurology and its allied branches and later with the Freudian movement. He became widely known through his conception of the "inferiority complex" and through his visits to the United States. All his important works have been translated into English and have gone through later editions. They include *Studien über Minderwertigkeit von Organen* (1907, 3rd ed., 1927); *Ueber den nervösen Charakter*, (1912, 2nd ed., 1919); *Praxis und Theorie d. Individualpsychologie* (1924, 3rd ed. 1927), and *Understanding Human Nature* (1927).

**ADLER**, FELIX (1851- ). An American educator and reformer born in Germany (see VOL. I). Among his later publications are *The World Crisis and Its Meaning* (1915), and *An Ethical Philosophy of Life* (1918). In 1923 Dr. Adler delivered the Hibbert Lectures at Oxford, published later in that year as *The Reconstruction of the Spiritual Ideal*.

**ADLER**, GUIDO (1855- ). A distinguished Austrian musicologist (see VOL. I). He resigned his position as professor of Musicology at the Vienna University in 1927. Among other works he wrote: *Gustav Mahler* (1916), *Methode der Musikgeschichte* (1919), *Handbuch der Musikgeschichte* (1924).

**ADLER**, HERMAN MORRIS (1876- ). An American psychiatrist and criminologist, born in New York City. He graduated from Harvard University in 1897 and received his medical degree from Columbia University in 1901. He was assistant professor of psychiatry at the Harvard Medical School, 1912-17, and was chief of staff of the Boston Psychopathic Hospital. He removed to Chicago, 1910, to study the facilities there for the detection and care of mental infirmities and in 1917 was appointed State criminologist. In the same year, he became director

of the Juvenile Psychopathic Institute. In the World War, he was a major in the Medical Corps, U. S. Army, charged with special duty in disciplinary psychiatry at military prisons. In 1919 he became professor of criminology and head of the department of social hygiene, medical jurisprudence, and criminology at the medical college of the University of Illinois. He wrote the section on medical science and criminal justice in the criminal justice survey of the Cleveland Foundation (1921), and papers on psychiatric and criminological subjects.

**ADLER**, VICTOR (1852-1918). An Austrian Socialist leader (see VOL. I). He played only a passive part in the World War, but, with its termination, he once more took a prominent place in Austrian politics. With other Social Democrats, he advocated Austrian union with the German Reich. For a few days, he served as Austrian Foreign Minister, but his collapse and death, on Nov. 12, 1918, lost for the young and helpless Republic the counsel of one of its most astute politicians.

**ADLER**, WOLFGANG FRIEDRICH (1879- ). An Austrian politician, born at Vienna. He was educated at the Realgymnasium in Vienna and the University of Zurich and lectured in physics in Zurich, 1907-11. From 1910 to 1911, Dr. Adler edited the Social Democratic daily, *Volksrecht*, and for the next five years he was secretary of the Austrian Social Democratic Party and editor of *Kampf*. His sympathy for the Socialists during the World War and expectation of a rising of the proletariat led him at the breakup of the International (1916) to shoot the Austrian Prime Minister, Count Stürgkh. He was condemned to death on May 19, 1917. This sentence was commuted to 18 years' imprisonment and, in the chaos of 1918, he was amnestied. In 1919 he was elected to the National Assembly. He was president of the Austrian National Workmen's Council and secretary of the International Labor Association of Socialist Parties. It was due to his initiative that the last-mentioned was founded in 1921. His later works include *Die Erneuerung der Internationale* (1918); *Mach's Ueberwindung des Mechanischen Materialismus* (1918); *Ortszeit, Systemzeit, Zonenzeit und das Ausgezeichnete Bezugssystem der Electrodynamik, eine Untersuchung über die Lorentzische und die Einsteinsche Kinematik* (1920), and *Vor dem Ausnahmegericht* (1923).

**ADOR**, GUSTAVE (1845- ). A Swiss statesman, born at Geneva, where he studied law at the academy. He was twice mayor of Cologne and a member of the cantonal parliament almost continuously from 1874 to 1915. After holding other important government offices, he was elected, in 1901, president of the Swiss National Council, of which he was a member from 1899 to 1917. In June, 1917, he became councillor of the federal executive, head of the department of foreign affairs, and a member of Parliament, which elected him president for 1919. He represented Switzerland at the first meeting of the League of Nations, was president of the international finance conference in Brussels (1920), and in 1921 became chairman of the International Committee of the Red Cross.

**ADRENALIN**. Whereas in 1914 this drug was considered merely as a strong astringent, it has now become known as one of the most useful in the pharmacopoeia. It is a heart stimulant of great value and has sometimes reanimated the apparently moribund patient when in-

jected directly into the heart. Its power of constricting the blood vessels also makes it of value in hemorrhages. As a local astringent on mucous membranes, it is being supplanted to some extent by the newly introduced *ephedrine*, which forms more stable solutions and has a more persistent action. Adrenalin is also known as Suprarenin and Epinephrin. See SECRETIONS, INTERNAL.

**ADRIATIC SEA.** See FICME-ADRIATIC CONTROVERSY.

**ADSORPTION.** See CHEMISTRY.

**ADULT EDUCATION.** See EDUCATION IN THE UNITED STATES.

**ADVANCEMENT OF SCIENCE, AMERICAN ASSOCIATION FOR THE.** See SCIENCE, AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF. For BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE See SCIENCE, BRITISH ASSOCIATION FOR ADVANCEMENT OF.

**ADVENT CHRISTIANS.** See ADVENTISTS.

**ADVENTISTS.** The "Advent Movement" originated about 1840 with William Miller, who became convinced that the coming of Christ in person must be premillennial. Out of this movement there developed the following churches: The Advent Christian Church, the Seventh-day Adventists, Life and Advent Union, the Church of God, Adventist, and the Churches of God in Christ Jesus. The Seventh-day Adventists, the largest body of the group, differed from the other branches in that it never set a definite date for the coming of the Lord. Its membership increased throughout the world from 125,844 in 1914 to 285,293 in 1928. In North America, the number of members increased from 72,015 in 1914 to 113,737 in 1928, the number of churches rose from 2054 to 2229, and the number of ordained and licensed ministers from 769 to 1217. Fifty-six publishing houses and branches issued 5108 separate publications; and the total value of sales since the organization of the denomination was over \$78,000,000. In 1928 the denomination supported 222 mission fields and 175 colleges, theological seminaries, and intermediate schools. The activities of the church were carried on in 135 countries, by 18,806 evangelistic and institutional workers; there were 328 foreign institutions valued at \$49,293,887.27; and in 1927 the income amounted to \$41,018,692.33. Between 1924 and 1929, the church sent 876 missionaries to foreign territory and for the support of their work the United States and Canada contributed \$13,308,771.07 in 1928.

The membership of the Advent Christian Church had decreased from 30,597 in 1916 to 29,381 on Jan. 1, 1929, and the number of churches had fallen from 534 to 527. The figures of 1929, however, showed an increase over the previous year of 3144 members and 80 churches. There were, at the beginning of 1929, 504 ordained ministers in the denomination and 109 licensed ministers. The enrollment of the 333 Sunday schools was 20,139. The church supported four publishing organizations, several homes and orphanages, Aurora College, and the New England School of Theology.

**ADVERTISING.** In the important transitions and changes affecting modern business during the World War and in the years succeeding it, advertising naturally underwent an important development. This was quite natural as today advertising must be considered the most sensitive outpost of modern business, not only responding to changing conditions, but influencing

them in many instances. The stimulation of business activity during the years of war inflation led to an enormous increase of the expenditure for advertising, while of extraordinary interest was the entry of governments and semi-official agencies into selling campaigns which lent a new dignity to the profession.

The British government was the first to use advertising methods to sell its war bonds to the people of Great Britain and the United States. An expenditure of £100,000 was decided upon for newspaper and poster advertising. It produced extraordinary results, and the experiment was repeated on a larger scale in the United States when the Liberty Loans were floated in 1917 and 1918. The Victory Loan was sold to more than 21,000,000 individual bondholders. In fact, the poster as used for bond selling and recruiting in connection with the War marked the height of this form of advertising, both as regards its extent of use and the artistic and attractive character of the posters themselves often the work of famous artists.

In commercial advertising, the perfection of the four-color press has made it possible to illustrate the text appeal with pictures of advertised goods in their natural color and to use the work of skilled artists to present the matter in most attractive form. This development has been most prominent in American periodicals, but is also found in Europe. In magazines of national circulation, many pages of advertising are printed in colors and in addition to printing of high grade, skilled artists are employed to prepare the copy. The annual expenditure for advertising in the United States is said to be over \$1,500,000,000, although exact figures are not available. This expenditure certainly reflects a growth of more than 100 per cent since the War. Advertising, due to its extensive growth and the huge financial outlay involved, has built itself up as a professional activity, drawing some of the best brains in all of the more advanced countries.

In a survey made by the National Bureau of Economic Research, the amount spent on advertising in 1927 was estimated at \$1,502,000,000. Of this total, the estimates assigned \$690,000,000 to newspapers; \$400,000,000 to direct advertising; \$210,000,000 to magazines; \$75,000,000 each to business papers and outdoor advertising; \$25,000,000 to premium advertising, programmes and directories; \$20,000,000 to streetcar cards; and \$7,000,000 to radio advertising. The increase in expenditure on advertising between 1921 and 1927 was 50 per cent, 1923 and 1927 showing the largest increases in the period. It was stated that although the amount expended on advertising increased for a time at nearly double the rate of other increases in sales expenses, there has been a decline in this ratio since 1924. The most striking increases in advertising outlay in the period covered was in automotive equipment, clocks and watches, electric refrigerators, foods, home equipment, pens and pencils, radio sets, silverware, soaps and cleansers, and toilet articles.

The centre of the profession is the advertising agency, which has grown from a mere brokerage office for the purchase of space to a technical bureau which plans selling campaigns and writes and executes the advertising copy. In fact, many of these organizations now specialize in a single field of advertising, while others are so extensive and so comprehensively organized that

they are able to supply service to a wide range of interests. One of the most interesting developments in this connection is the use of publicity to supplement paid advertising. Free publicity before the War was used chiefly by theatrical press agents, who were successful in creating news "stunts" for their stars. During the War, all the relief and welfare agencies maintained publicity bureaus informing the newspapers of their activities, and this practice was speedily imitated by private industrial organizations. In the latter case, it was not always easy to make out a legitimate news interest, and editors put themselves on guard against printing as news what was obviously private propaganda. Large amounts of such copy do get into the newspapers, however, inasmuch as the line between private interest and public interest is not always easy to draw. Publicity cannot be used to sell merchandise, but it can create a favorable atmosphere, which big corporations regard as invaluable.

Today, departments of public relations are a feature of practically all large corporations, and even educational, philanthropic, government, and other organizations. They aim to bring before the people at large the activities and viewpoint of the interests they serve. Often, they seek publicity for scientific work carried on by their research laboratories and they endeavor to present the range of interest and organization of their corporations. Such advertising and publicity are not confined to competing interests, but are found advantageous by monopolies.

In this connection, it may be said that in the United States a recent commercial development has been severe and distinct competition not merely between those engaged in a single line of business, but between entire industries, as for example steel against wood, and concrete against brick. In such cases cooperative advertising through trade associations or industrial groups has been developed and not only skillful advertising writers and press agents are employed, but campaigns developed where attractive and convincing printed matter is distributed in the interest of the industry and the material it manufactures rather than to advance the product of any single firm.

The development of financial advertising, especially by banks and trust companies, has marked the growth and consolidation of these large institutions. Trust service, both corporate and personal, custody service, security departments, safe deposit vaults, foreign exchange, and letters of credit, are but a few of the functions of these banking institutions which are brought to the attention of the public through large and conspicuous advertisements in newspapers and magazines. This advertising also involves the presentation of periodic financial reports and notices of elections or other matters of records designed to keep the companies and their activities in the public eye. Financial advertising naturally has become not only elaborate, but specialized and with it has gone the preparation of various kinds of booklets replete with informative matter.

Likewise, in the sale and renting of real estate, special advertising is arousing increased attention and here, too, there have been elaborate developments in placing facts before possible customers in their most attractive light.

Another field of specialized advertising, important not only in its extent but in its char-

acter, has been that of the motor vehicle. No small amount of the vogue of this necessary machine has resulted from elaborate advertising carefully planned in which all of the various methods of bringing the attention of cars, tires, and other adjuncts to prospective purchasers have been utilized. In fact, advertising figures in the selling expense to a marked degree, but at the same time it has developed the world markets which the motor vehicle enjoys.

Railway and steamship advertising has been developed on a higher and more useful plane with unquestioned economy to the transportation companies as the various mediums employed are carefully considered and tested. There has been improvement not only in the use of newspaper and magazine space, but in the publicity material gratuitously distributed. Today travel advertising is world-wide and in many languages so that an American is informed not only as regards routes, hotels and commodities in his own country and Europe, but also in Asia, Africa, and South America. This is done not only by transportation companies and hotels, but on an elaborate scale by various states who employ skilled publicity directors for such activities and circulate elaborately illustrated material.

A natural result of extensive advertising has been to increase the size of the more extensively employed newspapers and magazines as there must be maintained an appropriate proportion between reading matter and advertising. Increased advertising not only acts for increased reading matter, but as the circulation increases in amount and character, the returns to the publisher are greater so that he is able to secure more expensive contributions and features; conversely, of course, the better the magazine and the greater its circulation, the more valuable an advertising medium it becomes.

A recent development in advertising has been the use of radio-broadcasting where a corporation will acquire the facilities of a broadcasting organization for a certain specified time during which it will present by spoken word or by music some programme of general interest with incidental reference to the advertiser as the source of the entertainment feature.

The airplane has been employed in advertising using the wings for painted words or letters outlined in colored incandescent lights. Skywriting where the aviator traces a message in the air by a smoke trail is employed, as well as circulars distributed from the sky.

The attempt to apply the methods of experimental psychology to advertising has been for the most part abandoned. Whatever relation advertising has to psychology is seen to belong rather to the empirical psychology of motives, the psychology that is practiced by interpreters of human nature whether they be historians, philosophers, or novelists. In advertising, the recognized principle is to associate a strong sentiment with the prosaic announcement of the goods to sell. The use of this principle is open to many moral objections, and it may become more and more necessary for society to legislate against its too enthusiastic application. But as things stand, it is part of the economic system and the necessary competition for public attention.

With the growth of advertising as a profession, special steps have been taken to eliminate as far as possible improper methods. Prominent in this activity are the advertising clubs, which



bring together the advertising writers of the United States and England in a common federation. These clubs spread the slogan "Truth in Advertising" and endeavor in other ways to standardize practices. This is reinforced by the action of certain advertising mediums which maintain definite standards for their columns and reject copy that fails to comply on the score of accuracy of statement, nature of goods advertised, or general reliability. Certain trade associations, stock exchanges, and other groups have adopted ethical and other standards of advertising which their members must not transgress.

Consult Frank Presbrey, *The History and Development of Advertising* (New York, 1929).

A.E.F. See WORLD WAR; ARMIES AND ARMY ORGANIZATION.

**AERONAUTICS.** If one were to exclude the actual invention of the heavier-than-air machine for mechanical flight and its early practical development, it might be said without fear of contradiction that the period following the World War was the most momentous in the history of aerial navigation. In these years, not only was mechanical flight reduced to practice, but it has become a method of transportation which now has to be seriously considered.

Our consideration will take up first the spherical balloon or aërostat, where naturally there has been but little advance save in the use of better fabrics for the gas container, as the utility of this device was limited. Except for flights, rather of a sporting nature, or to test the air currents, spherical or freely flying balloons have had a narrow field of usefulness. Secondly, the airship can be considered, for it reached a point where it was able to cross the Atlantic Ocean, not to mention its use as a serious engine of war for purposes of demolition when not opposed. Third in order will be discussed the various types of heavier-than-air craft, such as airplanes, seaplanes, and helicopters.

**Spherical Balloons and Balloon Racing.** During the War, there was little opportunity for the use of spherical balloons by the belligerents. For observation, the captive kite or sausage balloon was used, as it was more suitable for observation purposes owing to its greater stability than the spherical balloon. Accordingly, activity in this department was not resumed until in 1919, when the annual balloon race in the United States again was held. On Oct. 2, 1919, this competition was resumed at St. Louis, with entries from 10 American cities. This competition became known as the National Elimination Balloon Race and is held annually. It serves to select the American competitor and alternates for the annual Gordon Bennett Balloon Trophy Race which is held in the country of the winner of the previous year's competition. The competition is to determine the greatest distance to be flown by any of the contestants. In 1927 the National Elimination Balloon Race was held at Akron, Ohio. This contest was won by the *Goodyear Tire & Rubber Co. V.*, piloted by W. T. VanOrman, and W. W. Morton, the distance covered being 718 miles. Second place was won by the Detroit Flying Club Entry No. 3., with a distance of 650 miles, and third place was taken by U. S. Army Air Corps S-261, with a distance of 595 miles.

The National Elimination Balloon Race held from Bettis Field, Pittsburgh, on June 30, 1928, was won by Capt. W. E. Kepner with Lieut. Wm. O. Eareckson as aide. Due to stormy

weather, most of the balloons were brought down very close to Pittsburgh, and the distance credited to Captain Kepner, of 261.5 miles, was the shortest which had ever won this racing event. The National Elimination Balloon races of 1929 were accompanied by rain, sleet, and wind storms. Several of the balloons were badly weighted down with ice, and made but short flights. Lieut. T. W. G. Settle with Ensign Wilfred Bushnell as aide established a record in this event by landing at Charlottetown, Prince Edward Island, a distance of 900 miles from the start at Pittsburgh.

**Gordon Bennett Competition.** In 1920 the annual international balloon race for the Gordon Bennett Trophy interrupted by the War was resumed. The United States was then the trophy holder, so that the start was made from North Birmingham, Ala., on Oct. 23, 1920. Eight large spherical balloons participated, filled with by-product coke gas from the Sloss-Sheffield Steel Iron Co. furnaces. From this time, this annual international air competition has been held regularly in different countries, but without improving on the record of 1887.6 kilometers, or 1172.9 miles, made by Augustus Post and A. R. Hawley, Oct. 17-19, 1910; this was also the American record for distance for the spherical balloon up to 1924.

The race for the year 1923 was marked by very severe storms, with high winds, rain, and electrical disturbances. Six balloons were destroyed or badly damaged, and considerable discussion of the rules was caused by these misfortunes, as the rules did not at that time permit postponing the race because of unfavorable weather conditions. Good weather attended the races in 1924, but several of the balloons were forced to descend to prevent being blown out over the Atlantic ocean. This race was won by Lieut. Ernest de Muyter of Belgium in the *Belgica*.

The 1927 Gordon Bennett Race was started from the Ford Airport, near Dearborn, Mich., on September 10. There were 15 balloons entered in this race, representing eight countries. The Detroit Flying Club's entry, piloted by E. J. Hill, with A. G. Schlosser as aide, won this event with a distance of 744 miles. In the International Race for the Gordon Bennett Trophy, held at Detroit, June 30, 1928, Capt. W. E. Kepner covered a distance of 406.9 miles, and in so doing won for the third consecutive time for the United States the James Gordon Bennett Trophy, securing its permanent possession. Of seventeen races held for this trophy, seven have been won by the United States, five have been won by Belgium, two each by Germany and Switzerland, and one by France.

**Balloon Records.** None of the previous flights exceeded the record for duration made by H. Kaulen of Germany on Dec. 13-17, 1913, of 87 hours, or that for distance made by the German, Berliner, on Feb. 8-10, 1914, of 3052.7 kilometers (1896.9 miles), while for altitude Suring and Berson on June 30, 190, reached a height of 10,800 meters (35,424 feet).

The International Aeronautic Federation (F.A.I.) makes a distinction of class for spherical balloons, grouping in the first category those up to 600 cubic meters capacity, in the second category those from 601 to 900 cubic meters, and in the third category, from 901 to 1201 cubic meters. Up to 1929, the International Federation's records for duration and distance were, for balloons of the first category

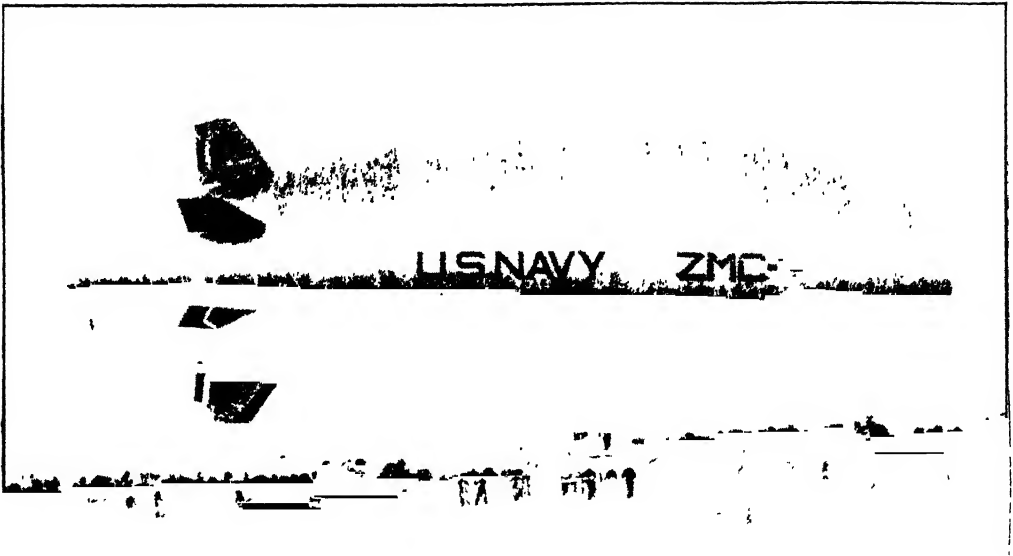
# AËRONAUTICS



*P. & A. Photo*

THE GERMAN AIRSHIP, "GRAF ZEPPELIN," OVER PERTH AMBOY, N. J.

## AERONAUTICS



*Courtesy Detroit Aircraft Corporation*

**ALL-METAL DIRIGIBLE ZM-2  
MADE OF ALUMINUM ALLOY, 150 FEET IN LENGTH, 50 FEET IN DIAMETER**



*Courtesy Pittcairn-Cierva Autogiro Co.*

**CIERVA AUTOGIRO IN FLIGHT OVER BRYN ATHYN, PA.**



as follows: duration (France), George Cormier, 22 hours, 34 minutes, Aug. 10-11, 1924; distance (France), George Cormier, July 1, 1922, 804.173 kilometers (499.69 miles).

**The Zeppelin Airships.** In the field of the rigid airship, the work of Zeppelin done before the War on a systematic basis looking not only to military applications but also to use in commercial air travel and transportation was significant and had an important bearing. In 1913, 10 Zeppelin airships were in service in Germany, and others were being built for the military or naval service. Of the latter, two of the larger craft were destroyed accidentally in 1913. At the outbreak of the War there were three Zeppelins, each of 15,000 cubic meters capacity (19,619 cubic yards; 530,000 cubic feet) in the German Navy. With manufacturing facilities previously developed, it was possible straightway to proceed with further construction, following essentially the same designs but increasing capacity and motive power and improving equipment of the craft. The greater capacity naturally was required for explosives, incendiary, and other bombs which were dropped in the course of raids on enemy territory.

It was stated that the total number of German Zeppelins by the end of the War was 67, of which 17 were lost in action with the enemy, 34 were accidentally destroyed, and six were captured. This statement shows clearly the hazards incidental to the operation of airships. In fact, when the French and British air squadrons were well organized and the defense measured up to its full strength, it was impossible to employ the Zeppelins on the western front or even in air raids over Great Britain.

By the terms of the Versailles Treaty (1919), the Germans surrendered all their remaining airships to the Allies, and their development work was hindered for several years. Excepting for the construction of the *ZR-3* for the United States Government, no rigid airship was built until the *Graf Zeppelin* in 1928.

**Graf Zeppelin.** The flight of the *Graf Zeppelin*, beginning in Friedrichshafen in South Germany and ending at Lakehurst, N. J., Oct. 15, 1928, may be considered one of the outstanding accomplishments of aeronautical history. On the trip from Germany, a non-stop flight of 6100 miles was made lasting 112 hours. Aboard were 60 persons, and during this long trip food, water, and relatively comfortable accommodations were provided for everyone. Rough weather damaged the right horizontal fin, cutting down the speed of the craft considerably, but this was repaired at Lakehurst and the return flight to Germany with 25 passengers and 40 in the crew, was accomplished in 71 hours and 12 minutes. A trip begun in May, 1929, was interrupted by engine trouble and failure, requiring the *Graf Zeppelin* to put about and descend at the French aerodrome near Toulon. On July 31, however, the *Graf Zeppelin* left Friedrichshafen at 9.29 Eastern Standard Time, and after a successful trip reached Lakehurst at 6.29 P.M., landing at 8.52 P.M., and being in the air 95 hours 23 minutes. The return trip started from Lakehurst at 11.39 P.M., August 8, and was accomplished in 48 hours 52 minutes, making a new record. The airship then set out on a trip around the world which was made in 21 days 7 hours and 31 minutes, reaching Lakehurst on August 29.

The main frames of the *Graf Zeppelin* are 23-sided polygons, spaced 15 meters (49.21 feet) apart, with two auxiliary frames between each pair of main frames. The frames and longitudinal members are of triangular section, the booms of all members being of a hollow circular section. The four bottom sides of each polygonal frame are reinforced by a steel framing system. The *Graf Zeppelin* has an overall length of 772 feet, a maximum diameter of hull of 100 feet, a cubical capacity of 3,710,000 cubic feet, and was designed for a gross lift of 107 tons, with a payload of 15 tons in addition to a crew of 26 and fuel for cruising 6200 miles at a speed of 68 miles per hour. The *Graf Zeppelin* was the first airship to employ gaseous fuel, 1,200,000 cubic feet of "Blau" gas being taken on at Lakehurst for the return trip to Germany. The power plant equipment consists of five 12-cylinder, 550-horse-power Maybach-Zeppelin engines, each motor being housed in a separate power car slung beneath the hull. At full throttle, a speed of 78 miles per hour could be attained.

**British Airships.** Previous to the War, the dirigible balloon had aroused little interest in Great Britain, and even in 1915 the British government decided that they were not worth building, principally on account of the inflammability of the hydrogen gas, which could be readily ignited by an incendiary bullet from an airplane. The British government did build in 1916 a series of non-rigid and semi-rigid airships, largely for observation purposes. In 1918, when it was realized that there could be made available helium in quantity, it was decided to build a fleet of rigid airships which would be safe from dangers of explosion or fire. Accordingly, with experience derived from the War and particularly from a study of captured Zeppelins which had been brought to earth, including the *L33* which had been brought down in England, Sept. 23, 1916, there was designed in England before the Armistice, a type of airship which not only would be suitable for a transatlantic trip, but would be able to carry large amounts of high explosive.

Inasmuch as the British had suffered severely from the Zeppelins, they sought to make these craft, eight of which were projected, as efficient as possible. None was completed before the Armistice. The *R34*, put into commission in 1919, made the first transatlantic flight by an airship. Unfortunately, this craft ran aground and was destroyed, Jan. 28, 1921, during night flying in Yorkshire. Another of the group, the *R38*, was purchased by the United States government and was preparing for an oversea trip to America when it was wrecked in the air, and almost the entire crew of British and American officers and men perished. The *R36*, on June 10, 1921, had a successful endurance test; it was 30 hours in the air on a trip from Fulham to Land's End and back. The *R80*, the *R34* and the *R38* all were completed, or practically completed, by 1920. The *R80* had a volume of 1,250,000 cubic feet and a length of 530 feet, as against a volume of 1,980,000 cubic feet and length of 643 feet for the *R34*, and a volume of 2,720,000 cubic feet and a length of 693 feet for the *R38*. The *R34* scored the first transatlantic flight for an airship, leaving East Fortune, near Edinburgh, Scotland, at 2 A.M., July 2, 1919, and, flying by way of Newfoundland, arrived at Roosevelt Field, Mineola, N. Y., at 9 A.M., July 6, 1919. A return trip was made even

more successfully, leaving New York on July 9, and reaching Great Britain on the morning of July 12, a distance of 3200 miles in 75 hours and 3 minutes, or a total flying time for the *R33* of 183 hours and 15 minutes for some 7000 miles on this transatlantic trip. This achievement was notable in that the airship experienced fog, heavy squalls, thunder-storms, and head winds, and indicated the possibilities of transatlantic flight on a commercial scale.

The British airships, *R100* and *R101* built later, have a volume of about 5,000,000 cubic feet. The *R101* is approximately 730 feet long, and has a maximum diameter of a little more than 130 feet. Over the greater portion of the length, the section is a polygon of 15 sides, changing to a section of 16 sides at the tail. In some respects, there has been a radical departure from conventional airship practice in the design of the *R101*. Steel has been used in preference to light alloys for all of the more heavily stressed components of the frame. The transverse frame rings have no radial wire bracing, but are designed to have sufficient stiffness without such aid. The frame members are jig-built, require no fitting in place, and are easily removable in case of damage. These airships are notable in that they are designed for commercial instead of military use. Great care has been taken to make the passenger accommodations the utmost in comfort.

**United States Airships.** Before the United States entered the War, several small airships had been secured for the Army and when it was decided to participate actively in the conflict, a number of nonrigid dirigibles of the "blimp" type, the first of which were tested in May, 1917. By 1919, a useful American airship had been developed of which the *O5* was a representative. This nonrigid airship was 192 feet in length, 43 feet wide and 45 feet high, with a capacity of 180,000 cubic feet of gas. It had a cruising speed of 42 miles an hour and in May, 1919, made an attempt to cross the Atlantic by way of Halifax. A distance of 1050 miles was accomplished successfully, but a heavy gale arising, the airship was driven from its moorings and carried out to sea, where it was destroyed.

The United States War and Navy departments, however, had manifested an interest in still larger airships, as they seemed to possess for the United States a considerable field of usefulness. In addition to the airship ordered from the British and a Zeppelin to be secured under the Treaty of Versailles, the American government put under way still another airship of the rigid type, but following the lines of the German Zeppelin *L49*, captured intact in France during the War, and supposed to represent the best efforts of the German designers.

**United States Airship "Shenandoah."** It was decided to construct this airship, originally known as the *ZR1*, and its engines entirely in the United States, using the Philadelphia aircraft plant of the United States Navy for the fabrication with assembly at the large hangar at Lakehurst, N. J. While the airship was based on the Zeppelin designs, these were not followed absolutely, and improvements were introduced wherever possible. The craft as designed was 677.49 feet in length and 78.74 feet in diameter, with a height of 93 feet. There were 20 gas cells, or balloonettes, inside the frame and fabric, with a total capacity of 2,115,000 cubic feet of buoyant

gas. The airship weighed 76,000 pounds without fuel, supplies, or crew, and was able to carry a load of from 30,000 to 50,000 pounds of fuel, supplies, crew, etc., depending on whether helium or hydrogen was used and the degree to which the airship was inflated. A crew of 20 to 25 officers and enlisted men was required.

The *ZR1*, christened the *Shenandoah*, when it went into commission on October 10, 1923, was the first airship of Zeppelin type to be filled with helium gas, and in September, 1923, it made a very satisfactory trial flight from the naval air station at Lakehurst, N. J., followed by several extended and successful trips.

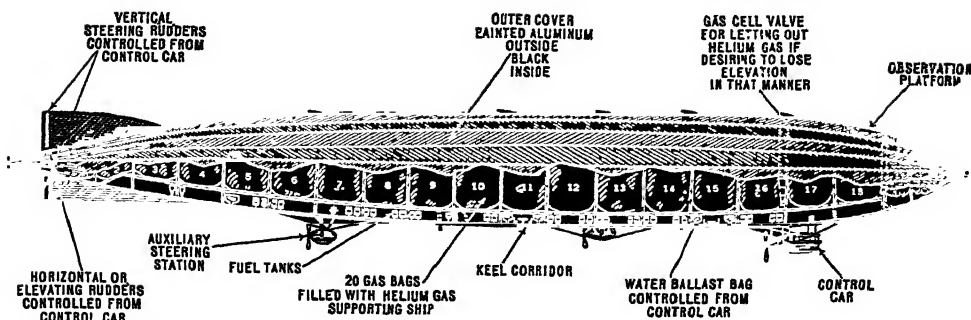
During the spring of 1924, in addition to the repairs occasioned by her breaking loose from the mooring mast, improvements were made, and five engines instead of six were installed. The engine formerly located in the after section of the control car was removed, and a new specially constructed long-range radio sending and receiving set was installed in its place. Various flights were made and during a wind storm on Sept. 3, 1925 the *Shenandoah* was completely wrecked in Noble County, Ohio, and 14 members of the crew including Lieut. Commander Zachary Landsdowne, U. S. N., lost their lives.

**United States Airship "Roma."** The United States government in the autumn of 1921 purchased from Italy a large semi-rigid airship named the *Roma*, which with a capacity of 1,200,000 cubic feet and a length of 410 feet was stated to possess a range of action of approximately 3500 miles at 80 miles per hour, and had at cruising speed a range of 8000 miles. This airship was shipped to the United States and assembled at Langley Field, Virginia. The six 12-cylinder 400-horse-power Ansaldo motors received from Italy were later replaced with Liberty motors, and flights were made with fair success until Feb. 21, 1922, when, flying near the army base at Hampton Roads, Va., the craft was forced to earth through the failure of the rudder with its vertical controls. The metal-clad nose of the airship came into contact with high-tension electric-power wires, and immediately the gas bag was ignited. With the exception of those members of the crew who were able to jump, those on board were burned to death. The casualties included 13 officers and 21 non-commissioned officers, privates, and civilians.

**United States Airship "Los Angeles."**

The United States Navy had determined to make a thorough test of dirigibles, and in 1921 the Allied Council of Ambassadors in Europe agreed to permit the Zeppelin works in Germany to build for the United States on the reparation account a commercial airship of the *L90* type, with a gas capacity of 2,475,000 cubic feet. This permission was essential as in the protocol signed in June, 1919, 30,000 cubic meters (1,059,000 cubic feet) maximum capacity had been made the limit for the largest rigid airship that Germany was permitted to construct.

The Zeppelin airship thus constructed for the United States, known at first as the *ZR3*, was a commercial type, as it was stipulated that even a reparations ship must be used only for commercial purposes. It was 650 feet long, 90.75 feet in diameter, and 101.8 feet high from the floor of the control car to the top of the hull. The cruising speed ranges from 45 to 71 miles an hour, affording a radius of action of some 5000 miles, as compared with 4000 miles for the *Shenandoah*. There are five Maybach engines,

THE U. S. S. *Shenandoah*

Showing the details of assembly and the disposition of the various parts of the navy constructed rigid airship. The *Shenandoah* was wrecked Sept. 3, 1925.

directly reversing without gears, each of 400 horse power, installed in cars suspended close to the keel. The gas capacity is 2,475,000 cubic feet, and a gross lift of approximately 150,000 pounds is afforded, 60 per cent of it useful load, including passengers, fuel, supplies, etc. The control car includes the passenger cabin, supplied from an adjoining electric kitchen, a radio and engineer's room, and forward, the navigator's cabin. The passenger quarters accommodate 30 with berths similar to those of a sleeping car, and a crew of 30 men is required.

Completed in 1924 and successfully brought to the United States, *ZR3* represented the best work of the famous plant of Friedrichshafen of that time. In May 1925, the *ZR3*, rechristened *Los Angeles*, made a flight to Porto Rico and return, a distance of 4000 miles. In February, 1928, after four years of service, during which many flights were made, the *Los Angeles* made a non-stop flight to Panama, 2178 miles in 40 hours, again demonstrating the potential usefulness of airships in commercial and military work.

**New United States Airships.** In October 1928, contracts for the construction of two Zeppelins for the U. S. Navy were awarded to the Goodyear Zeppelin Corporation, the contract price for the two being \$7,825,000. The specifications called for the construction of the frame of duralumin with steel-wire bracing. Air resistance will be cut down by putting the control, passenger cabins, and space for carrying five scouting airplanes within the streamline of the hull. These airships are nearly three times as large in cubic contents as the *Los Angeles*. Comparison of the principal characteristics of the new ships with the *Los Angeles* are given below.

	<i>Los Angeles</i>	<i>ZRS4</i>
Nominal Gas Volume, cu. ft.	2,470,000	6,500,000
Length over all, feet	658.3	785
Maximum diameter, feet	90.7	132.9
Height over all, feet	104.4	146.5
Gross lift, pounds	152,000	403,000
Useful lift, pounds	60,000	182,000
Number of engines	5	8
Total horse power	2,000	4,480
Maximum speed, knots	63.5	72.8
Range without refueling at 50 knots cruising speed in nautical miles	8,500	9,180

**Helium for Airships.** In view of many serious accidents caused by the ignition and explosion of the hydrogen in the gas containers of

airships, unusual interest attached to the development during the War of a process and plant for the production on a commercial scale of a substitute for hydrogen, in the form of helium. The gas helium was next lightest to hydrogen, but was not inflammable or susceptible to ignition from an electric spark or incendiary projectile, and at the same time it was most inert. Its production in bulk was accomplished by the United States government at Fort Worth, Tex., using the oil from certain wells in Texas and Oklahoma and separating the helium from the other gases by a complicated refrigerating process. This plant and process were developed so that on Dec. 1, 1921, the United States Navy nonrigid airship *C7* was successfully inflated with gas thus produced and made a number of trips, and later the *Shenandoah* also was inflated with the gas. Helium is noninflammable and is nonexplosive, but it has 92 per cent of the lifting power of hydrogen, and accordingly for the same gross lift would require an airship of 10 per cent greater volume. By 1924 the United States was able to produce sufficient helium to fill two such airships as the *Shenandoah* which used the gas successfully on all its trips.

**Development of the Airplane.** From the time of the first flight by Wilbur and Orville Wright, Dec. 17, 1903, up to the beginning of the World War in August, 1914, there had been a rapid development of airplanes with the result that practical machines were available which could fly under conditions of satisfactory balance and control, and over distances sufficiently great to prove their usefulness. By 1914 there had been developed four fundamental types of heavier-than-air machines: the tractor land plane and seaplane, the latter fitted with pontoons, and pusher land planes and flying boats. With the exception of the Russian Sikorsky plane, which was provided with four engines, all were single-engine machines, England and the United States favoring biplanes, and France and Germany monoplanes. Largely as a result of racing contests, for which substantial prizes had been offered, the French planes of 1914 were the fastest in the world, and at that time the world speed record stood at 125 miles per hour, made by Prévost at Rheims, Sept. 29, 1913, when he flew a Deperdussin plane with a 100-horse-power Gnome engine.

In contrast to the sporting competitions of the French, the Germans had arranged military tests and offered prizes for competitions, where the

of the wing and to them are fastened the wing ribs, which have the exact contour that is desired for the cross-section of the wings. The spacing of the ribs is such that the covering does not sag noticeably between the ribs. In addition to the ribs, the wing is braced in the horizontal plane by internal wires and struts, which with the spars form what is known as the drag truss. The covering of cloth is applied as in the fuselage, but it is generally reinforced at the leading and trailing edges of the wing by being fastened to continuous surfaces of ply wood or metal at these points. It has been demonstrated that wings can be built lighter of aluminium alloys than of wood, but many designers prefer the old construction because of the relative ease of inspection, maintenance, and repair. Corrosion troubles have been encountered in the use of aluminium alloys, especially when operating near salt water and many designers do not like to use these materials in parts of the airplane that cannot be readily inspected.

In all-metal construction, three or more spars are sometimes used instead of the two, and the drag bracing is done away with by the use of corrugated metal covering capable of withstanding the stress. The frames of the control surfaces are often built of small sizes of welded steel tubing but this construction has been used very little in wings.

In commercial monoplanes, the fuel tanks are generally located in the wings as this is the best place for them as regards fire risk and the safety of pilot and passengers in case of a rough landing. Metal propellers, made of either duralumin or steel are rapidly replacing the wooden ones formerly used.

branches of engineering. The strength of almost every part and material entering into a modern airplane is calculated during the course of the design, and actual load tests are applied in many cases to verify the results of the calculations. Materials have been and are being studied as never before in an effort to improve the strength-weight ratio. This applies particularly to engine manufacture.

**Engines.** The development of aircraft has gone hand in hand with the improvement of internal combustion engines. The aim has been always to secure greater power, reliability, and economy, and at the same time to reduce the unit weight of the power installation as compared with the horse power developed. The development in this field from 1903 to the present is shown by the accompanying table where the values of the outstanding airplane engines for each year are given. In 1903 the figures are for the Wright motor and the 1918 figure for horse power, 450 pounds, is that of the Liberty motor. In this, it will be noted, a ratio of 1.8 pounds per horse power was achieved.

Considerable improvement has been made since 1918, chiefly in reliability, but also in reduction of weight. In 1928 water-cooled engines of the type and size of the Liberty weighed about 1.5 pounds per horse power dry. In air-cooled engines, the Pratt & Whitney Wasp of 400 horse power weighed 1.67 pounds per horse power. Among the larger engines, a very low weight has been achieved, 1.15 pounds per horse power in the 1200-horse-power water-cooled Packard 1A-2775, and 1.50 pounds per horse power in the Curtiss Chieftain, which is a 600-horse-power hexagonal air-cooled type.

Year	1903	1910	1914	1915	1916	1917	1918	1920	1924	1927
Horse power	21	54	112	133	185	243	450	600	800	1,300
Weight (lbs.)	152	309	437	512	570	693	825	1,118	1,160	1,500
Lbs. per horse power	12.7	5.7	3.9	3.8	3.1	2.8	1.8	1.86	1.45	1.15

Landing gears are built in several forms and always involve some form of shock-absorber device such as the rubber cord shock absorber, the oleo and the oleo-pneumatic. In addition to absorbing the shock of landing, the chassis must permit of "taxying" on the ground without too much discomfort to the passengers. In the oleo gear, a telescoping tube device is used in which oil is forced through an orifice, as the overall length of the tubes shortens, thus acting as a spring without rebound. In the oleo-pneumatic type, air is compressed at the same time and a slight rebound is experienced. Practically all landing gears are of the split-axle type, that is, of a type having separate wheels with no through axle. While this construction is somewhat heavier than the older form, it offers less air resistance and less danger of tripping up when landing or taking off of a rough field.

Seaplane floats and flying-boat hulls are built of all wood, all metal, and of a composite construction. The latter form finds the greatest favor in the United States, while in Germany, the tendency seems to be more strongly toward the use of metal entirely both in float construction and in the structure of the airplane and its covering.

To meet the exacting requirements of strength with low weight, designers of aircraft have been compelled to develop or adopt refinements in calculations of the strength of parts to a degree considerably beyond the requirements in other

Because of the relatively little advantage gained by further reducing the weight of the power plant, recent development has been in improving reliability, and has shown no rapid decrease in weight. That reliability had been attained was demonstrated in an endurance flight record of 420 hours 21 minutes and 30 seconds made in July 1929 at St. Louis, Mo., at the end of which time the engine was still functioning perfectly. Refueling had taken place 48 times in this flight.

**Liberty Engine.** The Liberty engine, which was used as late as 1929, when it became obsolete in the military service, is worthy of passing comment as a war-time attempt by the United States to produce on a quantity basis a new design in which all the best features of the various engines used in the airplanes of the combatant nations would be incorporated and which could be manufactured immediately in quantity. At the request of the Aircraft Production Board, C. J. Vincent of the Packard Co. and E. J. Hall of the Hall-Scott Motor Co., made a preliminary design in 24 hours which met with the Board's approval, and with the aid of a group of skilled motor-car engine designers, layouts of the engine were completed in one week. In two weeks, detail drawings were 89 per cent complete, and in 35 days after the project had been first undertaken, an engine was completed and delivered to the U. S. Bureau of Standards laboratories at Washington.

By 1918 the engine was in quantity production; an output of 3878 motors was secured in that year. These motors were used not only for American airplanes in the closing months of the War but were supplied to the French, British, and Italian machines. The object of the Liberty engine was to combine high power with lightness, and the 12-cylinder motor was developed, in which the best features of American and European types were combined in a single efficient machine.

Notwithstanding that vast numbers of Liberty engines were available after the close of hostilities, there was no tendency on the part of American aviation engineers to remain satisfied with their design and many new types were developed. An interesting type was the Curtiss D 12 engine, which was employed with great success in planes participating in the Pulitzer, Schneider, and other competitions in 1922 and 1923, and demonstrated its usefulness as an engine for a small high-speed airplane, single-seater, fighter, or scout, such as the Curtiss and Boeing pursuit planes, or for a two-seater fighter. There was a V-arrangement of the twelve cylinders which were water cooled, and the entire engine weighed 670 pounds dry, requiring 44 pounds of water. This engine gave 400 brake horse power at 200 revolutions per minute. In connection with this engine was employed a wing type of radiator where two sheets of brass, one flat and the other corrugated, were soldered together and fastened to the surface of the near wing. The water flowing from edge to edge of the wing and through the corrugations of the two sheets is cooled in its passage. The wing-type design eliminates the resistance of the former core type of radiators which interfered with the attainment of the highest possible speed. In the wing-type radiator, the flow of water to each section can be controlled by the pilot; this makes it possible to eliminate any section when desired on account of leakage.

The Bureau of Aeronautics of the U. S. Navy in 1923 decided on a radical innovation in abandoning definitely the use of water-cooled engines of less than 300 horse power in naval aircraft construction. This action was taken as a result of the success of the Lawrence-Wright J1, a 200-horse-power air-cooled engine. A new model of this engine, the J3, affording 200 horse power at 1800 revolutions per minute, became standard equipment for certain types of naval aircraft. This work was continued and resulted in the Wright Whirlwind engine made famous by the Lindbergh flight, and the other notable flights of 1927.

The Wright Whirlwind engine was of the nine-cylinder static radial air-cooled type, having a bore of 4.5 inches, and a stroke of 5.5 inches, a total displacement of 788 cu. in. and developed 220 horse power at 1800 revolutions per minute. The crank shaft had only one throw, and revolved on roller-and-ball bearings. Connection was made to this single throw by means of a master connecting rod and eight articulated rods. The cylinders were of steel with integral fins, and the aluminum alloy heads were screwed and shrunk in place. The valves were placed in the head, on aluminum bronze seats. Tungsten or cobalt chrome steel was used for the exhaust valve, and high tungsten steel for the inlet valve. The valves were operated by push rods and rocker arms from four-lobed cams concentric about the crank shaft. Two Scintilla

magnetos were mounted on the front of the engine, the induction system and auxiliaries on the rear.

This type was replaced in 1928 by a series of similar engines ranging in power from 150 to 300 horse power. Weight was reduced without sacrificing reliability, and several refinements were made in the arrangement of the auxiliaries. Incorporation of a stream-lined exhaust collector ring and a shutter to control the flow of cooling air as standard equipment were outstanding improvements.

The Pratt & Whitney Aircraft Co. have specialized in air-cooled engines of large size. These, like the Wright Whirlwind, were 9-cylinder static radials, differing from the Wright design by having a solid master connecting rod and a two-piece single-throw crankshaft. The Wasp, rated at 425 horse power at 1900 revolutions per minute, and the Hornet, rated at 500 horse power at the same speed, are produced by this company for both military and commercial use.

The year 1928 was marked by tremendous activity in the aircraft-engine field, many new models being introduced, and several innovations. Many of the large engines were geared, this construction appearing in the air-cooled types as well as in the water-cooled. Great progress was made in the refinement of the aerodynamic design of air-cooled engines, the line type being particularly favored in the small outputs. Development was being carried on with the V in the larger air-cooled motors, while the Curtiss Company manufactured a two-bank radial engine combining the advantages of the line and radial types. The development of a new form of cowling for radial engines by the National Advisory Committee for Aeronautics marked a great step forward, showing increases in top speed as great as 10 miles per hour in some instances.

Further refinement of the water-cooled engines was mostly in the introduction of cooling fluids permitting operation at higher temperatures than formerly. Of various cooling fluids used, ethylene glycol (this is one of the popular brands of automobile anti-freeze solutions) showed the best results. This allowed operation at outlet temperatures of 300° F., with a corresponding large decrease in radiator. This gives a twofold advantage, first a large reduction in parasite resistance, and second, an appreciable reduction in weight. Approximately one-fourth the radiator area is required as that for water. Also, the small size makes wing-skin radiators practicable for other than racing planes, giving still further improvement in performance.

**Passenger accommodation in the Airplane.** In the early development of commercial aviation in the United States, by far the greatest portion of the business was mail, express, and valuable freight. This naturally resulted in but little attention being paid to comfort of passengers. With the increasing passenger traffic, there has been a rapid improvement in passenger accommodations. Much work has been done to deaden the sound of the engines, both in sound-proofing the cabins and in silencing the motors. Cabins are larger and roomier than heretofore, and adequate ventilation is provided. Even the smallest passenger transports overlook no details of passenger comfort. Many luxurious air yachts have been constructed for private and business use. Some concerns have planes with full office equipment for transporting executives. In general, the im-



provement in passenger accommodations has been one of the outstanding advances of recent years.

**Typical Airplanes.** Among the many airplanes available, the trend may be appreciated by the accompanying specifications of typical modern American machines:

**Curtiss Robin.**—A 3-place cabin monoplane, powered with a Curtiss OX-5 engine of 90 horse power; span, 41 feet; length, 25 ft. 9 in.; height, 7 ft. 10 in.; wing area, 245 sq. ft.; weight, empty, 1480 lb., loaded, 2217 lb.; high speed, 101 miles per hour; landing speed, 46 miles per hour; normal range, 600 miles.

**Fairchild 21.**—A 2-place, open cockpit, low-wing monoplane, with Genet 80-horse-power engine; span, 28 feet; length, 22 feet; height, 4 ft. 10½ in.; wing area, 139 sq. ft.; weight, empty, 755 lb., loaded, 1250 lb.; high speed, 105 miles per hour; landing speed, 40 miles per hour; normal range, 700 miles.

**Mahoney-Ryan B-1.**—A 5-place cabin monoplane, with Wright Whirlwind 200-horse-power engine; span, 42 feet; length, 27 ft. 5 in.; height, 9 ft. 10 in.; wing area, 290 sq. ft.; weight, empty, 1870 lb., loaded, 3300 lb.; high speed, 126 miles per hour; landing speed, 49 miles per hour; cruising range, 700 miles.

**Keystone Patrician.**—A 20-place cabin transport monoplane, with 3 Wright Cyclone engines of 525 horse power each; span, 90 feet; length, 63 feet; height, 13 feet; wing area, 1000 sq. ft.; weight, empty, 8505 lb., loaded, 15,000 lb.; high speed, 151 miles per hour; landing speed, 57 miles per hour; range, 750 miles.

**Stout 4-AT.**—A 12-place cabin transport monoplane, with 3 Wright Whirlwind engines, 200 horse power each; span, 74 feet; length, 49 ft. 10 in.; height, 12 ft. 8 in.; wing area, 785 sq. ft.; weight, empty, 6200 lb., loaded, 10,000 lb.; high speed, 114 miles per hour; landing speed, 55 miles per hour; range, 540 miles.

**Sikorsky S-38 Amphibian.**—A 10-place cabin amphibian sesqui-plane, with 2 Pratt & Whitney Wasp engines, 400 horse power each; span, 71 ft. 8 in.; length, 40 ft. 3 in.; height, 13 ft. 10 in.; wing area, 720 sq. ft.; weight, empty, 6000 lb., loaded, 10,000 lb.; high speed, 125 miles per hour; landing speed, 55 miles per hour; range, 500 miles.

**Boeing 40-C.**—A 5-place, semi-closed biplane, with 1 Pratt & Whitney Wasp engine; span 44 ft. 2 in.; length, 33 ft. 4 in.; height, 11 ft. 8 in.; wing area, 545 sq. ft.; weight, empty, 3522 lb., loaded, 6075 lb.; high speed, 129 miles per hour; landing speed, 57 miles per hour.

**Prevention of Stalling.** A great deal of attention has been given to averting stalling, probably the greatest cause of airplane accidents. When the angle between the wing and its direction of motion is increased, the lift is increased, until this angle is so large that the flow of air becomes turbulent. This condition, known as "stalling" is accompanied by a marked loss of lift, and will result in disaster if it occurs when the plane is at low altitude. Various devices have been employed to reduce the hazards of stalling. The Handley-Page slot, one of the most successful devices for increasing the stalling angle has been developed in an automatic form. With this device, a slot at the leading edge of the wing opens automatically when the plane reaches the stalling attitude,

giving enough increase in lift capacity to maintain steady controlled flight. Slots also possess the advantage of giving the plane more effective control at slow speed. Devices that require the attention of the pilot have not found favor, and the automatic feature of the Handley-Page slot is its greatest advantage. A rapid increase in the number of planes using this device is expected.

**Aërodynamics.** The progress of aërodynamics since the days of the Wright Brothers has made the design of aircraft and the prediction of performance in advance of construction a science instead of a matter of guess work and hopes. Research work in wind tunnels, carried on in the United States by the National Advisory Committee on Aeronautics at Langley Field, at the U. S. Bureau of Standards, at Wright Field, by the U. S. Army, and at the wind tunnels at New York University, University of Michigan, Massachusetts Institute of Technology, and Stanford University, furnishes the present-day aëronautical engineer with a wealth of reliable information with which he can develop his designs. Several hundred wings of different sections have been tested, so that the designer may select the form that best suits his conditions; and the relative air resistance of the component parts of the airplane have been tested, enabling him better to judge the relative merits of alternative forms of construction. When the airplane is laid out on the drawing boards, a scale model may be built and tested in the wind tunnel to determine any of the characteristics of the design that are desired.

In the operation of the wind tunnel, air is drawn past a model at a speed of from 40 to 100 miles per hour and the forces acting on the model determined by direct measurement. The results so obtained are the same as if the model moved through the air at the same rate that the air in the tunnel moves past the model.

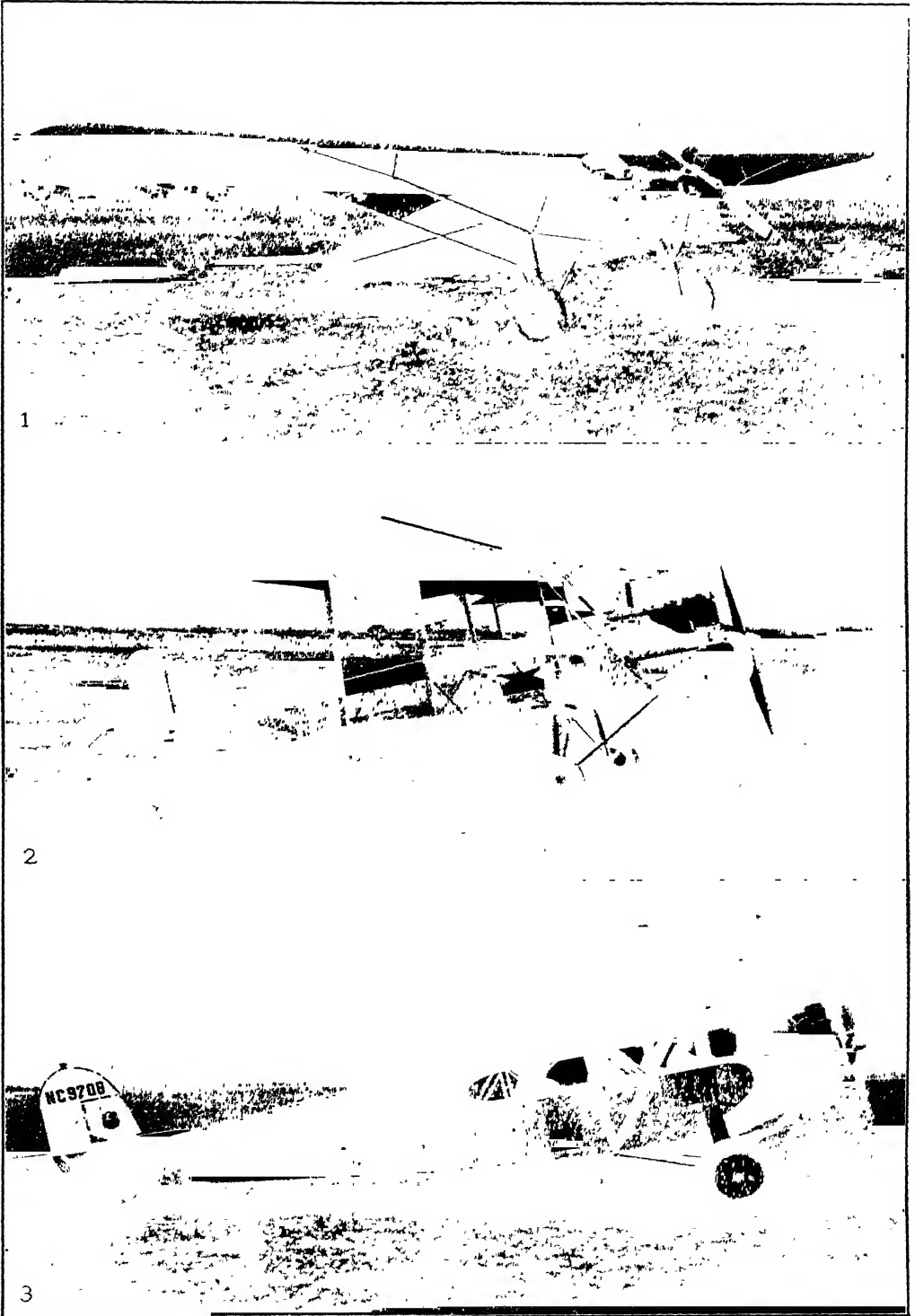
An illustration of the practical results obtained is found in the experiments made on cowlings of air-cooled engines at Langley Field. These tests showed that by merely giving the engine cowlings a proper shape, engine cooling would be improved and the speed of the airplane increased by about 25 miles per hour without any other changes being made.

**The Daniel Guggenheim Safe Aircraft Competition.** In 1927 The Daniel Guggenheim Fund for the Promotion of Aeronautics announced a Safe Aircraft Competition, with the announced object "to achieve a real advance in the safety of flying through the improvement in

#### GUGGENHEIM COMPETITION—MINIMUM REQUIREMENTS

Minimum flying speed	35 miles per hour
Minimum gliding speed	38 miles per hour
Top speed	110 miles per hour
Initial climb	400 feet per minute
Landing run	100 feet
Approach over an obstruction 85 feet high and coming to rest 800 feet from base of obstruction.	
Takeoff	800 feet
Takeoff over an obstruction 35 feet high at a distance of 500 feet from base of obstruction	
Flattest glide	8 degrees to horizontal
Steepest glide	16 degrees to horizontal, with airspeed less than 45 miles per hour.

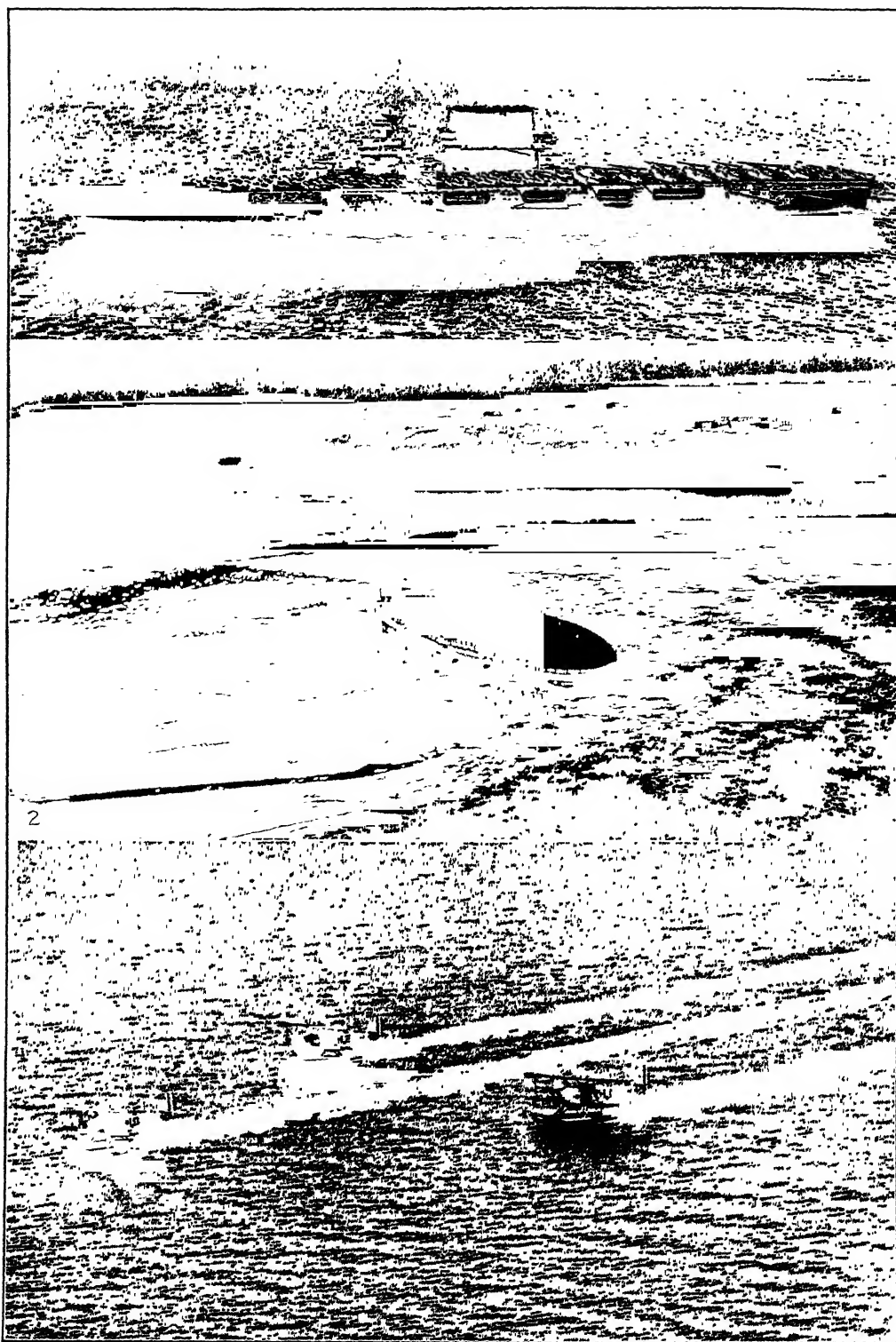
## AËRONAUTICS



### TYPICAL AMERICAN AIRPLANES

1. CURTIS "ROBIN": 3-PLACE CABIN MONOPLANE, ENGINE 170-HORSEPOWER CURTIS "CHALLENGER."
2. WHITTELSEY "AVIAN": 2-PLACE OPEN BIPLANE.
3. FAIRCHILD "71" CABIN MONOPLANE. CARRIES SEVEN PASSENGERS INCLUDING PILOT.

## AÉRONAUTICS



*Official Photographs, Bureau of Aeronautics, United States Navy*

1. UNITED STATES NAVY AIRCRAFT CARRIER "LEXINGTON."
2. UNITED STATES NAVY DIRIGIBLE "LOS ANGELES" ATTACHED TO STUB MAST AT FRANCE FIELD, CANAL ZONE.
3. TORPEDO PLANES TAKING OFF FROM THE WATER.



the aerodynamic characteristics of heavier-than-air craft, without sacrificing the good practical qualities of the present-day aircraft." To insure a definite advance in safety, the rules of the competition require certain minimum characteristics. The rating of the entrants being based on the improvements made over such minimum requirements as are given in the table.

**Motorless Flight.** After the War, considerable attention was paid to airplanes without motors, which were used in soaring flight. These were popularly known as gliders, and so-called gliding contests were held; but this was a misnomer, since the devices were essentially planes or winged contrivances which depended on upward air currents for their power to overcome the force of gravity. A large number of different machines of this general class were developed, and the success obtained by 1924 indicated the possibility of producing inexpensive planes which would require engines with but from 5 to 25 horse power and consequently could be constructed and operated without large outlay. In the second place, a future development might be the employment of towing planes or cargo-carrying motorless airplanes to be hitched to a strong motored plane, in much the same fashion as a trailer to a motor car.

In 1911 Orville Wright made a soaring flight record at Kittyhawk, N. C., remaining aloft 9 minutes and 45 seconds. He started from a sand dune 75 feet high and rose to 230 feet, hovering over the same spot nearly 9 minutes, a record which stood until Dr. Klemperer, a German scientist, built a soaring plane in which he was able to make a 6-mile flight, remaining in the air 13 minutes and 3 seconds, in 1921. Inasmuch as the terms of the Peace Treaty restrict motor-driven flight, students and professors in Germany who had been carrying on aviation studies prior to and during the War now devoted themselves to research and experiment in planes without motors. The record of Klemperer did not last any longer than September 6 of the same year, when it was broken by a student, at the Hanover Technical University, named Martens, who, flying from the Wasserkuppe at the head of the Rhone Valley in Germany, was able to soar for 15 minutes and 40 seconds in a plane designed by Dr. George H. Madelung, then a professor at Hanover.

On Sept. 13, 1921, an aviator named Harth made a flight of 21 minutes and 37 seconds, being able to alight at a spot only 35 feet below his starting point. About this time competitions were held also in France, though, in comparison with the work of German gliders, the showing made was not at all good. In the year 1922, however, some notable German contests were held at the Wasserkuppe, where by this time the local air currents were well understood. A record of 3 hours and 6 minutes was achieved by F. H. Hentzen, while two-passenger gliders were shown, one of which remained aloft for 13 minutes. In November, 1922, a British international contest for gliders was held near Brighton, over the English downs, and was won by Alexis Maneyrol, a French aviator, who remained aloft in a tandem plane for 3 hours and 21 minutes.

In the early days of motorless flight, when dependence was placed on the shifting of the pilot's weight for stability and control, gliding was extremely hazardous; but with modern de-

signs, a full set of controls are provided which to a great extent eliminate this danger. By soaring, and taking advantage of the upward currents of air, German pilots have established an altitude record of 2500 feet, an endurance record of 15½ hours, and a distance record of 42 miles from the point of take-off. The gliders, generally built in the form of a high-winged monoplane, are launched into the wind by means of a long rubber cord, which gives them an altitude of from 20 to 50 feet, depending upon the tension put in the cord. The Cassel soarer made in Germany has a wing spread of 65 feet, and weighs 214 pounds.

**Gliding in the United States.** Due both to the unsuitability of the terrain, and the relative cheapness of powered craft, gliding has never been received with great favor in the United States, although powered flight was accomplished through the gliding experiments of Chanute, Montgomery, and the Wright brothers. Gliding in America was abandoned for some time following the Wrights' success. Encouraged by the remarkable flights in Germany, the Curtiss Company in 1922 built the first flying-boat glider ever constructed. This gave a creditable performance over Long Island Sound. The same year, a monoplane glider was built by Nordman. Students at the Massachusetts Institute of Technology built a glider which was entered in a European contest, but crashed in one of the events, though until then it was leading in the scoring. Several hundred successful towed flights were made on a glider built by students at the California Institute of Technology. In 1928 an effort to encourage gliding was made, three German glider pilots being brought to the United States with several craft. Due to lack of suitable territory the exhibitions did not measure up to expectations. However, glider clubs have been organized, with a view to promoting annual meets.

**Helicopter.** As early as the time of Leonardo da Vinci, air travel by means of a revolving screw or propeller mounted on a vertical axis had been in the minds of scientific men. No attempt to realize this idea was successful until the twentieth century, when a number of devices were brought out which, if not successful on a practical basis, at least showed promise and indicated progress in this field.

In France a helicopter was devised by Pateras Pescara and constructed by the French technical section of aviation. Here, vertical motion was produced by the rotation of two wings in a horizontal position, and a small propeller was provided. In 1923, in the course of experiments at Issy-les-Moulineaux near the French capital, Pescara kept his machine in the air for three minutes, traveling above the ground at an average height of one meter, and at the conclusion remained stationary in the air for one minute. Other notable performances of the Pescara helicopter included a straight flight of 200 meters length, another of 460 meters, and a circular flight of 650 meters circumference, with the machine landing in a circle of 10 meters diameter from which it took off. Pescara's machine had an automobile-like body, on which was mounted a shaft turning a number of propellers.

It was at official tests held at Issy-les-Moulineaux during November, 1923, that Pescara managed to keep his machine in the air at a height

passenger-miles per fatality. The majority of the accidents were due to a lack of proper navigational facilities, both in the planes and on the surface, storms and fog obliterating the landmarks, and forcing the planes to land off their regular route. In 55 of the 85 accidents on transport lines, there were no injuries.

The U. S. Department of Commerce, in analyzing the causes of accidents, found that those attributed to faulty equipment were steadily decreasing, due to the greater care being exercised by manufacturers and operators in guarding against structural failures as well as to the increased facilities enabling the Department of Commerce to exercise control. About 29 per cent of the accidents were caused by poor technique on the part of the pilots, and indications seemed to point to the fact that a more thorough training of pilots was desirable. The contributing causes of the accidents occurring in 1928 are tabulated by the Department of Commerce as follows.

#### PRINCIPAL CONTRIBUTING CAUSES OF ACCIDENTS, 1928

Collision in air with other machines	8
Collision on or near the surface with other than aircraft	85
Forced landings due to failure of power plant	54
Forced landings without failure of power plant	242
Other landing accidents	194
Takeoff accidents	123
Taxying accidents	27
Fire in the air	9
Miscellaneous	83
Unknown	12
Total	1,062

In considering the above figures it must be borne in mind that very minor accidents such as broken wheels and struts are included. In 755 of the total number of accidents listed there was no personal injury, calling attention to the fact that about 75 per cent of the so-called accidents were of a trivial nature. It should also be noted that the fatalities were confined principally to student and miscellaneous flying, and that the regular transport service showed a very high degree of safety.

**Notable Flights.** The most notable flights which occurred during the first 25 years of practical flying are noted chronologically in the following table.

Dec. 17, 1908. At Kitty Hawk, N. C., the Wright Brothers made the first successful airplane flight, Orville Wright pilot.

Sept. 15, 1904. Orville Wright made the first successful complete turn with an airplane.

Sept. 21, 1908. Wilbur Wright, at Le Mans, France, flew 1 hr., 31 min., and 25 sec., establishing a world's record for duration and winning the Aéro Club of France 5000-franc prize.

July 25, 1909. Bleriot flew across the English Channel in 23 minutes.

Aug. 1909. Glenn H. Curtiss won the Grand Prix at Rheims in the first International Air Meet.

Oct. 26, 1909. Delagrèze at Doncaster, established a new speed record of 50 miles per hour.

Jan. 14, 1910. Paulhan at Los Angeles established an altitude record of 4165 feet.

Jan. 30, 1911. J. M. McCurdy attempted to fly from Key West to Havana and fell 10 miles short of his goal.

June 30, 1911. Harry N. Atwood flew from Boston to Washington.

Sept. 17 to Nov. 5, 1911. Calbraith B. Rodgers crossed the United States from coast to coast by an airplane in 49 days, making many repairs en route.

Aug. 20, 1912. Lincoln Beachy, at Chicago, set a new altitude record of 11,642 feet.

Oct. 16, 1912. Lieutenant Towers, U. S. Navy established a duration record of 6 hrs., 35 min., and 10 sec.

Feb. 7, 1913. Mutusis flew across the Dardanelles, 112 miles.

Aug. 17-18, 1913. Harry Hawker flew around the British Isles, 1043 miles in 2½ days.

May 29, 1914. The original Langley Aerodrome was flown as a seaplane at Hammondsport, N. Y.

June 20, 1915. Lieut. P. N. Bellinger raised the world's altitude record for seaplanes to 10,000 feet.

Nov. 20, 1916. Ruth Low flew a Curtiss biplane from Chicago to New York in 8 hrs., 55 min., and 35 sec.

March, 1917. Katherine Stinson flew from San Diego to San Francisco in 9 hrs. and 10 min.

May 15, 1918. First air mail flight between New York and Washington.

Sept. 18, 1918. Altitude record brought to 28,000 feet by Capt. R. W. Schroeder, U. S. A., at Wright Field.

May 18, 1919. First attempt to fly across the Atlantic failed when Harry Hawker and McKenzie Grieve were forced down beside a steamer after 14½ hours of flight.

May 31, 1919. First transatlantic flight completed by the U. S. Navy NC-4, via Trepassy Bay, Azores, and Lisbon, a distance of 4791 miles.

June 14, 1919. First non-stop flight across the Atlantic from St. Johns, N. F., to Clifton, Ireland. Flight made by Alcock and Brown.

Feb. 27, 1920. Altitude record set at 36,020 feet by Major R. W. Schroeder, U. S. A.

June 4, 1920. A duration record of 24 hrs., 19 min., 7 sec. established by Lieutenants Bosscontrol and Bernard at Etampes, France.

Nov. 25, 1920. The Pulitzer Trophy race won by Capt. C. C. Moseley at 178 miles per hour.

Sept. 28, 1921. Lieut. John A. Macready sets altitude record of 40,800 feet.

Dec. 30-31, 1921. Duration record set at 26 hrs., 12 min., 35 sec. by Eddie Stinson and Lloyd Bert rand in an all-metal plane.

Oct. 5-6, 1922. Duration record set at 35 hrs., 18 min., and 35 sec. by Lieutenants Kelley and Macready over Rockwell Field, San Francisco.

April 16-17, 1923. Kelley and Macready break their duration record by staying up 36 hrs. and 5 min.

May 2-3, 1923. Kelley and Macready make a non-stop, coast-to-coast flight from New York to San Diego, in 26 hrs. and 50 min.

Nov. 4, 1923. Lieut. A. J. Williams U. S. N., set world's speed record of 266.59 miles per hour.

May-August, 1924. The U. S. Army "Round the World" flight in which westbound crossings of both the Atlantic and Pacific were accomplished for the first time.

June 23, 1924. Lieut. Russell Maughan, U. S. A., flew from New York to San Francisco in 21 hrs. and 44 min., making 6 stops.

Aug. 31 to Sept. 1, 1925. Commander John Rodgers, U. S. N., made a distance record of 1730 miles in an attempt to fly from San Francisco to Honolulu.

May 9, 1926. Commander Richard E. Byrd, U. S. N., and Floyd Bennett flew across the North Pole.

May 20-21, 1927. The most spectacular flight of aeronautic history. Charles A. Lindbergh's flight from New York to Paris, 3600 miles.

June 4-5, 1927. Clarence Chamberlin with C. A. Levine for a passenger flew from New York to Eisleben, Germany, 3923 miles, non-stop.

June 28-29, 1927. Mantland and Hagenberger; San Francisco to Hawaii, 2407 miles.

June 29-30, 1927. Byrd, New York to Versur-Mer, France, 3477 miles non-stop flight.

Aug. 16-17, 1927. Dole Ruce, San Francisco to Honolulu; won by Arthur Gobel 2407 miles.

March 30, 1928. Major Mario de Bernardi, Italian Air Service, established a world's speed record of 318 miles per hour.

April 12-13, 1928. German flyers make the first non-stop westward flight across the Atlantic.

May 21 to June 8, 1928. First flight across the Pacific from Oakland, California, to Brisbane, Australia, by the *Southern Cross*, 7135 miles in 81 hrs. and 19 min. flying time.

July 3-4, 1928. Del Prete and Ferrarin, Italian flyers, established a distance record of 4466 miles in a non-stop flight from Europe to South America.

Aug. 20, 1928. Arthur Gobel and Harry Tucker flew from Los Angeles to Curtiss Field in 18 hrs., 58 min.

Jan. 1-7, 1929. The U. S. Army Fokker C-2 mono-plane, *Question Mark*, made a duration record, refueling in the air, of 150 hrs., 40 min., 14 sec.

Feb. 4-5, 1929. Capt. Frank M. Hawkes and Oscar E. Grubb beat Arthur Gobel's record from Los Angeles to Curtiss Field by cutting down the time to 18 hrs., 21 min., and 59 sec., using a Lockheed plane equipped with the N. A. C. A. cowling just developed at Langley Field.

May 8, 1929. Lieut. Apollo Soucek, U. S. N., made a new altitude record of 39,190 feet at Washington, D. C.

May 19-26, 1929. Airplane *Fort Worth* flying above Fort Worth, Tex., made an endurance record of 172 hrs., 32 min., refueling 17 times.

June 18-14, 1929. French Bernard monoplane *Yellow Bird* with 12-cylinder Hispano Suiza engine with aviators Jean Assolant, René Lefevre, and Armand Lotli, Jr., and a stowaway, flew from Old Orchard, Me., to Comillas, Spain, 3128 miles, in 29 hrs., 52 min. on a nonstop flight to Paris.

June 27-29, 1929. Capt. Frank M. Hawks made a round trip trans-continental flight from Roosevelt Field to Los Angeles and return in 44 hrs., 3 min., 2 sec.; actual flying time, 36 hrs., 48 min., 48 sec. He made an East-West record of 19 hrs., 10 min., and 32 sec. and West-East record of 17 hrs., 33 min., and 16 sec.

July 2-9, 1929. Refueling endurance record of 264 hrs., 44 min., made by L. W. Mendell and R. S. Reinhardt in Buhl sesqui plane with Whirlwind engine at Culver City, Calif.

July 8-10, 1929. Roger Q. Williams and Capt. Lewis A. Yancey in a nonstop flight to Rome from Old Orchard, Me., landed at Santander, Spain, with fuel tanks exhausted, and after refilling proceeded to Rome.

**Around-the-World Flights of 1924.** In 1924 a number of important attempts to fly around the world were organized, and representatives of the United States, Great Britain, and France started on carefully organized trips, meeting with varying degrees of success, but all contributing to the development and knowledge of the conditions of long distance flying. On Mar. 17, 1924, the United States Army Air Service started its flight around the world with an itinerary measuring between 25,000 and 26,000 miles. This flight started at Santa Monica, Calif., and extended north to Seattle and thence along the coast to Alaska, thence to Japan, from which it was continued to China, India, and the Mediterranean. Extensive preparations had been made for this trip, and the airplanes and engines employed were all American in design, material, and construction, built by the Douglas Company of Santa Monica.

The first part of the flight was made along the coast to Seattle with incidental stops en route, and on April 6, the four world cruisers officially started from Seattle flying to Prince Rupert, B. C. On April 10 they proceeded to Sitka, Alaska, and on April 13 they flew directly to Seward. Three of the ships flying from Seward reached Chignik, a distance of 450 miles, but Major Martin's plane failed to arrive, and the expedition was temporarily checked. Bad weather and other difficulties also delayed the flight in Alaska. On May 10 word was received that Major Martin and Sergeant Harvey had safely reached Port Moller, an isolated point on the Bering Sea shore of the Alaskan Peninsula, having wrecked their ship while flying in a fog on April 30.

The remaining three cruisers, under the command of Lieut. Lowell H. Smith, flew on May 9 from Nazan to Chicagoff on the Island at Attu, a distance of 530 miles, which marked the completion of the first of the seven divisions into which the grand journey of 27,000 miles was divided. On June 3 Lieutenant Smith, in command of the squadron successfully reached Japan, and on June 26 the American aviators were at Calcutta, where wheels were substituted for floats, motors changed, and new wings fitted. Leaving Calcutta on July 1, they flew across India and on to Constantinople. On July 13, they left Bucharest, and with a stop for luncheon at Budapest, reached Vienna at 3 p.m. Leaving Vienna the following day, they arrived at Paris in time to participate in the observance of the French national holiday commemorating the Fall of the Bastille. London was reached on July 16. The following day Brough was reached, and after repairs departure was made for Kirkwall. On

August 2, Lieutenant Nelson made Hornafjord, but Lieutenant Wade was forced down by motor trouble and his plane wrecked.

The flight was continued by Smith and Nelson by way of Iceland, where they picked up the Italian world aviator, Locatelli, who was given permission by the authorities in Washington to accompany Smith and Nelson. From Fredrikshavn to Ivigtut and from Ivigtut to Icy Tickle, Labrador, seemed a short safe distance in comparison with the dangers safely passed. The fliers arrived there August 31. The flight down the Atlantic coast, thence west to the Pacific coast, to return to the starting point at Seattle was literally a triumphal tour.

**Lindbergh's Flight.** Shortly after successful flights by Byrd and Amundsen to the North Pole in the spring of 1926 (see POLAR EXPLORATION), Raymond Orteig, a wealthy Paris hotel owner and a former resident of the United States, offered a prize of \$25,000 to the crew of the first airplane to make a non-stop flight from Paris to New York or from New York to Paris. The immediate effect of this offer was the awakening of an intense but friendly rivalry between the airmen of the two countries to see which could first accomplish the feat.

A French flyer, Capt. René Fonck, was the first to make the attempt, but his large, especially constructed airplane crashed on the takeoff from Roosevelt Field, Long Island, N. Y., and in the wreck and fire two of the crew were killed. Then in April, 1927, Lieut. Commander Noel Davis and Lieut. S. H. Wooster met their death in the *American Legion*, which they were flight-testing for the overseas trip.

At this time, Charles A. Lindbergh, twenty-five years old, was in the factory of the Ryan Airways, Inc. watching the construction of the cabin monoplane, *Spirit of St. Louis*, in which he was to make his memorable flight. Then followed news of the accident of Lieut. Commander Richard E. Byrd and his pilot Floyd Bennett, Lieut. George O. Noville and Anthony G. Fokker, in testing their Fokker monoplane *America*, built for the transatlantic flight. In this accident, Bennett was put out of the race definitely by a broken leg and Byrd received an injury to his wrist preventing his flying for three or four weeks.

On May 7, 1927, the famous French war ace, Capt. Charles Nungesser, and Maj. François Coli got away from Le Bourget Field near Paris for an East to West attempt. False news was spread in Paris the next day that the French flyers had successfully completed the trip and the whole nation went wild with joy. This joy was short lived, however, because the flyers failed to arrive and although a careful search of the land and water along the proposed route was carried out by the governments and airmen of both countries, no trace of them was ever found.

In the meantime, Clarence Chamberlin, who had attracted public attention by establishing a world's endurance record in a Bellanca-designed monoplane called the *Columbia*, had been financed by Charles A. Levine and Giuseppe M. Bellanca, officers of the Columbia Aircraft Corporation, for an attempt for the prize. Mr. Levine was to accompany Chamberlin as a passenger, but the start had been delayed to see how the French flyers made out and by trouble over the contractual relations of Levine and Chamberlin, Acosta, and Bertrand, with whom he had been negotiating for the trip.

This was the situation when Lindbergh arrived at Roosevelt Field on May 12, 1927, having flown from San Diego to St. Louis and from St. Louis to New York, the 950 miles of the latter hop being completed in 8 hours and 25 minutes, part of the way through a thunder storm.

The same day that Lindbergh reached the starting point, Commander Byrd's plane left Hasbrouck Heights, N. J., for the scene and then followed a week of preparation for the trip, anxious search for the missing French flyers and the scanning of weather reports by the crews of the *Columbia*, the *America*, and the *Spirit of St. Louis*, all cooperating in a spirit of friendly rivalry.

When Lindbergh announced that he was to attempt the flight alone, the American public was astonished but the astonishment soon turned to admiration and he became the prime favorite in the race. Just before midnight on May 20, Lindbergh made a sudden decision to be off. His mechanics were instructed to give the *Spirit of St. Louis* a final grooming while he hurried for a brief sleep. He was up again at 2 o'clock, the airplane was lashed to a truck and hauled to the runway down which René Fonck's Sikorsky plane had run to its fatal crash only a few months before.

After a long wait, the tanks were filled with 451 gallons of gasoline, 145 gallons more than the plane had ever lifted before and Lindbergh, with five sandwiches for food, a letter of introduction to Ambassador Herrick in Paris in his pocket, together with a return steamer ticket and a little expense money, was ready to start. Then followed a tense interval for the five hundred people who assembled in the rain to see the start. As the plane gathered headway down the runway, it seemed doubtful of taking off, but with only a few feet to spare, it just did manage to lift. Then followed a narrow escape from collision with a tractor lying directly in the path, and then a close margin clearing some telephone wires, but at last the *Spirit of St. Louis* was in the clear and on its way.

Bad weather was encountered on the way but the trip of approximately 3600 miles was accomplished successfully in about 33 hours.

There had been considerable doubt as to the reception Lindbergh would receive if he arrived in Paris. The situation had been made more tense by the circulation of an altogether false rumor that Nungesser and Coli had been led to their doom through false American weather reports. In their enthusiasm for the daring of the young American aviator, the French people, however, forgot any grievances and the reception accorded him was the largest and most enthusiastic ever offered a private citizen anywhere in the world.

Throughout the exciting days that followed, Lindbergh's bearing and conduct were such that he endeared himself to the entire world and accomplished more toward restoring friendly feeling toward America than could have been accomplished in years of diplomatic effort through the usual channels. Thus, a flight which started as a competition for a prize ended as an event of very great international importance.

Another important effect of this flight and of those of Byrd and Chamberlin which followed, was the awakening of the American people to a genuine interest in aeronautics. This flight and the work which Lindbergh continued brought

aeronautics to the fore as one of America's greatest commercial interests with the result that commercial activity in the year following was more than doubled.

#### OFFICIAL WORLD RECORDS RECOGNIZED BY THE F. A. I.

(May 15, 1920)

Airplanes returning to the point of departure without refueling.

*Duration*, Johann, Risztios, and Wilhem Zimmerman (Germany), Junkers W-33 Junkers LV, 280 h.p., at Dessau, July 5, 6, 7, 1928, 65 hrs. 25 mins.

*Distance* (Closed circuit). Arturo Ferrarin and Carlo del Prete (Italy), Savoia-Marchetti S-64, Fiat A-22. Course Casale dei Prati, Torre Flaria, Fara, d'Anzio, May 31, June 1-2, 1928. 7666.6 kms. (4763.7 miles).

*Distance* (Airlie). Arturo Ferrarin and Carlo del Prete (Italy), Savoia-Marchetti S-64, Fiat, 550 h.p. Rome to Tourois, Brazil, July 3-4-5 1928, 7188 kms. (4466 miles).

*Altitude*. Lieut. Apollo Soucek, U. S. N. (United States) Wright Apache, Pratt & Whitney Wasp, supercharged, 425 h.p. Anacostia, D. C., May 8, 1929, 39,190 ft.

*Maximum Speed*. Warrant Officer Bonnett (France), Ferbois Monoplane, Hispano Suiza, 550 h.p., at Istres, France, Dec. 11, 1924, 448,171 kilometers (278.480 miles) per hour.

#### SPEED FOR SPECIFIED DISTANCE WITHOUT PAYLOAD

*Speed for 100 kilometers*. Lieut. Cyrus Bettis, U. S. A. S. (United States), Curtiss R3C-1, Curtiss V-1400, 600 h.p. Mitchel field, Oct. 12, 1925, 401.279 kilometers (249,342 miles) per hour.

*Speed for 500 Kilometers*. Sadi LeCointe (France), Nieuport to Delage, Hispano Suiza 500 h.p., at Istres, June 23, 1924, 306.696 kilometers (190.567 miles) per hour.

*Speed for 1000 kilometers*. Fernand Lasne (France), Nieuport to Delage, 42C-1 Hispano Suiza, 500 h.p., Etampes, Aug. 29, 1925, 248-292 kilometers (154.293 miles) per hour.

*Speed for 2000 kilometers*. Fernand Lasne (France), Nieuport to Delage, 42C-1, Hispano Suiza, 500 h.p., Etampes, Sept. 12, 1925, 218.750 kilometers (135.930 miles) per hour.

*Speed for 5000 kilometers*. Arturo Ferrarin (Italy), and Carlo del Prete, Savoia-Marchetti, S-64, Fiat A-22. Course, Casale dei Prati, Torre, Flaria, Fara, d'Anzio, May 31, June 12, 1928, 139.177 kilometers (86.479 miles) per hour.

*Air Mail*. One of the earliest suggested applications of the airplane was to the transportation of mail and small packages where time was an important consideration. This was attempted spasmodically before the World War, and during that conflict, airplanes were employed to transmit dispatches and various articles or small freight. In the United States during the War, there was inaugurated, on May 15, 1918, a regular air-mail service between Washington and New York, which functioned for a year with a performance of 92.73 per cent, carrying 7,720,840 letters with revenues from the sale of airplane mail stamps amounting to \$159,700, as against a cost of service of \$137,900.06. This air mail was started by the United States Army aviators, but on Aug. 10, 1918, it was turned over to the Post

# AERONAUTICS

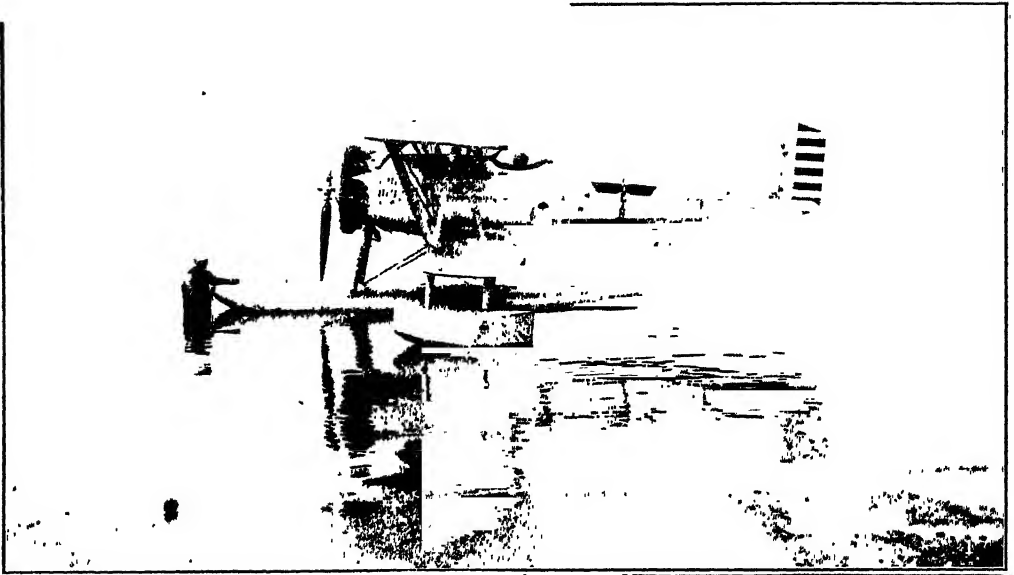


*Official Photographer, U. S. Army Air Corps*  
UNITED STATES ARMY AIR CORPS AVIATORS DRESSED FOR  
HIGH-ALTITUDE PHOTOGRAPHIC FLIGHT, SHOWING  
CAMERA AND OXYGEN TANKS USED.



NICHOLS FORM-FITTING BACK-PACK PARACHUTE DEVELOPED  
BY SERGEANT ERWIN H. NICHOLS, U.S.A.

## NAVAL AVIATION



*Official Photographs, Bureau of Aeronautics, United States Navy*

1. BOEING FIGHTER OF UNITED STATES NAVY.
2. SIKORSKY AMPHIBIAN.
3. FOKKER THREE-MOTOR MONOPLANE, AS USED BY UNITED STATES MARINES IN NICARAGUA.



Office Department, by which all such activities were subsequently conducted. On May 15, 1919, the Cleveland-Chicago air route was established, and on July 1 of the same year New York and Cleveland were connected, the combined service making possible a substantial reduction of the time of transmission for letters between these centres, enabling them to catch mail trains, or advancing them over mail-train time. On July 18, 1919, the rate on airplane mail was reduced to \$.02 an ounce, the regular first-class rate; from that time, the air mail was on the same basis as other means of transportation. In Europe also, a beginning was made in aerial mail service, and during the British railway strike of 1919, mail was carried by airplane. The first regular French aerial postal service was inaugurated, Nov. 10, 1919, when mail was transported to England from Bourget, near Paris, and service was maintained between that place and Hounslow near London. On longer and shorter routes, air-mail lines were established.

On Sept. 8, 1920, the first transcontinental mail left Mineola Field near New York City, reaching Marina Field near San Francisco on September 11. This was made possible by the establishment of definite routes or stages with dépôts at the change points, and while through mail was not carried as a regular thing, the ordinary mail was advanced wherever possible.

In 1923 United States mails were carried under contract between Seattle and Victoria, B. C., on Puget Sound; from New Orleans, La., along the coast by the Gulf Coast Air Line; and in Alaska, between Fairbanks and McGrath, where the airplane was given a thorough and successful test in competition with dog sleds for the transportation of local mails.

The transcontinental mail service at first was not a through service but aimed to advance the railway mail over the various stages and thus cut down the actual time of transportation materially. So regular and reliable was this service, that in the week ending Aug. 25, 1923, tests were made showing the practicability of a direct 28-hour service between the Atlantic and Pacific coasts by relays of mail planes flying both day and night over a distance of 2680 miles. These night flights, which made continuous movement of the mails possible, were made on the specially equipped and lighted airway between Chicago and Cheyenne, and it was shown conclusively that direct service between New York and San Francisco could be maintained as soon as authorized by Congress, which action came in the following year.

Under authority provided by Congress in the spring of 1924, the Postoffice Department was empowered to establish a transcontinental mail which would permit direct transportation from the Atlantic to the Pacific coast. For this service, there was established a graded charge ranging from \$.08 to \$.24, the country being divided into zones, as from New York to Chicago, Chicago to Cheyenne, and Cheyenne to San Francisco. The airplanes used in the test flights of 1923 to determine the feasibility of a regular through mail service from coast to coast used night flying for this service along with special planes of new types. The illuminated airways were available for regular mail work, which was begun on July 1, 1924. On May 1, 1929, night transcontinental air service between New York and San Francisco was established on a 31 hour schedule from field to field.

By the end of 1927, air-mail routes had been extended to reach almost every part of the United States. Additional routes were Boston to New York, Chicago to St. Louis, Chicago to Dallas, Salt Lake City to Los Angeles, Pasco to Elko, Detroit to Cleveland, Detroit to Chicago, Seattle to Los Angeles, Chicago to Twin Cities, Atlanta to Miami, Cleveland to Pittsburgh, Cheyenne to Pueblo, Seattle to Victoria, New Orleans to Pilot-town, Cleveland to Louisville, Detroit to Grand Rapids, and New York to Atlanta.

By this time also, all of the mail routes were operated by private concerns, this having been made possible by the Kelly Act passed by Congress in 1926, which authorized the Postmaster General to contract with private parties for this service. The government through the Department of Commerce continued marking and lighting airways, and the system as now developed is very extensive.

Statistics show that the United States leads all other countries of the world in miles flown in transport operations. This showing is made possible only through the extensive development of the air-mail service, as both Germany and France surpass the United States in the number of passengers carried. This difference in development is due primarily to the fact that the European countries have granted subsidies to the operators, which have enabled them to carry passengers at rates sufficiently low to attract the traffic. The well-established American policy of requiring every industry to develop with no direct government help has made it necessary for the operators in the United States to seek loads which would pay a higher rate per pound. Mail and express meet the situation, with the result that the carrying of passengers is a secondary consideration and the United States lags far behind Europe in this activity.

At the end of 1928, there were 15,128 miles of airways in the United States, two-thirds of that mileage lighted and otherwise equipped for night flying. There were 32 air-line companies operating on regular daily schedules, the mail planes alone flying a total average of 27,848 miles every 24 hours. In 1926 there had been only 19 operators, in 1927 the number had grown to 24, and the operating companies had grown considerably in size and were in a much better financial position. In 1928 the air lines had 294 transport planes in service which flew a total of 10,472,024 miles as compared to 5,242,839 miles in 1927. The doubled mileage was accompanied by a 300 per cent increase in mail poundage, and a 400 per cent increase in the number of passengers carried on regularly scheduled service. In 1928 the transport planes carried 3,672,059 pounds of mail, and 52,934 passengers. Express business also had a healthy growth, and proposed cooperation with transcontinental railways to offer combined rail and air service gave promise of a still further increase in passenger traffic. Schedules for 48-hour service between New York and Los Angeles were announced in the summer of 1929.

Legislation in the United States. Prior to the enactment of the Air Commerce Act in May, 1926, there had been in the United States no national laws and very few State laws governing aeronautical activities. This lack of government control and direction probably retarded progress considerably, because the public could not reasonably be expected to consider the war surplus airplanes and motors, with which they were invited to fly, as being reason-

ably safe, especially in view of the fact that no standard of air-worthiness was established by which they could judge the safety of the airplane, and no examination of the pilot or license for him was required, by which his ability to handle the machine could be judged.

The Air Commerce Act very effectively remedied this situation. The National Advisory Committee for Aeronautics summarizes the act as follows:

This act provides the legislative cornerstone for the development of commercial aviation in America. It establishes certain fundamental principles, to govern the relation of the Federal Government to the whole problem of aiding the development of commercial aviation in America on a sound basis. The act asserts the doctrine of Federal Sovereignty in the air over the lands and waters of the United States, to the exclusion of foreign nations. It asserts under the commerce laws of the Constitution the right of the Federal Government to regulate interstate air commerce. It authorizes the designation of airways by the Federal Government, and compels adherence to a single set of Federal flying rules on the part of all who use such airways, regardless of whether they are engaged in interstate or intrastate air commerce, or private flying. It authorizes Federal lighting systems along airways, and the Federal establishment and maintenance of emergency landing fields. It authorizes the transfer of the postal airways, including emergency landing fields, to the jurisdiction of the department of Commerce, and the transfer of the Postal Air force or terminal facilities to the jurisdiction of the municipalities concerned, under arrangements subject to the approval of the President. It contemplates the establishment and maintenance of airports by the municipalities concerned, under arrangements subject to the compulsory registration of aircraft engaged in interstate commerce, and for the optional registration of other aircraft. It provides for the periodic examination and rating of airmen serving in connection with registered aircraft. It provides for the emergency use of existing governmental facilities, extends the application of existing laws to foreign air traffic, and in short, imposes upon the administrative officer concerned—the Secretary of Commerce—the duty of fostering the development of air commerce in the United States.

The act also authorized the appointment of an Assistant Secretary of Commerce for Aeronautics, and thus the Aeronautics branch of the Department of Commerce came into being.

In carrying out the intentions of the act, the establishment of aids to navigation was delegated to the Lighthouse Service, and the mapping of airways to the Coast and Geodetic Survey. To consolidate research work, a special aeronautics division was established in the Bureau of Standards, and a new organization built up to check the structural safety of flying equipment and to determine the ability of pilots applying for licenses under the act.

Other important legislation affecting aeronautics enacted by the 69th Congress were the five-year aircraft procurement acts for the Army and Navy. With a programme outlined in advance, manufacturers were less reluctant to proceed with expansion plans, and the stabilization of the industry was materially aided.

**Aerial Photography.** During the War, the observers in airplanes flying over the enemy lines early proceeded to take photographs which gave an adequate representation of the terrain below. These photographs were very valuable both to the high commands and to the fire control officers of the various batteries, and it did not take long to develop the work on a systematic basis as a means of adding to the information contained on the military maps. After the close of hostilities, it was realized that photography from airplanes had valuable scientific and commercial applications, and accordingly a number of the government bureaus pro-

ceeded to employ airplanes and photographers in coast and topographical surveys and mapping for rapid reconnaissance examinations of new country. It was found also that photographs made from airplanes afforded an extraordinary picture of a wide range of territory, and in addition to maps and topographic studies such photographs of water fronts, terminals, factory sites, and other similar objects for industrial uses in connection with engineering and construction purposes were in increasing demand. Substantial improvements were made in the apparatus, and a new film magazine was designed which permitted aerial enlargements on a more efficient basis. There also was developed in 1922 what was known as a hypersensitized panchromatic film several times faster than the film first used, and this contributed to the success and character of the pictures.

**Other Applications.** In the United States, the various government agents were quite willing to make extensive experiments with the airplanes for various purposes when the machines could be placed at their disposal. The Department of Agriculture in its war against various insect pests, has distributed powdered calcium arsenate over cotton plants from an airplane flying at heights of 25 to 50 feet. This dusting of the cotton plants with calcium arsenate has worked effectively to destroy the boll weevil and has been found very practical. The gypsy moth was attacked in somewhat similar experiments carried on with a motor balloon, while in the Philippines, a plague of locusts was handled in the same manner. The patrol of the forests by airplanes during the dry season, as in some of the Pacific States, proved a very efficient way to detect incipient fires; a report by radio telephone would immediately bring the matter to the attention of the nearest forest ranger or fire-fighting force.

**International Aeronautic Federation.** On Oct. 14, 1905, the International Aeronautic Federation (*Fédération Aéronautique Internationale*, F.A.I.) was formed, for the purpose of recording aeronautic performances throughout the world and soon became the sole international authority in aeronautic sport. The authority of this body in aeronautic sport and technical matters is recognized and duly enforced by the national aero clubs or aeronautic associations of the leading countries. The headquarters of the F.A.I. are in Paris, France. Its representative in the United States is the National Aeronautic Association.

**National Aeronautic Association.** On Oct. 12, 1922, the National Aeronautic Association was formed at Detroit, principally to "foster, encourage, and advance the science of aeronautics and all kindred and allied sciences." This national body maintains its headquarters at Washington, D. C., and is the national representative of the International Aeronautic Federation transmitting to the headquarters of that body for approval records and other matters requiring international sanction.

**Aeronautic Chamber of Commerce.** In 1921 there was also established, with headquarters in New York City, the Aeronautic Chamber of Commerce of America, made up of persons, firms, and corporations engaged in the business of manufacturing, buying, selling, and dealing in aircraft motors and aircraft parts and accessories of every kind, and to advance in general aeronautical industry and commerce. In addi-



tion to various activities of a purely commercial nature, this organization in 1919 began the publication of *Aircraft Year Books*, authoritative annuals which soon established themselves as invaluable to the student of aeronautical progress.

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See INTERNAL COMBUSTION ENGINES; PHYSICS; BOMBING OF VESSELS BY AIRCRAFT; STRATEGY AND TACTICS; WORLD WAR.

**ÆSTHETICS.** In this as in most other sciences of man, the empirical and the metaphysical are so intermingled that scarcely a writer can be found who does not at one point or another confound the two. The modern tendency is to reject metaphysical interpretations and to concentrate upon the positive scientific aspects of problems. Since the beginning of the World War, the philosophic school of æsthetics has been represented by Bosanquet and Croce. Both of these men, with somewhat varying viewpoints, made the idea of the beautiful into a *drapeau* or standard around which to orient much, if not all, of the activity of life. Bosanquet stressed

chiefly the Greek notion of contemplation, in which the finite being finds a brief but ineffable union with the eternal and the absolute. Croce's conception reflected more the dynamic and active aspect of æsthetic experience; he made all art and even the enjoyment of art consist in the expression of an intuition. This intuition, it may be explained, is really nothing more than the act of judgment or perception in so far as it affirms, perceives, or creates a unity. The æsthetic experience, according to both Bosanquet and Croce, is created by the perceiving subject; created entirely, according to Croce; created by the mind in an act of union with a reality which he does not completely control, in the more Platonic conception of the British philosopher.

The philosophic view of æsthetics deliberately ignores the more empirical problems as to what makes a specific object beautiful. This line of attack has been taken up by the psychologists and sociologists of æsthetics. In psychology, the effort was made for a long time to run down the æsthetic experience by experimentally confronting the state of mind with the laboratory stimuli of different æsthetic qualities. Out of this approach has come the notion of empathy, what the Germans call *Einfühlung*, or sympathetic attribution of qualities to an object. H. G. Hartman (*Æsthetics: A Critical Theory of Art*, 1919) and R. Haman ("Zur Begründung der Ästhetik," *Ztsch. für Ästhetik*, 1915), both attempt to determine the fundamental basis of the æsthetic experience. Researches into the psychology of æsthetics have been continued along more literary, less rigidly experimental lines. Among those who worked in this field may be named Langfield, Marshall, and C. K. Ogden. For a discussion of the psychological approach to æsthetics, see C. E. Whitmore, *American Journal of Psychology*, 1927.

The sociological approach to æsthetics was prevalent in the writings of the French æstheticians. What they attempted to do was to treat æsthetic phenomena in much the same way that modern scholarship treats moral and religious customs, as a function of the changing society. This approach has yielded more results in connection with literature and architecture than with the fine arts. We come here to the question of *motifs*, which are the carriers, as it were, of the æsthetic emotion. There can be no doubt that these *motifs* are responsive to social changes. A corollary more or less improperly deduced from this fact is that art and literature should be used as vehicles for social and moral propaganda. This view was largely championed by political radicals and others interested in morally reforming or revolutionizing society. In Soviet Russia, it may be noted, the revolutionary conception of art and culture was carried to an extreme. The attempt was made to create a special culture representative of the proletariat—the so-called *proletkult*. The absurdity of the programme became apparent even to such men as Trotsky, who in 1923 threw all his influence against the movement. In times of social stress, it is also to be expected that art would be used as an agent for the conservation of values. This tendency was manifested in practically all countries. In America, the group headed by Irving Babbitt, Paul Elmer More, and Stuart P. Sherman expounded a certain variety of classical humanism, which was to serve as a bulwark against the subversive influences of social romanticism. In France, the jealous courting of the muses by

rival social factions was to be seen in the clash of the *Action Française* group with the writers of advanced opinions affiliated with the *Clarté* movement. From a reaction against the attempts to drag æsthetics into the politics of the right and the politics of the left developed a recrudescence of the ivory tower conception of art. The *Creed of an Æsthete* was loudly proclaimed in England and America by such men as Clive Bell and Leo Stein. Such manifestoes were met by the iconoclastic fire of Bernard Shaw, who knew better than most radicals how to synthesize art and social idealism without disobeying the dictates of good sense. An interesting sidelight on the philosophic aspects of this problem is provided in a prize memoir submitted by Charles Lalo to the French Academy of Moral and Political Science. To the question whether art can emancipate itself from morality, M. Lalo replied that they ought to live together in Platonic friendship. The union is difficult, but it is also necessary and unavoidable.

No exposition of modern æsthetics can be regarded as complete without a discussion of psychoanalysis. The doctrines of psychoanalysis contain gleanings from a number of philosophies. In their emphasis on the will to live and the expression of the unconscious, they are linked up with Nietzsche, von Hartmann, Schopenhauer, and their various intellectual ancestors. But besides these conscious philosophical elements, there is in psychoanalysis a subconscious tendency, to use a Freudian term, to view all things from the point of view of the psychiatrist. The therapeutic value of art was recognized as early as the days of Aristotle; in a vaguer manner, the relation of art to the pathological expressions of the sex instinct was also perceived. The distinct and daring originality of psychoanalysis lies in the fusion of these scattered intuitions into a more or less coherent system. Art, according to Pfister's version of psychoanalytic doctrine, is the expression or sublimation of inhibited tendencies. By the act of objectification, the artist gets relief from his emotional sufferings. This theory at once accounts for the prevalent preoccupation of art, particularly the literary arts, with sexual themes; for there is no doubt that in civilized society, it is the sex instinct rather than the food and shelter instinct which because of its imperiousness must needs be restrained.

From the point of view of the psychiatrist, who must take the biological categories for granted, it is inevitable that art should be regarded as a biological safety-valve. But this is obviously not the whole story. The instincts and tendencies which the psychiatrist accepts as given, the philosopher would call into question. Freud himself, when in his philosophic moments he transforms all tendencies into derivatives of the great *Libido*, becomes a metaphysician and, as such, must take all the risks of metaphysics. The *Libido* cannot have a concrete sexual signification; it becomes the *Eros* of Plato, the *will to live* of Schopenhauer, the *intellectual love of God* of Spinoza. But these conceptions are beyond the realm of empirical science, although they make the shortcomings of that science comprehensible.

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**AFFLECK, SIR JAMES ORMISTON** (1840-1922). A distinguished consulting physician and extramural teacher of clinical medicine of Edinburgh. He was educated at Edinburgh University and associated during most of his medical career with the Edinburgh Royal Infirmary and the Longmore Home for Incurables, of which he was co-founder. He was an authority on eruptive fevers and a Fellow of the Royal College of Physicians of Edinburgh (1875). He was knighted in 1911.

**AFGHANISTAN**, af-gān'-i-stan. An independent monarchy of Central Asia bounded by British India on the south and east, Persia on the west, and Russian territory on the north. The southern boundaries, long undetermined, were fixed by a convention with Great Britain in 1921. The total area is estimated at 245,000 square miles; the population at approximately 8,000,000. The dominant racial element is the Afghan, which embraces Islam, and the leading languages are Persian and Pushtu. The capital, Kabul, has an estimated population of 100,000. The other large cities are Kandahar (60,000) and Herat (121,000). The activities of the Afghans continue to be centred in the plains and valleys, and agricultural and grazing products are the chief support of the country. Copper and lead are reputed to be found in the northern districts, though no extensive mining is carried on. Gold mines were worked under the British at Kandahar. The trade is chiefly carried on with India and Bokhara. The exports into India include timber, fruits and vegetables, grain, silk, cattle, hides, tobacco, asafoetida, and particularly wool. The articles imported from India include cotton goods, indigo and other dyes, sugar, hardware, and silver treasure. In 1917-18 the Indian statistics reported for this trade exports into India of £1,147,000; imports from India, £1,258,000; for 1924-25, exports into India, £203,100; imports from India, £122,000. No large improvements have been made in the modes of transportation and Afghans still resort to camel and horseback. Intercourse is somewhat furthered by the establishment of telephone communication between Kabul and Kandahar, Jaka and Jalalabad. Under the Amir Habibulla, motor roads were constructed for short stretches, principally from Kabul to Kandahar, and from Kabul to Dacca.

During and since the World War, Afghanistan played a part in Central Asiatic affairs that

seemed hardly warranted by its isolation geographically and its backward state economically. Its position between Russia and India and the fact that it remained one of the few countries still preserving the spirit of militant Islam enhanced this importance. Afghanistan was courted assiduously by Russia, Great Britain, and Turkey in turn. The friendly relations that the British government of India had maintained with Afghanistan since 1907 served the Allies in good stead during the War. With the outbreak of hostilities in 1914, the British succeeded in securing a pledge from the Amir Habibulla Khan, that his country would observe a strict neutrality. The Amir's position became increasingly difficult with Turkey's entrance on the side of Germany for attempts were made by German and Turkish officers and Indian Nationalists to preach a Holy War. The Amir successfully kept the Afghans aloof from the struggle and, as a result of his activities in checking the unruly frontier tribes, he earned the lasting gratitude of the British Indian government. Unfortunately for Great Britain's peace, Habibulla was assassinated on Feb. 20, 1919. His successor, Amanullah Khan (the third son of the late Amir), at once proclaimed the external independence of the country and attempted to establish relations with the Soviet Government at Moscow. An Afghan Army was dispatched to the Indian frontier in May, 1919, and but for the prompt action of the British might have caused serious disaffection among Indian Moslems. Fighting with irregular Afghan troops continued until the signing of peace in August, 1919. As a result of the Anglo-Afghan treaty, Afghans were denied the privilege of importing arms through India; the Amir's demand for the payment of the arrears of the national subsidy was refused; and the subsidy was entirely discontinued. On the other hand, the treaty freed Afghanistan from its dependence upon the British government for its external policy and left the country free in both its domestic and international relations. The awakening interest of Soviet Russia in Eastern affairs served further to complicate matters.

A treaty signed at Moscow on Feb. 28, 1921, provided for the establishment of five Russian consulates in Afghanistan, for a yearly subsidy to the Amir, and for recognition of the independence of Bokhara and Khiva, the Russians also proposing to construct a telegraph along the line Kusha-Herat-Kandahar-Kabul. This new Afghan temper was further encouraged during this period by the activities of the Turkish Nationalists, who signed with Afghanistan at Moscow (Mar. 1, 1921) a treaty of accord, and by religious, political, and racial movements in the Near East and India which tended to draw Afghanistan away from British influence and boded no good for British security in India. A British mission was accordingly sent to Afghanistan. It negotiated a new treaty (Nov. 22, 1921) by which Afghanistan was again permitted to import arms through India and again guaranteed her independence, but which did not materially offset Russia's gains. A further trade convention, June, 1923, granted favored transportation and customs rights.

Following the establishment of full independence, Afghanistan entered on a period marked by an intensified national consciousness and a vigorous and comprehensive programme of westernization designed to raise the country from its age-long primitive tribal status to that of a

modern nation. In pursuing this programme, Amanullah took the lead. In 1921 he promulgated a new Constitution which provided for a limited monarchy in place of the autocracy, although he retained for himself the post of prime minister and most of the legislative and executive authority. Compulsory education, as far as it could be practically applied, was decreed and, in January, 1921, the status of slavery, under which the semi-Mongol Hazarah tribes of the Central-North slopes of the Hindu-Kush had suffered for generations, was abolished. Diplomatic relations were begun with several countries of Europe and Asia, the army was reorganized, the building of a new capital was begun (1924), to be called Dar-ul-Aman, and foreign engineers were engaged to connect it by rail with Kabul. But the pace of reform proved to be too fast for all the country to follow.

In 1924 a formidable rebellion broke out in the Mangal tribe of the Khost district. It was charged by the Russians that British influence encouraged the revolt, but the immediate occasion was without doubt the resistance, by religious and military elements, to the modernizing innovations. The revolting forces rallied around Abdul Karim and proclaimed him Amir. After many months of fighting, the insurrection was overcome and the rebels were severely punished. Through 1925, however, there was latent restlessness and the Amir refrained for a while from pressing his reforms as vigorously as before. Yet, in various directions, he continued to promote the rejuvenation of the country. He opened new primary and high schools and promoted instruction in mining, telegraphy, law, etc. The effectiveness of foreign airplanes in helping to put down the 1924 rebellion deeply impressed the Amir and from that time on he gave special attention to the development of an air service through the purchase of planes and the sending of young men abroad for training in flying. The national budget was reorganized and high customs duties were laid upon imports. In June, 1926, the Amir took the title of King. In the same year, the metric system of weights and measures was adopted. The tendency to draw closer to Russia, which had marked Amanullah's reign from the beginning, produced a treaty with the Soviet government, Aug. 31, 1926, which provided for neutrality on the part of each when the other was at war, and for non-aggression.

In December, 1927, Amanullah and his Queen began a tour of European countries which took them through Italy, France, Belgium, Germany, England, Poland, Russia, and Turkey and lasted six months. On his way to Europe, Amanullah delivered in Bombay a notable address to Moslems urging tolerance of other religions. The royal travelers were everywhere showered with attentions, but the chief tangible diplomatic result was the signing of a treaty of alliance with Turkey, on May 27, 1928, which provided, among other things, for the sending of Turkish experts to Afghanistan to help in modernizing the army. Amanullah was more deeply impressed than ever with the achievements of the Western nations, and he ended his tour, moreover, in a Moslem country like his own which was being made over along Western lines. Fired with new zeal for his reforms, he took up his modernizing programme again with great vigor. His proposed innovations were sweeping. While he did not attempt to impose them all on the whole country forthwith, the reforms he favored and partially en-

forced included adoption of European clothing, shaving of beards, discarding of the veils by women, democratizing the Parliament, adoption of universal manhood suffrage, abolition of ceremonial dress, thorough modernization of the army, abolition of titles of nobility, abolition of polygamy, building of railroad bridges and highways, technical training of students, reorganization of government finances, etc.

In his endeavors, the Amir enjoyed widespread support by the more intelligent elements of the population. But some of the reform struck directly at age-old religious customs and once more certain fanatical mullahs called the tribes to resistance. Revolt flamed up swiftly, chiefly among the Shinwaris, who occupied territory lying partly under British rule in India, southwest of Khyber Pass. They cut the road between Kabul and India and threatened the capital. But Amanullah's forces met and defeated them and he apparently had the situation in hand when a brigand chieftain, Bacha Sakan, or "The Son of the Water Carrier," who had at first sided with the King, turned on him and advanced on Kabul. The King thereupon treated with the rebellious tribes and made large concessions to them with respect to the reform programme. But it was too late to save the capital. When its capture was imminent, numbers of foreign women and children were carried to India in large British airplanes. On Jan. 14, 1929, the King, unable longer to maintain his position, abdicated in favor of his brother Inayatullah Khan and fled to Kandahar. But Inayatullah reigned only three days, when he, too, fled from Kabul and left the government to Bacha Sakan. The latter declared himself King under the title Habibullah Khan and organized a government. His support in the country, however, was doubtful, and Amanullah, at Kandahar, rescinded his abdication and prepared an army to attempt to regain the capital.

**AFRICA.** A continent of the eastern hemisphere with an estimated area of 11,500,000 square miles, exclusive of islands. Detailed accounts of African developments in recent years, political, geographic, and economic, will be found under the heads of the separate political divisions. See *ABYSSINIA, ALGERIA, EGYPT, MOROCCO, TUNIS, SOUTH AFRICA*, etc.

**Explorations.** In the Sahara, an expedition under Colonel Tilho (1912-17) described the hydrography and orography of the eastern Sahara, demonstrated the absence of any connection between Lake Chad and the Nile Basin, explored the Tibesti and Endi Mountains, penetrated a region of 1200 miles previously unvisited, discovered a mountain formation in the Libyan Desert and surveyed more than 6000 miles. In 1919 Captain Augiéras announced his researches in the western Sahara, describing the extent of the central plateau. In 1920 he crossed the southwestern Sahara in Morocco and corrected previous surveys of the region. In 1921 Commandant Lauzanne crossed the western Sahara and opened up a new route between Algeria and the West. In 1923 Hassanein Bey explored parts of the Libyan Desert from Sollum to Siva and to the capital of Darfur. The years 1922-24 saw the following expeditions in the field: The investigation of irrigation problems of the Niger Valley under Proust, Valude, and Audoin; the collection of fauna and flora of the mountains of the Sahara under Babault; an expedition to study Tunisian ornithology under Balzac; a

study of the fauna and flora of Central Africa under Bruneau de Laborie. Since the World War, several expeditions have experimented with the automobile as a means of transportation and have crossed the Sahara at different places. In Tunis, Dr. Borchardt sought for traces of the lost continent of Atlantis. Studies of ancient man have been carried on in Algeria by the Beloit-Logan Museum Expeditions of 1927 and 1928. Count de Prorok led an archaeological expedition to the Hoggar in 1925. In 1928 a group of scientists from the University of Algiers under M. Reygasse studied the natural history of the Hoggar. The Augiéras-Draper Expedition of 1927-28 explored and mapped the district between the Hoggar and the Niger and contributed much information on the archaeology and natural history of the area. French military missions have acquired much information in the course of their penetration into the little-known regions of the Sahara.

Archæological work in Egypt was continued by the Egyptian Department of Antiquities. The Metropolitan Museum of Art, New York City, made some important discoveries in 1928 and British researchers continued their work at the royal tombs and in the Fayum. In the Nile Basin, English parties explored the Sobat River system, the country between Bahr-el-Jebel and Lake Rudolf and the divide between the Congo and Nile rivers. In 1920 a British aviator, flying over the Nile Basin, discovered a hitherto unknown range of volcanic hills lying north of Khartoum.

The Abyssinian Highlands have been visited by a number of French, Italian, and German ethnologists. Collecting expeditions have been sent out by the Field Museum of Natural History. An English expedition studied the hydrography of Lake Tsana. In 1928 the Duke of Abruzzi led an expedition to the source of the Webi Shebelli.

In East Africa, a British expedition (1919-20) under Roscoe carried on extensive ethnographical investigations in Uganda. A Smithsonian Institution party was maintained in Central and South Africa covering the Transvaal, Kafue River Valley, Lake Tanganyika and the Budongo Forest for the collection of fauna and flora. Shantz gathered 1600 specimens of plants for introduction into the United States. Prince William of Sweden in explorations in the regions south of Uganda collected 1000 mammals, 2000 birds, and more than 6000 insects. The ætiology of the tribes in the Mongalla district was investigated by an Anglo-Egyptian group. The establishment of mandates after the World War led to considerable activity in the matter of boundary surveys and in many cases careful studies were made of the physical characteristics and economic resources of the mandates.

The Smithsonian-Chrysler Expedition of 1926, which collected for the U. S. National Zoological Park, was one of the many big game expeditions to East Africa. Martin Johnson devoted much time to filming the fast-disappearing wild life of this region. Expeditions from the American Museum of Natural History have included the work of Carl Akeley in the preparation of animal groups, the 1927 Taylor expedition to the Sudan for the collection of birds and mammals, the Ruwenzori-Kivu Expedition of 1926-27, the Rockefeller ornithological expedition, and the Carlisle-Clark expedition of 1928. The British Museum sponsored the archæological investi-

gations of Leakey in Kenya and the Cutler Dinosaur expeditions which went into Tanganyika.

West Africa and the Congo Basin have been frequently visited by tropical disease expeditions. Some of the American ones have been sponsored by Harvard University, the Rockefeller Institute, and the Smithsonian Institution. Botanical specimens were gathered for the U. S. Department of Agriculture by the Armour expedition to West Africa. In 1927 Professor Olufsen led an expedition to Senegal and Nigeria under the Carlsbad Fund.

The Zimbabwe ruins have attracted much attention and Dr. Frobenius made an archæological study of this group in 1928-29. The Cameron-Cadle expeditions of 1926 and 1928 sought for remains of ancient man in the Kalahari Desert. Linton led an ethnological expedition to Madagascar in 1926-27 to collect material for the Field Museum.

Communications. Rapid development of transportation facilities has accompanied the exploitation of the natural resources of interior Africa. In the Sudan, a new line was completed in 1929 from Port Sudan, via Kassala, to Senar on the Blue Nile. Tapping a large region to the south of the Port Sudan-Atbara route, this line provides transportation facilities for this fertile but undeveloped agricultural district.

The railhead of an Italian line has passed Agordat in Eritrea and is approaching Kassala.

In Northwest Africa, military efforts for the promotion of peace and the subsequent economic development of the country have resulted in the construction of an extensive railway net reaching from Casablanca on the Atlantic to the Gulf of Gabes. Spurs extend northward to the principal Mediterranean ports and southward into the Sahara. The recent completion of the Tangier-Fez Railway greatly facilitates communication with Europe.

West African railroads may be generally characterized as extending north from the Gulf of Guinea to the Niger River. The major lines are from Dakar (Senegal) to the Niger, from Kankan (French Guinea) to Kankan on a tributary of the Niger, the northward extensions of the Ivory Coast, Gold Coast, and Dahomey lines and the extensive loop route in Nigeria.

The commercial exploitation of the mineralized areas of Katanga (Belgian Congo) and of Northern Rhodesia has led to two of the most significant railroad developments in the history of African transportation. For some time, Katanga minerals were exported from the several east coast ports via a complicated rail and water route to Dar es Salaam or via Livingstone and the South African railway net. In 1928 the line to Bukama was extended to Ilebo on the Kasai River greatly shortening the river journey to the mouth of the Congo and involving only one transshipment. The gauge of this line conforms with that of the South African railways, since it is planned to continue the line to the mouth of the Congo and to allow future uninterrupted travel from Cape Town to Matadi. The second significant line is the Benguela Railway which is completed from Lobito to the Angola frontier. Union of this line with the Katanga Railroad will provide for South African railways the long-needed outlet on the west coast.

East Africa is connected with the Congo and South Africa by water from Bukama to Kabalo, by rail to Albertville, by ferry across Lake Tanganyika, and thence by rail to Dar es Salaam.



A northward extension of the Tanganyika Railway from Tabora to Lake Victoria has made it possible, by crossing this lake, to travel from Jinja or Kisumu, through Kenya Colony to Mombassa.

Thus, the east and west communications in South and Central Africa are developing rapidly. The two great military projects—the Cape-to-Cairo and the Trans-Sahara railways—have not been achieved. The former has gaps in Uganda and the Sudan; the latter has not been commenced, although surveys are continuing.

Settled areas are now provided with motor roads and South Africa, Rhodesia, and East Africa are served by a network of fair highways. This also is true in Northwest Africa. Regular motor schedules are followed on the Nile-Congo road from Stanleyville to Rejai.

Air transport has great possibilities in Africa where large stretches separate centres of activity. In 1926 Sir Alan Cobham, on a round trip from England to Cape Town, demonstrated the practicability of this mode of transport. Since then, numerous long flights have been made, notably one by Lady Bailey who, alone and without elaborate preparation, flew a small plane to the Cape from England and returned via the west coast. European nations are rapidly establishing air communications with their colonies.

**History.** The map of Africa, subsequent to the World War, was subjected to many changes as a result of that struggle. Shortly after the outbreak of the hostilities in Europe, Belgium inquired of France and Great Britain whether they intended to maintain the neutrality of territories in the conventional basin of the Congo, in accordance with the General Act of the Berlin Conference, of Feb. 26, 1885; the German government, likewise, proposed the maintenance of neutrality in this region, on the ground that solidarity of the white race was necessary to preserve European ascendancy in Africa. Great Britain and France, having already begun hostilities against the German colonies, declined the German offer of neutrality, and proceeded, with some aid from the Belgian Congo, to conquer the German possessions. British forces from the Gold Coast and French from Dahomey mastered Togoland in August, 1914, German Southwest Africa was successfully invaded in September, 1914, and occupied before July, 1915, by British South African troops. French and British columns, convergently penetrating Kamerun, completed the conquest of that colony in the spring of 1910, after encountering stubborn resistance. German East Africa, resolutely defended by a small German garrison supplemented by native contingents, was not swept clear of German forces until November, 1917, and then only after an ambitious plan of invasion, designed by General Smuts, had been carried out by British, South African, Indian, and native troops and coöperating Belgian forces. During the War, France and Great Britain by secret agreements arranged in advance the partition of the German colonies, and by the Treaty of London (1915) they promised Italy an extension of territory in Africa if they should be successful in their plans.

The Treaty of Versailles (1919) required Germany to surrender all overseas possessions to the principal allied and associated powers, transferred all German public property in the colonies to the new possessors, exacted reparation for damage done to French nationals by

German encroachments in French Equatorial Africa before the War, and compelled Germany to relinquish all former treaty rights in the French protectorate of Morocco. The Treaty further provided that Togoland, Kamerun, and German East Africa should be Class B mandates, with safeguards of native rights and of the open door, whereas German Southwest Africa should belong to Class C, to be administered as an integral part of the mandatory; but the distribution of these mandates was left to the allied powers. A preliminary division of the territories was effected by the Supreme Council on May 7, 1919, as follows: German East Africa to Great Britain; German Southwest Africa to the Union of South Africa; Togoland and Kamerun to be disposed of by Great Britain and France. Subsequently, the districts of Ruanda and Urundi, in the northwestern part of East Africa, were assigned to Belgium as mandatory; and the remaining nineteen-twentieths of East Africa, under the new name of Tanganyika Territory, became a British mandate. Of the Cameroons (former Kamerun), about five-sixths went to France, and only a small strip along the Nigerian border to Britain. Togoland was split, France taking almost two-thirds and Britain a little more than one-third. The mandate for German Southwest Africa (now Southwest Africa Protectorate) was formally approved by the Council of the League on Dec. 17, 1920; the Class B mandates for the other German Colonies, divided as described, were delayed until July 20, 1922. Other minor adjustments were made. Portugal recovered a district known as the Kiunga triangle, which had been included in German East Africa. In order to insure an unbroken route for the Cape-to-Cairo Railway, Belgium transferred to Britain a strip of Ruanda-Urundi. Moreover, in fulfilment of the Treaty of London, by which Italy had been promised compensation for Anglo-French gains, territorial concessions were made to Italy. Italy had desired territorial additions in French Somaliland (particularly Jibuti); the extension of Tripoli to Lake Chad; rectifications in the Libyan Desert in the neighborhood of the oasis of Jarabaib; and the addition of territory along the Juba River. France ceded to Italy the Ghadames and Trummo districts on the western border of Italian Libya; further than this, France declined to go. Egypt, at Britain's behest, transferred a long, narrow strip, the Jarabaib region, to extend the eastern frontier of Libya. But when Egypt became independent, she insisted that the agreement did not bind her, and the Italian possession of the strip was not finally established until December, 1925. Great Britain expressed herself in 1919 as willing to make concessions to Italy by additions to Italian Somaliland, but the Italian demand for more territory left the question open. In 1924 Ramsay MacDonald declared for the English government that it, like the former Baldwin government, planned to link the disposition of Jubaland with that of the Dodecanese, and inasmuch as Italy had received the latter by the Treaty of Lausanne (1923), there was little likelihood of any favorable settlement being reached, at least as far as Italy was concerned. But in June, an amicable settlement was reached when the 1919 Milner-Scialoja line was accepted. Late in 1923 Italian ambitions encountered another setback in the discussions over the status of Tangier when Great Britain, France, and Spain agreed upon a convention which repealed

the capitulations under which the port had been previously governed. Spain, however, was dissatisfied, and in the next few years continually pressed for the inclusion of Tangier in the Spanish zone of influence, a concession which England and France would not grant. Italy's claims likewise became more insistent.

Early in 1928, France and Spain reached an agreement and these two powers, with England and Italy, then met in a conference (Mar. 20). This continued until July 17, when an agreement was signed which acknowledged Italian claims for participation in the administration and development of the port. In Morocco the several years of fighting between the Spanish and, later, the French, on the one side and on the other the Riff and other tribes, which ended with the defeat and banishment of Abd-el-Krim in 1926, brought an agreement between France and Spain in 1926 providing for patrol of the coast to prevent smuggling of arms and ammunition, and for delimiting the boundary between the two protectorates.

Among other territorial changes were the settlement of the boundary between Wadai and Darfur in 1921 by France and Great Britain and the independence of Egypt. Egypt in December, 1914, first became a British Protectorate, and then, on Feb. 28, 1922, gained its independence under its own king and legislative assembly. The disposition of the Anglo-Egyptian Sudan, a source of contention between Britain and Egypt, was affected in 1924 by the murder of Sir Lee Stack, Sirdar and Governor General for the Sudan. Among the demands in the ensuing British ultimatum was one for the withdrawal of all Egyptian officers and purely Egyptian military units from the Sudan. This was followed by the organization of a Defense Force to replace the Egyptian Army there. The boundary between the Anglo-Egyptian Sudan and French Equatorial Africa was agreed upon in a protocol Feb. 28, 1924.

In 1925 the Southwest Protectorate, formerly German Southwest Africa, was accorded local self-government through provision for a legislative assembly, an executive committee, and an advisory council, which began functioning the next year. A long-standing boundary dispute with Portugal was decided in favor of the latter country by a mixed commission in 1926. The status of a mandated territory was maintained for the protectorate, the Permanent Mandates Commission of the League of Nations taking exception to a phrase in the boundary convention implying union sovereignty over the territory.

Thus the World War and its aftermath saw the elimination of the German territories, covering an area of 1,030,000 square miles, and the re-partitioning of Africa along the following lines:

Countries	Area square miles
Great Britain (not including Egypt)	4,014,000
France	4,245,000
Italy	591,000
Spain	129,000
Belgium	910,000
Portugal	927,000
Egypt	350,000
Abyssinia	350,000
Liberia	40,000

Like other parts of the world after the War, Africa became the scene of nationalistic aspirations, which threatened white supremacy. Of

the Egyptians' successful fight for native sovereignty, an account is given under EGYPT; the contest between Indians and British in the Kenya Colony is recounted under KENYA; the Union of South Africa's determination to check the economic and political aspirations of the Negroes and Indians (largely the work of General Smuts) is told under SOUTH AFRICA, UNION OF. As far as the Europeans were concerned, a more disquieting movement was that of the Negroes of the continent to gain a fuller hearing for their demands for racial equality. In 1919, 1921, and 1923, representatives of Negro groups in America and Africa, more particularly from the latter, met in Paris, London, and Lisbon, under the aegis of the Pan-African Congress, and there set out a charter of liberties for their people. Their purpose was plainly the development of Africa for the benefit of Africans, and not merely for the profit of the Europeans. They sought political, educational, and economic equality, the restoration of native lands, e.g., in Kenya, Rhodesia, and South Africa; the curbing of commercial exploitation in the Belgian Congo; release from the hold of large industrial monopolies in Portuguese East Africa, where, it was claimed, the activities of a British-financed company rendered nugatory the good intentions of the liberal Portuguese code; and the appointments by the League of Nations of direct diplomatic representatives in the mandated territories with powers to investigate and report. It was too early to ascertain whether the movement was gaining strength. In the 1921 Congress, 30 countries were represented as against only 13 in the 1923 Congress. But its implications indicated a serious challenge to the purposes of European imperialism. The cry of "Africa for the whites" was being met by that of "Africa for the Africans."

**AFRICA, EARLY CIVILIZATION OF.** See ETHNOGRAPHY.

**AGAR, FREDERICK ALFRED** (1872- ). An American clergyman and writer, born in London, England. He went to the United States in 1889. He studied at the Louisville Theological Seminary and was ordained a Baptist minister in 1893. He was a medical missionary to the Congo Free State (1893-94) and after holding various pastorates and the superintendency of missions in Montana, Washington, and Idaho (1904-12), he became efficiency and methods secretary of the Northern Baptist Convention in 1913. He became a specialist in church methods and is author of *Church Finance* (1915); *Dead or Alive* (1916); *Help Those Women* (1917); *Personality and Possessions* (1917); *Democracy and the Church* (1918); *Church Officers* (1918); *The Stewardship of Life* (1919); *Modern Money Methods* (1920); *Manual of Church Methods* (1921); *The Deacon at Work* (1922); *The Competent Church* (1924); *The Local Church* (1926); and technical pamphlets upon church methods.

**AGUE, ALVA** (1858- ). An American agricultural educator, born at Cheshire, Ohio. He attended Marietta College and the University of Wooster. From 1907 to 1912, he was professor in charge of agricultural extension work at the Pennsylvania State College and, from 1912 to 1918, performed the same service and was professor of soil fertility at Rutgers College. He became associate editor of the *National Stockman and Farmer* and since 1890 has contributed many articles on agriculture to periodicals. He

has also lectured on agricultural topics since 1891. From 1910 to 1925, he was secretary of agriculture for the New Jersey State Department of Agriculture. He wrote *Essentials of Soil Fertility; Crops and Methods for Soil Improvement; Right Use of Lime in Soil Improvement*, and *First Steps in Farming*.

**AGEE, FANNIE HEASLIP LEA (1834- )**. An American author, born at New Orleans and educated at Tulane University. She has been a frequent contributor to American magazines and wrote: *Quicksands* (1911), *The Jaconette Stories* (1912), *Sicily Ann* (1914), and *Chloe Malone* (1916).

**AGER, WALDEMAR (THEODOR) (1800- )**. A Norwegian-American editor and author, born in Fredrikstad, Norway, and educated in the common schools. He went to America in 1835. He joined the Fremad Publishing Company, Eau Claire, Wis., in 1892, and in 1903 was appointed treasurer and editor of *Reform*, a weekly. He was also made secretary of the Norwegian Society of America and editor of its quarterly. He is the author of *Kristus for Pilatus* (1911); *Paa veien til smeltepotten* (1917); *Sons of the Old Country* (1926), and short stories and histories in Norwegian. He is also known as a lecturer. He was made a knight of the Norwegian Order of Saint Olaf in 1923.

**AGNES SCOTT COLLEGE**. An institution for women at Decatur, Ga., founded in 1889. The student enrollment increased from 225 in 1914 to 470 in 1927-28, and the number on the teaching staff from 35 to 60 in the autumn of 1928. The endowment was increased from \$175,000 in 1914 to \$1,165,000 in 1928 and the income from \$100,000 in 1914 to \$325,000 for the session 1927-28. The volumes in the library during the same period increased from 4000 to 19,000 volumes; the land holdings of the college were more than doubled and a number of new buildings were constructed, including a gymnasium and health centre; and plans were projected for raising funds for additional buildings. President, James Ross McCain, Ph.D., LL.D.

**AGNEW, WILLIAM HENRY (1881- )**. An American clergyman and educator, born in Westphalia, Kan., and educated at St. Louis University. He joined the Society of Jesus in 1900, and was ordained priest in the Roman Catholic Church in 1915. He served as dean of the department of science and mathematics at Loyola University, Chicago, Ill., for four years, and in a similar capacity at St. Louis University for one year. Then, from 1919-20, he was professor of natural theology at St. Louis University, before becoming president of Loyola University in 1921. At various times, he was chaplain of public institutions in Chicago and New York. He lectured widely at religious and educational institutions and was at one time editor of *The Queen's Work*, a magazine.

**AGRICULTURAL CREDIT**. This term has come into prominence within recent years in several distinct senses, among which may be recognized: rural credit (mortgage-bond loans); marketing credit (loans for the sale and carrying of farm products); and productive credit (loans made for farmers' expenses during the period of putting in and harvesting crops). Due partly to the growth of an agrarian movement in many quarters and partly to the unsatisfactory position of the farmer as the result of the changes in prices during and since the World War, the problem of furnishing the farmer with an ade-

quate mechanism for supplying these different kinds of credit has become a political issue in several countries and particularly in the United States.

**Rural Credit**. By rural credit is meant the extension of loans to working farmers for the purpose primarily of improving their land and of equipping them with suitable farm buildings and in some cases with the more permanent and lasting types of machinery. Since the farmer has usually little or nothing upon which to base his application for credit except the title to his land, this form of agricultural credit becomes a system of advancing money upon farm mortgage. Since farm mortgages are costly and difficult to supervise and crop failures suspend interest payments and sometimes necessitate the surrender of title to the land, mortgage banking has been developed in connection with agricultural operations and has been worked out on the cooperative principle, which is intended to put behind the loan the protection of a joint guarantee derived from claims upon a considerable number of pieces of property. This plan of cooperative mortgage banking was first developed in Germany and came into definite existence about 1775, continuing in various forms since that date. Parallel systems have been introduced into nearly all of the European countries and some Oriental states, with varying success. The typical form of the plan is found in an organization of cooperative groups or associations whose members' applications for loans are passed on by their neighbors or associates in the group. Under the German plan, the next step is the issue of a bond or obligation which is jointly binding on all members of the group and their lands, and which the recipient, the applicant for the loan, then sells to as good advantage as he can. Mortgage banks have been established for the purpose of assisting in this marketing process. Under other variations of the scheme, the recipient obtains his loan in money, mortgaging his land to the cooperative association, which is organized with a small capital. The association then sells the mortgage to a land bank which places it and a series of other mortgages given by contemporary borrowers in a pool or trust fund. Bonds against these mortgages are sold to investors; thus, the mortgages serve as collateral to protect the bonds.

**Federal Farm Loan Act**. The Federal Farm Loan Act adopted in 1916 by Congress is based upon the last-described form of the cooperative mortgage system. Farm loan associations are formed in designated areas under conditions prescribed in the law, and their members are borrowers only. The borrowers submit applications for loans under specified conditions and restrictions as to size, security, and valuation of the land. When such loans are approved by the association after careful appraisal of the property, the mortgages are transferred to a Federal land bank. Twelve of these banks have been organized in districts covering the whole of the Continental United States. They sell bonds issued in series against the mortgages which they have thus purchased. All bonds are guaranteed by the twelve banks. The Federal Farm Loan Board, an appointive body in the Treasury at Washington, supervises the operations of the loan associations and the banks and assents to or rejects applications for the issue of bonds. During the period from 1916 to early in 1928, about 4057 farm loan organizations were formed,



while at the latter date 4669 remained in operation and, under the cooperative principle, the capital of the land banks was increased with the loan associations, which take out capital in proportion as they sell mortgages to the land banks. Thus, a total of about \$1,161,000,000 of bonds has been placed in the hands of the public by the twelve banks. Under the Federal Farm Loan Act, provision also was made for institutions known as Joint Stock Land Banks. These were to operate in somewhat the same way as the Federal land banks, except that the former were originally founded with government capital and were steadily overseen by the Government. The Joint Stock Land Banks were to be organized with private capital and were to make mortgage loans direct to farmers, instead of following the same procedure as in the case of the farm land banks, purchasing the mortgages from local loan associations, which obtained them from the farm borrowers who were their members. The Joint Stock Land Banks early in 1928 numbered about fifty. The total issues of bonds put out by them up to June 30, 1928, was about \$592,000,000. In general, the effect of the Farm Loan Act was undoubtedly to reduce the average rate of interest on first-class landed security from  $5\frac{1}{4}$  to 5 per cent, according to location; and it thus tended to establish a comparatively high degree of uniformity between different parts of the country. Of the Joint Stock Land Banks, at one time numbering about fifty-four, two have had to be placed in receivers' hands, while two were merged with other banks, during the fiscal year 1928. One of the remaining fifty banks was in process of voluntary liquidation.

**Intermediate Credit Banks.** Because farm land banks and joint stock land banks were strictly limited to mortgage security, i.e. first mortgages on farm lands, and were not authorized to make any extensions of funds for conducting agricultural business, sharp demand arose in the United States in the years 1920-22 for some system of banking which would provide for loans running up to two or three years in maturity protected by ordinary paper or chattel mortgages. Such loans were especially designed to meet the requirements of the cattle- and wool-raising industries and to some extent for the use of fruit growers and others who required period loans of a duration greater than could be obtained from the ordinary bank and shorter than those contemplated by the land mortgage act. On Mar. 4, 1923, Congress accordingly provided for the creation of twelve intermediate credit banks to be operated in connection with, or as departments of, the twelve land banks. Each was to have a capital of not more than \$5,000,000, the actual amount to be determined by the Secretary of the Treasury and paid in by him out of any funds in the Treasury not otherwise appropriated. Each bank was to be allowed to do business with ordinary banks and with loan associations and corporate lenders of various kinds. It was to be permitted to place its securities in trust, to issue tax exempt debentures, and to sell these to the public in an amount not to exceed twelve times its capital stock. Such debentures were to be purchasable by Federal Reserve Banks. In lieu of issuing debentures, the intermediate banks might make acceptances against commodities in warehouses; and such acceptances might be discounted with Federal Reserve Banks, so as to give the farmer access to the commercial banking funds of the

country under specified conditions. In 1923 these banks were organized with a capital of \$1,500,000 each. Later, however, the paid-in capital was increased to \$2,000,000 in all save one case where an additional \$1,000,000 was paid in on account of losses. At the opening of 1928, total discounts by the 12 banks had been \$257,000,000 of which about \$76,000,000 were outstanding.

**War Finance Corporation.** During the World War, the War Finance Corporation was formed in the United States, whose purpose it was to make loans to hard-pressed enterprises which might be unable to obtain banking accommodation through ordinary channels. The concern had a nominal capital of \$500,000,000 paid out of the Treasury. It did a limited amount of business during the War, but after the close of the struggle it was largely liquidated and practically closed under the Administration of Secretary of the Treasury Houston. The Harding administration which came into office in 1921 expanded and revived the operations of the concern and devoted it largely to agricultural relief with direct loans to banks and under certain conditions to corporations, for the purpose of promoting export trade and enabling banks with frozen assets to obtain assistance on a long-term basis on a larger scale than they otherwise could. The War Finance Corporation was extended from time to time, with operations during its entire life of \$691,000,000 of which \$688,000,000 was repaid. When the intermediate credit banks were organized, it was supposed that they would take over the business of the War Finance Corporation, but they did not prove able to do so, owing to the less flexible conditions under which they operated. The result was successive extensions of the life of the corporation to Jan. 1, 1925, where it was placed in liquidation, notwithstanding a technical duration of its charter to Apr. 4, 1929. During the later years of the corporation, its activity was largely sporadic, being intended for the relief of hard-pressed banks in various parts of the country which were suffering from agricultural depressions.

**Federal Reserve Operations.** None of the long-term or intermediate mortgage-banking enterprises already referred to has any bearing on the question of currently financing the farmers' crops. For many years, this matter had presented serious difficulties in the United States, largely because so great a proportion of American agriculture is of a seasonal nature. Cotton, for example, which comes to maturity and is practically all gathered in by the middle of November, must be financed over the period during which it is to be consumed either at home or in the course of the exporting period. That is to say, funds must be provided from some source with which to pay producing and harvesting expenses, and other obligations incurred by the farmer during the growing season. If he sells the cotton, he is able to pay his expenses out of the proceeds so far as they go. Observation, however, has led some to think that the lowest prices of the year prevail for some weeks immediately after the peak for the harvesting season. Hence, there was a desire to put the farmer into a position to carry his crop until it could be gradually sold at a price up to the average. This gave rise to the establishment of Federal warehouses and also to the adoption of State warehouse systems operating under a uni-

form warehouse law. It also led to the creation of cooperative marketing associations whose function is to receive the cotton from their members, store it, and carry it until favorable opportunity for selling presents itself. In order to carry the crop in this way, the farmer or the cooperative associations must be able to obtain satisfactory accommodation at the banks, and in order to insure such accommodation, the Federal Reserve Act made provision for an unusually long period of credit on farm paper, six months instead of three, and also contemplated the use of the resources of the system so far as needed for the orderly marketing of crops. Under the administration of the Federal Reserve Board, this idea of orderly marketing came to signify the holding of the crop during the consumption period, with the understanding that it should all be placed on the market prior to the advent of a new crop. What is said here of cotton applies also to other staples, and is a general characterization of the crop-moving problem at large. The working of the Federal Reserve system in connection with short-term farm paper has been satisfactory as far as it goes, enabling the agriculturist to get at low rates all of the funds to which he could be considered reasonably entitled. Such success has been, of course, much furthered by the cooperation of the commercial banks.

**Agrarian Discontent.** Very decided agrarian discontent has prevailed in the United States for several years past. One reason for it was the artificially high prices that were fixed for food-stuffs during the War. These tended to encourage farmers to bring too much land under cultivation for certain crops and to neglect the diversification of certain products. They also tended to encourage a speculative movement and inflated level of values in the farming community, with the result that many cultivators purchased or in some way took over land at valuations which could not thereafter be maintained. After the close of the War, the fixed prices for agricultural products were terminated and a considerable slump in farm prices and values set in. This reaction was by many ascribed to deflation, an effort on the part of the banks and especially of the Federal Reserve system, to curtail the amount of credit going to the farmer. One outcome of this discontent was the so-called agricultural inquiry of 1921, conducted by a joint committee representing the House and Senate. The findings of the committee exonerated the system for its discount policy but blamed it for allowing expansion to occur as rapidly as it had, notwithstanding that the inevitable result was reaction and deflation. Dissatisfaction continued throughout the Northwest and some parts of the Middle West, and the result was steady agitation in Congress and out of it for some sort of relief. One result of the agitation was the Intermediate Credits Act of Mar. 4, 1923, already described.

The results of the Intermediate Credits Act, however, proved disappointing. Congress had already endeavored to mitigate the discontent of the farmer by giving him higher tariff rates, in the Tariff Law of 1922, and these tariff rates were subsequently raised still further through presidential action under the so-called flexible tariff provision of the Act of 1922. However, the results of tariff advances were not encouraging. Farm prices actually went lower after the adoption of the Tariff Act than they had been before it, and there was a widespread feeling

throughout the farming regions that the producer had in some way been duped. Actual conditions during the years 1922-27 were, in many parts of the country, bad, and it is estimated that during those years fully 1,000,000 farm workers transferred themselves to the cities because of the attractiveness of the higher wages paid in factory employment as compared with the poor return obtained on the farm. Another outcome of the discontent was a widespread conversion of land from the single crop plan to diversified farming. Nevertheless, discontent continued and out of it there developed a demand for some method of fixing farm prices at higher levels.

Such a method took shape in the so-called McNary-Haugen Bill which was prominent in Congress during the years 1927 and 1928 and was twice vetoed by President Coolidge. The bill essentially provided for a government price fixing of farm products through the extension of credit to farm organizations which were to buy and hold surplus crops, thus keeping them off the market until they could be exported, and establishing a home price for them higher than the foreign price by the amount of our tariff rates. The farm-credit and farm-relief problems were an important issue in the presidential campaign of 1928; and Mr. Hoover, who was elected in the autumn of 1928, recognized the state of feeling by promising an extra session of Congress to be held immediately after his assumption of office Mar. 4, 1929, and to be especially charged with the duty of dealing with the farm question, particularly from the standpoint of prices and credit. This was duly assembled.

**Farm Cooperation.** What has seemed likely to be a practical development in the field of agricultural credit and at the same time a quite helpful measure from the standpoint of the farmer himself is the development of cooperative credit associations with cooperative marketing associations.

The method of the cooperative association is to exact from its members an agreement to keep a specified amount of land under cultivation for a certain kind of crop over a given period of years or, at all events, to cultivate no other crop on that land, thus assuring a steady supply of the product in question. The farmer agrees to deliver his output through the association and to abide by its rules, which provide for grading, holding, and selling the product under conditions determined by the board of directors and other authorities. The association then provides for financing and carrying the combined output furnished by its members. This financing has been done in two principal ways; by direct loan at banks with warehouse receipts, representing the title to the cotton as collateral, and by acceptances furnished by banks with which arrangements have previously been made. The acceptances are protected by warehouse receipts in the same way and then marketed by the association, or in some cases by the accepting bank. The best of these agreements provides also for regular marketing of the warehoused crop at a specified rate per month and reduction of the outstanding acceptances in corresponding amount. This method has provided an economical and apparently very safe form of financing. But, in spite of a promising early growth, the cooperative associations have failed to advance in strength and numbers save in special regions. See COÖPERATION.

**Future of Farm Credit.** The discussion since 1920 in the United States and elsewhere confirms the opinion that sound farm credit can be based only on careful adjustment of acreage to demand and that the holding or storage of surplus products merely intensifies the problem of prices at a later date, even though it may temporarily advance them. The passage of special "relief" laws has become the basis of a movement represented by the so-called farm bloc in the Senate and by similar organizations in foreign legislative bodies. Improvement of marketing methods and facilities and elimination of middlemen's charges both for selling and financing appear to offer perhaps the best solution of the problem. See FINANCE AND BANKING, AGRICULTURE.

**AGRICULTURAL EDUCATION.** From 1910 agricultural education in the United States broadened greatly, in research, graduate and undergraduate work in colleges, courses in secondary and elementary schools and extension work. A larger measure of public funds was devoted to these enterprises than previously, and a considerable number of private institutions were devoted to the work. The interest of the farming folk in agricultural education was sharpened and found new expression through their organizations. The American system was profoundly strengthened by the operation of the Smith-Lever Cooperative Extension Act of May 8, 1914 (see AGRICULTURAL EXTENSION WORK), and the Smith-Hughes Vocational Education Act of Feb. 23, 1917. The U. S. Department of Agriculture and the agricultural experiment stations (q.v.), which with few exceptions were departments of the agricultural colleges, supplied more largely the new information on which improvement in the subject-matter of agricultural teaching was based.

**The Agricultural Colleges.** In 1928 instruction in agriculture was given in 51 land-grant colleges for white students in the 48 States, Alaska, Hawaii, and Porto Rico, 28 of these in connection with State universities. It was also featured in 17 institutions for Negroes in the Southern States.

The number of students in four-year undergraduate courses in agriculture (including forestry and veterinary science) reached its peak in 1915 when there were 17,169. In 1919 it declined to 10,345, rose to 15,477 in 1922, and declined to 12,957 in 1926 owing to agricultural depression. There were also large numbers of students in subcollegiate work, including short courses, summer schools, and correspondence courses, and a considerable number in graduate courses. In 1926, 2054 men and 73 women were granted bachelors' degrees in agriculture, and 358 students were given masters' degrees. Seven universities and the Massachusetts Agricultural College granted doctors' degrees to 34 students specializing in agricultural subjects.

In the land-grant colleges for Negroes, in 1926, there were 13,259 students, of whom 795 were in secondary courses and 208 in collegiate courses in agriculture.

The Federal appropriations for instruction in the land-grant colleges were increased under the provision in the Vocational Education Act for teacher-training and temporarily by the Federal acts for Rehabilitation of Veterans of the World War. But by far the greatest increase of revenue came to these colleges through State appropriations for buildings, equipment, and current ex-

penses. The agricultural divisions of these colleges received a good portion of these funds. Many large buildings for agricultural work were erected and well equipped. Additional farms, live stock, machinery, libraries, etc., were purchased. The number and variety of courses were greatly increased. The courses in agricultural production under the heads of agronomy, horticulture, forestry, animal husbandry, and dairying were strengthened in various ways, but much emphasis was increasingly placed on the development of courses in rural engineering and in rural economics and sociology.

The Graduate School of Agriculture under the auspices of the Land Grant College Association was held in 1914 at the University of Missouri and in 1916 at the Massachusetts Agricultural College, after which it was discontinued. This was largely due to the development of regular graduate courses leading to advanced degrees at most of the agricultural colleges and particularly at universities and the stronger colleges. In the undergraduate work, special attention has been paid to better organization of the curriculum, the adoption of a group system of electives, provisions to meet the needs of individual students according to their interests and capabilities, promotion of better teaching, and recognition of the importance of expert supervision of the educational work as a whole by the appointment of directors of resident teaching or similar officers. College authorities generally agreed that, during the first two years in college, students should be required to take general basic courses, including a technical knowledge of what the farmer needs to know in order to carry on his work intelligently. The specialization through group courses could then be undertaken at the beginning of the junior year.

By 1922 all the land-grant colleges had departments offering courses in general psychology, educational psychology, methods of teaching, and other professional studies. A number of them had courses in methods of teaching agriculture. The training of teachers of agriculture for the secondary schools under the Smith-Hughes Vocational Education Act was committed to the land-grant colleges. They also had become interested in the professional training of the college teachers. The Association of Land Grant Colleges and Universities, through its committee on instruction in agriculture, home economics and mechanic arts, urged that instructors in the technical department pursue graduate work in education and study the problems of teaching in their respective fields. Heads of departments were asked to guide young teachers and give them opportunity to teach a variety of subjects and to commit the teaching of introductory and basic subjects to experienced and successful teachers. The association also adopted a recommendation that beginning with 1925 candidates for teaching positions in the colleges be required to have professional training.

**The School of Agriculture for the American Expeditionary Force in the World War.** In 1919 a unique educational enterprise was undertaken for the benefit of the American soldiers in France. This was planned and inaugurated by the Young Men's Christian Association, and afterwards was taken over by the Army Education Commission. This plan included a college of agriculture located at Beaune which enrolled 6000 students and a nearby farm school at Allery with 2600 more. Thorough extension work

courses in agriculture were carried to thousands of soldiers in practically every regiment. Numerous trips to French farms and forests supplemented the class-room work. In charge was President K. L. Butterfield of the Massachusetts Agricultural College, with whom were associated a large number of the ablest agricultural educators from the colleges throughout the United States. More than 150 were selected from the Army, representing 40 agricultural colleges.

**Agricultural Training for Disabled Ex-Service Men.** Under the Vocational Rehabilitation Act of June 27, 1918, the Federal Board for Vocational Education included agriculture in its programme for training disabled ex-service men. In 1921 the rehabilitation work was transferred to the Veterans' Bureau. Up to June 30, 1921, about 15,000 men took advantage of such training. They were distributed among the agricultural colleges and schools. Some of them could join the regular classes, but for the most part their general education was too limited to permit this and special instruction had to be given them. During the fiscal year 1922-23, more than 11,000 men were given training in agriculture. Of these, about 2000 were pursuing college courses leading to a degree, about 4000 were taking shorter college courses, and about 5000 were in special practical courses. Thousands of farms and other agricultural enterprises were utilized as placement and project training opportunities for men on the job. This method proved more effective than institutional training, especially for men of limited education, and their health was improved. The rehabilitation work came to an end July 2, 1928.

**Secondary Education in Agriculture.** In 1928 there were some 170 special agricultural schools, and agriculture was being taught in about 5000 high schools. About 3550 of these schools received Federal and State funds under the provision of the Smith-Hughes Vocational Education Act of Feb. 23, 1917. This act was administered by the Federal Board for Vocational Education, which had a division for agricultural education, and by State boards in all the States. Plans for the work in agriculture, as in other subjects, were initiated in the States and approved by the Federal Board as the basis for allotment of Federal funds. The instruction was for students from 14 years of age. Supervised practice work in agriculture during six months of each year was required of all students.

The Federal funds for vocational instruction in agriculture increased from \$547,027 in 1918 to \$3,031,987 in 1928, and were offset by more than this amount of the State and local funds. In 1918 vocational agriculture was taught in 609 schools by 895 teachers to 15,453 pupils and in 1928 in 3553 schools by 3853 teachers. There were 94,730 boys and 2662 girls studying agriculture in the all-day schools and there were 41,553 students in evening and part-time classes. Experience showed the advantage of connecting the Smith-Hughes work in agriculture with the local high schools, because thus the pupils lived at home and as a rule carried on their practice work on the home farm. This also made the school a factor in improving the agriculture of the local community. The agricultural instruction in the Smith-Hughes schools was largely conducted on a project basis. This led to an attempt by the Federal Board, in cooperation with the division of agricultural instruction in the Department of Agriculture, to make job an-

alyses of the different agricultural enterprises and several publications were issued showing how such analyses may be used in the teaching of agricultural subjects.

**Elementary Agricultural Education in the United States.** In 28 States, there are laws requiring elementary agriculture to be taught in the rural schools, and several others encourage such teaching. In about 20 States, elementary agriculture and nature study are taught effectively in many rural schools, especially consolidated schools. A number of State departments of education have published outline courses in elementary agriculture for the use of teachers, partly by cooperation with the agricultural colleges and the U. S. Department of Agriculture. The agricultural colleges, through summer schools and in other ways, help to train teachers for this work. These colleges and the U. S. Department of Agriculture also aid the rural teachers by the distribution of publications, lantern slides and other illustrative material, and by personal services of the State and county extension agents. The boys' and girls' clubs organized by the extension agents are in many cases closely associated with the rural schools. Many normal schools and high schools have courses through which teachers are trained for work in agriculture and nature study in the rural schools.

**Other Countries.** Institutions for agricultural education are in operation in many countries, including colleges, secondary and practical schools, and special schools for horticulture, forestry, dairying, poultry, etc. In the European countries, the regular work of the agricultural institutions was greatly abridged during the World War, but at that time and afterward, special arrangements were made for the instruction of disabled soldiers in several countries. Since the War, considerable progress has been made in expanding and strengthening agricultural education in these countries. In Great Britain, the Development Commission under the law of 1909, in cooperation with the Ministry of Agriculture and Fisheries, has greatly stimulated agricultural education and research through the establishment of centres of research at the Rothamsted Experiment Station, at Cambridge, Oxford, and other universities and colleges, promotion of the resident teaching at these and other institutions, assistance to local authorities in maintaining short courses of 10 to 12 weeks (called farm institutes) by itinerant teachers and broadening of the extension work through county representatives and other expert advisory officers. For this work, Parliament has made large grants of money to supplement local funds.

In Canada, agricultural colleges and the teaching of agriculture in many high, consolidated, and elementary schools are maintained in all the provinces under the direction of provincial departments of agriculture and education, aided by the Dominion Department of Agriculture. In 1917 the Agricultural Instruction Act, providing for district extension agents, made special arrangements for instruction of convalescent soldiers by these agents. At St. Joseph, Trinidad, the West Indian Agricultural College was opened for students, Oct. 16, 1922. It has served as a centre for research and education in tropical agriculture. The Imperial Department of Agriculture for the West Indies was transferred from Barbados and located at this college.

In Belgium, a royal decree of Apr. 8, 1920, reorganized the higher agricultural education.

The course for a bachelor's degree was to occupy four years, but a license in agricultural science could be obtained on completion of a two years' course. A higher normal institute of farm management has been established at Laeken. In France, the law of Aug. 21, 1912, reorganized the department and communal system of agricultural education and provided a bureau of agricultural services for each department. Laws enacted in 1918 and 1920 further systematized agricultural education and provided better opportunities for specialization in different branches of agriculture, the training of teachers, winter courses for farmers, continuation courses for boys and girls leaving the primary schools and agricultural instruction for women.

In Denmark, agricultural education is given in the Royal Danish Agricultural College at Copenhagen, at which the regular course occupies two years, with additional special courses covering two more years; and in 22 agricultural schools, with nine months' courses and special shorter courses lasting from a few days to several weeks. In Norway, there are the Norwegian College of Agriculture, with a three years' course; the State Training School for Teachers to Small Holders, with a two years' course; and 42 county or district agricultural schools, with courses of 6 to 18 months, 8 schools of horticulture, 3 of forestry, and 4 of dairying. In Sweden there are agricultural colleges at Ultuna and Alnarp, 10 secondary agricultural schools, 33 farm schools with winter courses, and 4 schools of gardening and agriculture.

In China, an educational survey in 1916 showed the great need of more practical education and that year the National Association of Vocational Education was formed. The National Alliance of Provincial Educational Associations also favored vocational education. This movement greatly stimulated progress in agricultural education in colleges and secondary and primary schools.

An interesting development of agricultural education has been connected with missionary colleges and schools in several countries. Many mission boards are promoting this side of their work, and young men are being trained in colleges in the United States and elsewhere for it. A survey in Africa by the African Education Commission showed the importance of correlating missionary enterprises with the agricultural and community life of the African peoples, through practical instruction and extension work in connection with mission schools.

**AGRICULTURAL EXPERIMENT STATIONS.** These institutions, especially in the United States, were called into unusual service during the World War. To some extent, their researches received a temporary setback from the special demands upon their workers and the fact that many were drafted into war activities or accepted positions in the industries. After the Armistice, the forces gradually returned, the stations renewed their normal activities, and the State appropriations were increased to some extent. For several years, however, they suffered from the decreased purchasing power of their funds. The Federal appropriations remained unchanged, but by 1924 the resources from within the States had fully doubled compared with those in 1914. In addition to the main or central stations in each of the States, numerous substations were maintained for typical regions or the study of special branches of agriculture. Cooperation with the U. S. Department of Agriculture in-

creased quite steadily. An experiment station under the supervision of that Department was established in the Virgin Islands in 1918.

A new era of the experiment stations began with the passage of the Purnell Act Feb. 24, 1925. This Act not only substantially increased the Federal support but extended the recognized scope of the experiment stations to include agricultural economics, home economics, and rural sociology. These subjects were not mentioned in previous legislation, which had related primarily to subjects connected with agricultural production. The Purnell Act authorized an initial appropriation of \$20,000 for each State, in addition to the grants provided under the two previous acts, the amount to increase by \$10,000 annually until the total for each State aggregated \$60,000, in 1930. This, with the grants under the Hatch and Adams Acts, will provide \$90,000 a year to each State, or a total contribution from the Federal Government of \$4,320,000. These funds are under the administrative supervision of the Department of Agriculture. The growing interest in economic problems of agriculture was at once reflected in a marked expansion in that field, and investigations in home economics and rural sociology assumed a prominent place.

The total funds of the experiment stations in the United States for 1928 aggregated approximately \$14,000,000. These were used to some extent in the carrying on of farms and in control and service work, but were devoted in large measure to investigation. The stations employed 3000 persons in connection with their research and administrative activities, some of them likewise serving part time on the teaching staffs of the agricultural colleges. During the year 1928, over 1800 publications were issued, which were distributed widely through the States and to foreign countries. A growing part of the technical research was published in scientific journals which served to increase materially the volume of the output. The stations were carrying on a total of more than 7000 separate projects in 1928, covering practically every phase of the agricultural industry and rural life, varying from quite practical experiments to abstract inquiries on the frontiers of science. In most of the States, the investigation has become increasingly technical in order to meet the type of problem and the demand for accurate information.

Numerous new buildings and special facilities in which the experiment stations share were provided by the States. This has marked substantial enlargement and improvement of the facilities for agricultural research.

The Connecticut State Experiment Station observed its fiftieth anniversary in 1925 and the North Carolina Station, in 1928.

A system of forest experiment stations, supported by congressional appropriation, was inaugurated under the U. S. Department of Agriculture, beginning with 1922-23 (see **FORESTRY**). In addition to these public agencies, the Boyce Thompson Institute for Plant Research, supported privately, was opened at Yonkers, N. Y., in 1921. In the same year the Food Research Institute was established at Stanford University, with funds supplied by the Carnegie Corporation of New York, for the study of the scientific and economic aspects of food supply and use. The Giannini Foundation of Agricultural Economics was provided for in connection with the California College of Agriculture in 1928, with a contribution of \$1,500,000. Another special pro-



vision was a gift to the New York State College of Agriculture in 1927 by Charles Lathrop Pack for endowment and maintenance of a research professorship in forest soils. The Herman Frasch Foundation for Chemical Research, especially in agricultural chemistry, with a fund of \$1,000,000, was provided by the bequest of Mrs. Elizabeth Blee Frasch, and became operative in 1928.

In Great Britain, the repeal of the war-time measure known as the Corn Production Act was accompanied by the granting of £1,000,000 for agricultural education and research, about half of which has been allocated to research and advisory work among various institutions. A movement for enlarging agricultural research in the United Kingdom was set on foot by the recommendations of the Imperial Agricultural Research Conference in 1927. A new agency, known as the Rowett Research Institute, for work in animal nutrition especially, was organized at the North of Scotland College of Agriculture, contributions coming mainly from private sources. A National Poultry Institute was established in connection with the Harper-Adams Agricultural College in Shropshire. A cotton research station was provided for in Trinidad and, in India, a cotton laboratory was established. In Canada, the Dominion Government was compelled to withdraw its assistance to the experiment stations for a time after the War, but eventually the support was resumed and the stations are filling a very important part in developing the resources and extending the area of production in that country.

Despite the financial stress in France, an appropriation of 2,000,000 francs was made for experimental work in 1921, and an Institute of Agricultural Research was established under the Ministry of Agriculture, to which the existing stations and laboratories hitherto administered by the Department were assigned, with authority to establish other stations and make grants for research. This reorganization brought under the Institute 88 stations and laboratories with a total personnel of 236. A central station with regional stations for the improvement of crop plants was more recently provided for, and eight additional central stations with regional branches to deal with the principal divisions of agriculture.

The Australian Commonwealth adopted plans for locating one of its chain of research stations in Queensland, providing £50,000 for capital expenses and £10,000 annually for maintenance. The South Australian Agricultural Education Act of 1927 provided £5000 for the extension of research at the Waite Agricultural Research Institute, with increases expected to bring the amount up to £15,000 by 1936-37. An Institute for Rubber Research was incorporated by the Federated Malay States and established in 1927. An institute of agricultural research in Palestine, with a system of local stations, was planned under the Zionist movement. The State of Minas Geraes, Brazil, inaugurated a new institution for agricultural instruction and investigation, located at Vicosa; Colombia and Salvador each provided for a series of stations, and Venezuela opened a station for agriculture and forestry at Caracas. In Peru, the National Agricultural Society was organized in 1926, with plans for inaugurating an experiment station in the northern part and one in the southern part of the country, with several substations. A high altitude station was established in that country at 12,500 feet,

with a ranch of about 18,000 acres stocked with sheep and with modern equipment. In various other countries, new stations or additions to the systems already in existence were brought into action.

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**AGRICULTURAL EXTENSION WORK.** Agricultural extension work includes whatever instruction on subjects related to agriculture and country life is given by educational institutions to persons other than resident students. Most of this work is done away from the institutions, but it may include meetings or short courses held there. In the United States, courses at the institutions exceeding two weeks in duration are usually not classed as extension work. Most of the agricultural extension work in the United States is done cooperatively by the State agricultural colleges and the U. S. Department of Agriculture under the terms of the Smith-Lever Extension Act of 1914 and related Federal and State legislation. This act brought about a combination of three more or less distinct lines of institutions: (1) farmers' institutes (see article in *NEW INTERNATIONAL ENCYCLOPEDIA*); (2) farm demonstration work (see article in *NEW INTERNATIONAL ENCYCLOPEDIA*); and (3) the correspondence and short courses, lectures at farmers' meetings, exhibits at fairs, competitive judging of live stock and other products, etc., carried on by the agricultural colleges.

From the beginning, the agricultural colleges and the Department of Agriculture disseminated agricultural information among the farming people through correspondence, distribution of publications, and addresses at meetings by members of their staffs. The colleges gradually enlarged the scope of their extension work, particularly in the decade beginning about 1905, when extension divisions were organized. During this period, the work was considerably influenced by the general movement of university extension, of which it was often considered a part. In 1908 the colleges, through their Association, began to ask Federal aid for extension work and several bills were introduced in Congress. Finally, a bill, introduced by Hoke Smith of Georgia in the Senate and Asbury F. Lever of South Carolina in the House, was passed and was approved by President Wilson, May 8, 1914. This act provides for agricultural extension work to be carried on by the land-grant colleges in cooperation with the U. S. Department of Agriculture and

in accordance with plans annually submitted by the colleges and approved by the Secretary of Agriculture.

"Coöperative agricultural extension work shall consist of the giving of instruction and practical demonstrations in agriculture and home economics to persons not attending or resident in said colleges in the several communities, and imparting to such persons information on said subjects through field demonstrations, publications, and otherwise; and this work shall be carried on in such manner as may be mutually agreed upon by the Secretary of Agriculture and the State agricultural college or colleges receiving the benefits of this act."

To each State \$10,000 annually was permanently appropriated and additional sums beginning with \$600,000 in 1914 and increasing by \$500,000 for seven years thereafter, after which \$4,100,000 annually was to be permanently appropriated. Since 1920 supplementary funds were added by Congress. To receive the additional sums, the States were required to offset them with equal amounts, provided by States, county, college, local authority or individual contributions within the State.

"No portion of said moneys shall be applied, directly or indirectly, to the purchase, erection, preservation, or repair of any building or buildings, or the purchase or rental of land, or in college-course teaching, lectures in colleges, promoting agricultural trains, or any other purpose not specified in this act, and not more than five per centum of each annual appropriation shall be applied to the printing and distribution of publications."

From 1917 considerable additional amounts of Federal funds were annually appropriated for the coöperative extension work. The Capper-Ketcham Act of May 22, 1928, provided for the further development of this work by authorizing the annual appropriation of \$980,000, of which \$20,000 goes to each State and the Territory of Hawaii, beginning with the fiscal year 1929, and for each year thereafter the additional lump sum of \$500,000. At least 80 per cent of the sums appropriated under this act must be spent for the salaries of county extension agents, who "shall be men and women in fair and just proportions," and these funds may be used for the promotion of agricultural trains.

Soon after the passage of the Smith-Lever Act, the Department and the colleges generally entered into a formal agreement, through a "memorandum of understanding," under which the Department agreed to conduct all its extension work through the college, provided the college created an extension division and put at its head a director who would be the joint representative of the college and the Department and have charge of all the coöperative agricultural extension in the State. For the Department's business necessitated by this act, a committee was at first organized, but on July 1, 1915, when the States Relations Service was created, general supervision was given to the director of that service, under whom were put two extension offices transferred from the Bureau of Plant Industry, one for 15 Southern States and the other for the 33 Northern and Western States. In 1920 the two offices were combined and in 1923, when the States Relations Service was abolished, the Coöperative Extension Office became a part of the new Extension Service, which contains also the Office of Exhibits and the Motion Picture Laboratory.

The Extension Office administers the Federal funds for extension work in the States and for the maintenance of the Washington Office. Representatives of the different bureaus of the Department also do extension work in the States, under the supervision of the Extension Service.

In the States, the college organization consists of the extension director, leaders of county agricultural, home economics, and club agents, and extension specialists in the various branches of agriculture and home economics, together with the men and women agents located in the counties. This nation-wide system of practical education for the farming people had hardly become well organized when the War brought to it unusual responsibilities. To aid in stimulating agricultural production and food conservation, the States Relations Service was given funds to supplement the regular extension funds. In war-time, the extension organization was pushed forward very rapidly until more than 2400 counties had agricultural agents and about 1700 counties and 200 cities had home demonstration agents. About 2,000,000 boys and girls were enrolled in clubs. At one time, about 7000 persons were included in the coöperative extension forces, which accomplished a great work in aiding the farmers to produce an adequate food supply and our people generally to conserve this supply. To accomplish this task, it was necessary to organize the farming people more thoroughly. The extension forces, therefore, were very active in promoting the older organizations and forming new ones. In the Northern and Western States, special advantage was taken of an organization called the farm bureau. This movement began in New York in 1911 and soon spread to other States. In war time, the extension agents organized farm bureaus in many counties.

After the War, when economic conditions aroused the farmers to the importance of coöperative marketing and legislation relating to agriculture, the farm bureaus expanded their work beyond the educational field and formed State federations and a national federation called the American Farm Bureau Federation. It was then necessary to readjust the relations of the extension forces to the farm bureaus and to confine these forces to educational work broadly defined. When the war emergency funds were withdrawn in 1919, the number of extension workers materially decreased. The farming people, however, retained their interest in extension work and before long the number of county extension workers again increased. Since the War, much of the extension work has related to agricultural economics, particularly coöperative marketing.

In 1928, out of 3044 counties reporting agricultural products, 2256 had men county extension agents; 1041 had women agents. The men included 94 directors and State leaders, 113 assistant State leaders, 2318 white county agents and assistants and 184 colored local agents. The women agents were 44 State leaders, 83 assistant State leaders, 941 white county agents and 115 colored local agents. The men and women agents did much work with children, but there were also special agents for boys' and girls' clubs, as follows: 42 State leaders, 74 assistant State leaders, 145 county leaders. In addition, there were about 1000 extension specialists and several hundred clerical assistants, making a total extension force of 5160. About 620,000 boys and girls were enrolled in 44,188 clubs. For

the fiscal year beginning July 1, 1928, about \$575,000 was appropriated for the Extension Service in the U. S. Department of Agriculture and \$22,492,800 was used in the States and Hawaii. Of this amount, \$8,564,050 was Federal funds, including \$1,346,500 derived from direct appropriations to the Department of Agriculture, \$54,600 for forestry extension work, \$6,182,935 under the terms of the Smith-Lever Act, and \$980,000 under the Capper-Ketcham Act. From sources within the States, \$13,928,600 was contributed, of which \$8,045,700 was State and college funds; \$4,797,500, county funds; and \$1,095,400, from farm organizations and other sources. In Alaska, Guam, and the Virgin Islands, extension work was conducted by the Federal experiment stations, and in Porto Rico, by the insular bureau of agriculture.

**Other Countries.** Many countries had more or less elaborate systems of agricultural extension work, usually under the general supervision of departments of agriculture and often connected with agricultural colleges and schools. In England and Wales, extension work was conducted through county agricultural councils, with approval of the Ministry of Agriculture, and aided the government funds by the Development Commission. The work was done by agricultural organizers, itinerant lecturers, and specialists from agricultural colleges and the Ministry. A similar organization existed in Ireland. In Scotland, the work was done through the universities. In Canada, a large number of extension agents were employed under the supervision of the provincial department of agriculture. Similar work was done in Australia, New Zealand, and the Union of South Africa. In France, under the Ministry of Agriculture were inspectors-general, directors of agricultural services and their staffs in the several departments (counties), and extension specialists. A similar system existed in Belgium. The Belgian Peasants' League, with over 190,000 men, women, and children as members, also carried on much work. In Denmark, the Department of Agriculture, Royal Agricultural Society, and local agricultural associations joined in the work. In Italy, there were over 300 itinerant teachers of agriculture. The Government and the agricultural societies conducted the work in Norway, Sweden, Holland, Finland, and Germany. There was organized work in Spain, Switzerland, Bulgaria, India, Burma, British West Indies, Chile, Argentina, and other South American countries.

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**AGRICULTURE.** The period of the World War and the years following brought great changes in agriculture. It marked great stimulation of production and emphasis on the importance of agriculture to the countries at war, followed by the most serious and long-continued depression that industry has ever experienced. This period was also the time of unusual developments in the interest of more productive and better stabilized agriculture. In the United States, numerous laws were passed by Congress

providing for increased attention to research and extension work, agricultural credit, coöperation, standardization of products, warehousing, market and price studies, news service, and measures for aiding and safeguarding marketing and distribution. The economic aspects of the industry became a subject of extensive study. Official standards were promulgated for leading products, regulatory measures enacted to preserve competition and prevent unfair manipulation of prices, the essentials of successful coöperation in marketing and distribution and in buying farm supplies were studied, and organization of farming people to promote their welfare was given unprecedented impetus. The new conditions marked an epoch in the industry.

**Agriculture during the World War.** The outbreak of the War found agriculture in a highly developed condition in most of the countries. For years special attention had been given to the promotion of food production as a source of strength and a safeguard. France was noted for the large number of its small farms and its thrifty agricultural class, more than half of whom were landowners.

Germany had long pursued a policy of encouraging the industry, leading the world in its agricultural investigation, instruction, and favorable consideration for the industry. The growing of food was looked upon as a measure for the common good and was a part of its campaign for supremacy. It was producing about 82 per cent of its requirements in edible grains (including flour), 93 per cent of its meats, 92 per cent of its dairy products, 67 per cent of its poultry, and 99 per cent of its vegetables—about 88 per cent of the total food requirements of that country. France was producing about 93 per cent of the required edible grains, 98 per cent of meats, 80 per cent of poultry, and slightly more than it consumed of dairy products, vegetables, and fruits. Austria-Hungary was almost entirely self-sustaining in food supplies, while Russia was a surplus producer of food stuffs, exporting about 19 per cent of its production of edible grains.

Great Britain, on the other hand, had allowed its agriculture to languish and had developed the policy of purchasing its food in large measure abroad. It grew only 27 per cent of the required food grains, 53 per cent of the meats, 62 per cent of the dairy products, and 58 per cent of the poultry consumed—in other words, only about half of the food required. Prior to the outbreak of the War, two-thirds of the total farm area was in permanent grass and only one-third in cultivated crops; whereas, in Germany, the proportion was exactly the reverse. It was said that British agriculture fed with home-grown food a third more people and employed a third more labor in 1870 than it did in 1913, because in the meantime the country had so largely turned from cultivated crops to grass farming. The War soon served to demonstrate the inadequate state of British agriculture.

At the outset, all of the European countries took steps to conserve their food supplies, to increase production of the most necessary staples, and to adapt the production to the military needs and requirements of the people. The feeding of bread grains to live stock was largely restricted or prohibited. The amount of grain used for brewing and distilling was cut down, and closer milling of cereals was required, the addition of substitutes being first permitted



and later enjoined. Nonessential crops such as tobacco were prohibited and bulb growing and hop growing were much reduced. With the development of the airplane, flax growing became a war necessity and in Great Britain particularly it was stimulated and placed under strict regulation.

In Germany, the whole question of production was systematized and brought under government regulation; and, in France, organization was carried to a high degree. Laws in the latter country permitted neglected land to be taken over by the commune. The Government subsidized the purchase of expensive labor-saving machinery by co-operative societies or communes and bounties were offered and prices guaranteed for essential products. In most of the warring countries, labor soon became scarce, owing to the extension of the draft, and women began to take the places of men in farm work. The seriousness of Great Britain's position was intensified when the submarines became active. That country declined, however, to guarantee the price of wheat, but made patriotic appeals to farmers and landowners to plow up their grass land and pastures and increase the acreage under wheat. This met with much objection in the absence of a well-defined permanent policy toward agriculture. Later, such a change in farming was enjoined and acts passed enabling the taking over of such land and placing a penalty on neglect of owners to practice good farming.

The wheat crop of 1914 represented a world shortage of approximately 386,000,000 bushels, that of Europe alone amounting to 323,000,000 bushels; but, in the following year, the crop was much the largest ever produced. Great Britain shared in this; notwithstanding this, three-fourths of its wheat supply had to be imported. In that year (1915), the United Kingdom imported agricultural products valued at \$1,342,000,000, while France bought food products costing \$492,000,000. The United States produced the greatest wheat crop in 1915 ever raised, passing the billion-bushel mark for the first time and representing about one-fourth of the entire world's production. This was in response to the appeal from Europe and to increasing prices. The export of wheat from the United States to Europe jumped to two and three times the pre-war amount.

In 1916 the crops of wheat, barley, oats, and maize in the Northern Hemisphere were decidedly less than in 1915, causing prices to rise and anxiety to increase. With the continuance of the War, the preëminent position of agriculture in the welfare of the countries involved became unmistakable, and its importance was conceded as second only to that of the military activities. With thousands of acres devastated, relations with other countries interrupted, and a vast number of farmers and farm laborers drafted into the army, not only unusual demands but unusual conditions had to be met.

To overcome its disadvantage, Great Britain made most urgent appeals and adopted numerous measures to readjust the systems of farming. War committees and borough war societies sought to assist the farmers in the matter of information, labor, seed, fertilizers, etc., and attention was turned to the cultivation of land not ordinarily employed in agriculture, such as parks and pleasure grounds, the use of woodland for raising pigs, etc. Farmers were urged to shorten the period of grass and clover in ro-

tations and to reduce the acreage of bare fallow.

There was widespread effort to prevent the depletion of live stock in the warring countries, especially the work animals, milch cows, and breeding stock. Scarcity of gasoline (petrol) for tractors and other machines, high prices of fertilizers and the scarcity and cost of seeds were other handicaps. Forage was unusually high and was requisitioned in large amounts by the armies. Farmers felt that the well-nigh impossible was being urged upon them. Prisoners of war, to whom there was at first objection, were successfully used in France and England and generally found to be submissive. In 1917 Great Britain enacted a comprehensive measure known as the Corn Production Act, guaranteeing prices of wheat for a period of six years, establishing prices for oats and barley, and fixing a minimum wage for agricultural labor. A live agricultural policy was put into effect in that country under the Defense of the Realm Act, enabling the taking over of waste lands and commons and compelling the breaking up of grass land and the use of the cultivated land in accordance with the needs of the country. It was estimated that in 1917 an additional million acres were put under the plow in that country.

When the United States entered the World War in 1917, renewed efforts were given to increasing production of the essentials, for home use and for the Allies. The Selective Service Law made agriculture one of the industries for which exemption could be claimed. The United States Food Administration fixed the price of the 1917 wheat crop at \$2.20 per bushel for Number 1 hard, and the Federal Grain Corporation was formed which took over the purchase of wheat for export and for the larger flour mills. The price had risen to \$3.18 and the fixing of a price which was represented as little above the actual cost of production under war conditions raised considerable opposition, but was accepted as a patriotic measure. While the wheat crop of 1917 was light, the aggregate of all cereals in the United States was approximately a billion bushels above the average of the previous five years. In most of the Allied countries, the production of cereals fell off materially, showing that Europe was fast declining in food-producing power. Restrictions on the use of any material suitable for human food became more stringent. Horses were placed on rations and even the feeding of game and migratory birds was prohibited. Shortage of tonnage and increased risk practically eliminated from the market such surplus grain-producing countries as India, Australia, and Argentina. This laid the heavier burden on the United States and Canada. The latter country had made a remarkable showing, and in 1918 responded with the largest areas on record in that country for all food crops except corn. In the United States, a carefully considered agricultural programme was laid out for 1918, the first of its kind in America, in which special emphasis was laid upon the wheat crop, with the aim of a billion bushels. The necessary acreage was apportioned among the States and the duty of meeting the apportionment and assisting the farmers was assigned to the County extension agents, State Councils of Defense, and other agencies. The President in a message to the farmers called upon them for a supreme effort, and Congress appropriated \$2,500,000 to be used as a revolving fund in supplying farmers with suitable seed in cer-

tain sections of shortage, the fund being administered by the Department of Agriculture.

The season of 1918 was adverse over considerable sections of the United States, but the production amounted to 921,438,000 bushels, the largest ever raised except in the record year of 1915, exceeding the preceding five-year average by nearly 107,000,000 bushels. Equally striking were the results in producing large supplies of other crops, meat, and dairy products. The labor situation became even more acute, with the extension of the draft and the large opportunities offered by other industries. Organized effort was made to meet the shortage. A Boys' Working Reserve was organized, students were recruited to work on the farms during their vacation, colleges lengthened the summer vacation, and the Women's Land Army went into training. Business men, clerks, and factory operatives worked on the farms after regular hours and in their vacations to gather in the world's bread crops without loss. On the whole, the results furnished a new evidence of the remarkable resourcefulness of American agriculture.

Under stress of the emergency, Great Britain redoubled its efforts and added another 2,000,000 acres to its tilled area, the increase in wheat being 752,000 acres. The labor situation became increasingly acute, and unusual and part-time labor had to be resorted to. More than 300,000 whole-time and part-time women workers were reported to be engaged on the land in the United Kingdom. The acreage in wheat, barley, and oats in 1918 was the highest ever recorded in British agriculture, and that in potatoes the largest since 1872. It was estimated that the production would provide forty weeks' supply of bread stuffs for the entire population of the United Kingdom at the prevailing scale of milling and consumption, a remarkable achievement for a country which only a few years before had imported its food stuffs in such large measure.

France likewise made strenuous efforts to extend its food production in 1918, but by reason of its reduced man power had about reached its maximum. While the wheat crop was larger and of better quality than in the preceding year, production had dwindled with the continuance of the War and even with the 1918 increase was much below the normal for that country. The potato situation was particularly grave, the crop being not over two-thirds of the ten-year average.

A systematic campaign like that of the previous year was prosecuted in the United States in the fall of 1918, with the objective of a great liberty wheat harvest for 1919. The response was an acreage more than 15,000,000 greater than any previously recorded. Although the season was not favorable for the spring-sown crop, wheat production amounted to 967,979,000 bushels, considerably in excess of the 1918 crop and the second largest in history. The total area sown to leading cereals in the crop year of 1919 was 33,000,000 acres greater than the pre-war average for 1910-14, and produced 635,000,000 bushels more than that average. The 1919 crops in the European countries, as estimated by the International Institute of Agriculture, were not over 70 per cent of their food requirements. There was a decided decrease in the area devoted to cereals and potatoes in Great Britain, with a consequent decrease in production. There were corresponding decreases in livestock, with a disquieting prospect for milk and a falling off of

young stock and sheep. The post-war period, therefore, found Europe largely dependent on imported food.

**Agriculture Following the War.** *In the United States.*—After the close of the War, the Department of Agriculture, realizing the dangers of over production as a result of the opening up of the channels of trade and the resumption of farming in Europe, recommended a reduction in the wheat area of about 15 per cent and advised safe farming. The season was unfavorable, the labor shortage continued, amounting to approximately 37 per cent, and wages rose to an appalling point. This, with the continued high cost of fertilizers, machinery, and supplies, all of which had greatly increased since 1914, made the hazard unusually large. Altogether, the American farmers had to meet the most difficult situation in 1920 they had ever experienced. The harvest, one of the largest of record, met a falling market in the late summer and autumn, with the worst slump in the history of grain prices. This threw the farmers and the banks supporting them into panic and resulted in the most severe agricultural depression the country had ever known. While Europe was still in need of outside food, difficulties of transportation, unfavorable exchange, and inability of the countries to buy worked against export. Moreover, Canada and British India, two prominent exporting countries, had a combined wheat crop 195,000,000 bushels greater than in 1919.

While agriculture shared in the general business depression in America, no other industry was affected so soon or so seriously. Farmers had not been allowed to profit by the war emergency as other industries had. Prices had been held down by the Food Administration and by agreement. Crops were produced at maximum costs on land inflated in price and often heavily mortgaged. The large wheat crop of 1920 was worth \$3,000,000,000 less than the smaller crop of 1919. Live stock and its products likewise declined to an extent causing serious loss to producers. The total value of animal products in 1920 was about \$200,000,000 less than in 1919.

Congress, called upon for relief, revived the War Finance Corporation to aid local banks in carrying farmers and marketing crops and passed an emergency tariff favorable to agriculture. Price conditions continued in 1921, with production far in excess of domestic needs, high freight rates, inability of Europe to buy, and general business depression. Wheat fell below \$1 a bushel, with its purchasing power less than the low price of 49 cents in 1894. Corn on the farms of the Corn Belt was lower than for 25 years. It was estimated that one-fourth of the farmers of the country were facing bankruptcy or had been wiped out. Similarly, land rents, which had doubled, trebled, and increased ever more in the prosperous years of the War, caused many renters to lose not only their labor but their savings. The purchasing power of the principal farm crops became lower than ever before, and that of the major grain crops was little more than half the average for the five pre-war years. The farmers' labor returns were reduced to about the pre-war level, while the wages of workers in other lines remained near the war level. The cost of getting farm products to market frequently exceeded the amount the farmer himself received in return. The situation attracted such attention that Congress appointed the Joint Congressional Commission of

Agricultural Inquiry, which in the winter of 1921-22 made a series of illuminating reports and urged the necessity for the formulation of a definite programme looking to the permanent development of agriculture, with a view to relating it to the various agencies of distribution in such a way as to avoid duplication, waste, and loss in reaching the consumer.

The severe agricultural depression continued in 1922 with little abatement, while the cumulative effect noticeably increased and there was great discouragement on the part of the farming people. In most farming States, taxes on farms had more than doubled since before the War. In the Central Western States, these absorbed one-third of the farm income, as compared with less than one-tenth in 1913. Early in the year, President Harding called a National Agricultural Conference at Washington, the first of the kind ever held in the United States, with representatives from the principal farm organizations, agricultural institutions, and various lines of industry directly related to agriculture. This gave opportunity for a broadminded consideration of the situation and the outlining of remedial measures. The recommendations and the measures urged were notable for their sound constructive character. Favorable action was taken on many of them. The revival of the War Finance Corporation, making available more than \$350,000,000 for agricultural financing, saved thousands of farmers from bankruptcy and many banks in the agricultural regions from passing into the hands of receivers, besides restoring confidence and having a salient effect upon interest rates. The provision for greatly increased mortgage loans by the farm-land banks and joint stock land banks enabled farmers in large numbers to refund their obligations and place them on a deferred payment basis. Unusual attention was given to aiding the marketing of farm products. A tariff law more favorable to agriculture was enacted; the Packers and Stockyards Act placed all packing houses, stockyards, and similar agencies under government supervision, giving assurance of open competitive conditions; and an act was passed extending government supervision over grain exchanges dealing in futures, in the effort to control another practice believed to be disadvantageous to agriculture. During this period the Farm Bloc in Congress became active and a source of great power, overriding party lines and giving the farmers' interest unprecedented backing.

Although there were some marks of improvement in 1923 over the three previous years, the wheat situation became even worse, and it was only by comparison that the situation as a whole appeared better. The 1923 wheat crop, nearly three-fourths as large as that of 1919, had a value of only \$736,000,000, compared with \$2,080,000,000 in 1919. The aggregate value of crops and live-stock products, however, was estimated at \$12,204,000,000, nearly a billion more than in 1922. The index of the purchasing power of farm-crops as a group was 75 as compared with 64 in 1922. Many farmers, however, had been reduced to the breaking point by the low price of wheat and the shrinkage in value of range cattle. Thousands went bankrupt and many more were impoverished. Statistics of fifteen wheat- and corn-producing States showed that 9.5 per cent of the farmers had lost their

farms, while an additional 15 per cent were saved only by the leniency of their creditors.

These continued four years of distress resulted in increasing unrest and dissatisfaction over the whole country and a drift to the towns and cities. Of the many remedies suggested and pressed with vigor, a common one was the guarantee of prices for wheat, which did not find favor. The President raised the tariff on wheat 12 cents a bushel, bringing it up to 42 cents, to meet the competition of Canada. It was made clear, however, that the United States could not successfully compete with Canada in wheat selling in European markets, owing to cheaper production and more advantageous shipping facilities. This, in connection with the competition of other countries, the unfavorable exchange, and diminished ability of Europe to buy, emphasized the need of readjustment. The exports of wheat fell off from upwards of 265,000,000 bushels in 1921 and 205,000,000 bushels in 1922 to a little less than 132,000,000 bushels in 1923. There was also a considerable decline in exports of flour. The number of farm bankruptcies increased from 1.4 a year per 10,000 farms in 1904-13 to 12.2 per year in 1925-27.

This depression continued, in gradually lessened degree, the season of 1928 marking an advance in some lines, notably in the live-stock industry. Agriculture has not shared in the general business prosperity. There is conviction that it is laboring under disadvantages which it should be possible to remove. Its returns are not stabilized and the recurrence of surpluses, despite attempts at readjustment, have reduced the margin of profit to a point where returns for labor and investment are disproportionately small. Special commissions, conferences, and inquiries by various organizations have been unable to supply a remedy. These have made it apparent that there is no single remedy but that a combination of more favorable conditions and provisions must be looked to. Among these are mentioned greater diversification and a better balanced production of leading crops, adjustment between production and consumption, orderly marketing, more adequate tariff for home-grown products, a sound land policy, cheaper transportation, more equitable taxation of farm property, and especially the provision of a Federal farm board or commission to work out effective economic remedies. Such a board, it is expected, would study the whole situation broadly as to conditions and remedies, further develop sound coöperative marketing, with adequate warehousing facilities and provisions to eliminate waste in distribution; and would promote farmer-owned and controlled stabilization corporations, with initial advances from the Federal Treasury. The subject of "farm relief" was one of the outstanding features of the presidential campaign in 1928, to which both parties were committed, and confidence was felt that with clarification of the factors in the situation every effort would be made further to stabilize the industry and restore its prosperity. Following his inauguration, President Hoover called a special session of Congress in April, 1929, to deal with this matter and the tariff. See UNITED STATES.

Despite the depression, agricultural production held up well. The acreage of crops harvested in 1928 was the largest on record and a good showing was made by most of the staple crops. Wheat production was the largest since 1919, amounting to over 900,000,000 bushels. The

acreage of corn, by far the largest in any single crop, nearly equaled the combined area in the principal cereal crops, and production was unusually large. The oat crop was considerably above the average, while barley and potatoes were record crops and cotton, with the exception of 1925 and 1926, rarely had been exceeded.

**In Other Countries.** While there was great revival of agricultural production in the countries of Europe, farming was in an abnormal condition in several localities and suffered depression. The wheat growers of Australia had had their market cut off by shortage of tonnage and wheat was accumulating in large quantities. The Government afforded relief by guaranteeing \$1 a bushel, later prepared for bulk storage and shipment, and administered the elevator system. Arrangements were made to finance the wheat pool, the Government advancing farmers three shillings per bushel f.o.b. Aid was also extended to the pastoral industry by a subsidy of ¼d. a pound on beef. The Argentine live-stock industry was reported in the most serious condition in its history, due to the slump in foreign demand, depreciation in the value of grazing lands, and threatened loss of herds through insufficient pasturage. South Africa, faced with a large cattle surplus and very low prices, had a government-provided bounty equivalent to one cent per pound on exported beef and one-half cent on live stock.

The cultivated area in Great Britain began to decline almost immediately after the War. Taxes had become high, wages advanced, and demands of tenants increased. Many large estates were broken up and sold. The recommendations of the Royal Commission, appointed under the Ministry of Reconstruction, for a more liberal policy toward agriculture were not enacted into law and the essential features of a compromise passed in 1920, continuing a portion of the Corn Production Act and otherwise providing for greater security in arable farming, were repealed the following year, causing great disappointment and sharp criticism. In 1920 the acreage under wheat in England and Wales was only 70,000 acres more than in 1914, with an equal falling off in oats. In ten years, the urban population had increased about 2,000,000, while rural districts declined about 50,000. The last payments under the guaranteed minimum grain prices, originated in 1917, were made in 1922. The maintenance of this guarantee during six years cost the country approximately £14,000,000. The plight of British farmers in 1923 was well-nigh desperate. In that year, 400,000 acres of plowed land were laid down in grass. The war-time increase in cultivated acreage disappeared, the land being laid down in grass, and wages of agricultural labor became so low as to afford only the scantiest livelihood. Despite this, the net returns on large estates was only about 1 to 2 per cent. There was strong opposition to protective tariff, because of the large amount of unemployment in the industries and the demand for cheap food. An Agricultural Tribunal made a further report with recommendations and, finally, near the close of the year, an agricultural subsidy of £1 an acre was provided on arable land, including market gardens, fruit, and hops, contingent on the farmers' paying labor a wage of not less than 30 shillings a week. The depression continued without material abatement, and in 1928 was declared by authorities to be fully as bad as in late eighties and early nineties.

France recovered quite rapidly after the War.

In less than two years after the Armistice nearly 50 per cent of the devastated land had been cleared and put under cultivation, and in a short time practically the entire area had been restored. Early assistance given farmers in that area was extended to those who wished to acquire farm land to replace that too seriously damaged for occupancy. By 1923 reconstruction had reached a point where wheat production was about 90 per cent of the pre-war figure. French millers were still required to mill closely and to incorporate from 8 to 10 per cent of substitutes in flour. As in several other European countries, rural depopulation became something of a problem. Many farmers and laborers were attracted to the towns by higher wages. Agriculture passed through a quite drastic readjustment, shifting more largely to animal husbandry.

Devastated lands in the Belgian war zone were taken over by the Government, restored and turned back to the original owners in good condition, with payment of 5 per cent interest on pre-war value while in government hands.

Italy continued for several years to fix the price for wheat and paid premiums for grain produced in the southern provinces or wheat produced in excess of that raised in 1918, the effort being to minimize importation. Later, Mussolini undertook measures for the promotion of agriculture and announced the public policy of giving first place to that industry.

Production in Germany recovered quite rapidly, but agricultural labor became a problem and live stock numbers were short. Farmers were slow to accept the Government Food Commission price for grain, and there was conflict of interest between city and rural population. Consequently, food shortage continued into 1924. The three main aspects in connection with this were (1) the breakdown in currency, causing a collapse of distribution, (2) inability of merchants to finance the full annual margin of imports necessary to make up the usual deficit in domestic production, and (3) widespread unemployment, as a result of which millions of workers in urban and manufacturing districts were unable to purchase sufficient food, even if it were in the market. Later, agriculture was restored to its former position and efforts were put forth to stimulate live-stock production.

Russian agriculture recovered slowly, owing to the disorganized condition of the country and the indefinite land policy which contributed to distrust and uncertainty. Crop production in lines in which the country was formerly a leader and a large exporter decreased tremendously, while in many sections famine conditions prevailed. By 1923, the grain area was reported at about 80 per cent of the pre-war figures for the present Russian territory, but only small quantities were available for export. Besides the local confiscation of the land in Soviet Russia, there were various measures for breaking up large estates in Germany, Austria, Hungary, Poland, Rumania, and Czechoslovakia.

By 1926 it was reported that agricultural production in Europe, outside of Russia, had practically recovered. Cereals and potatoes were fully up to the pre-war average and the principal crops in all European countries (except Russia) was only about 5 per cent below that immediately preceding the War.

The production of corn (maize), barley, oats, rye, wheat, and cotton by leading countries in 1927 and 1928 is shown in the accompanying table.

## Production by Countries in 1927 and 1928 of Wheat, Rye, Oats, Barley and Maize in Bushels and of Cotton in Bales

	WHEAT			RYE			OATS			BARLEY			MAIZE			COTTON		
	1928	1927	1928	1928	1927	1928	1928	1927	1928	1927	1928	1927	1928	1927	1928	1928	1927	1927
United States	902,749,000	878,374,000	41,766,000	58,164,000	1,449,531,000	1,122,594,000	856,868,000	265,882,000	2,839,959,000	2,763,093,000	14,373,000	12,783,000						
Canada	500,613,000	440,025,000	14,626,000	14,951,000	454,849,000	1,467,195,000	134,452,000	96,938,000	4,692,000	4,262,000								
Argentina *	239,161,000	220,826,000	6,614,000		52,291,000	66,000,000	14,560,000	18,000,000	306,000,000	321,000,000								
Chile	23,285,000			57,000	7,000,000	4,000,000	7,000,000	5,000,000		1,400,000								
Uruguay	15,397,000	10,234,000			3,293,000	1,400,000	116,000		5,000,000	3,000,000								
Austria	12,055,000	11,960,000	19,145,000	20,126,000	29,652,000	30,231,000	11,731,000	10,934,000	8,692,000	4,948,000								
Hungary	92,037,000	76,933,000	32,528,000	22,365,000	23,725,000	22,513,000	27,872,000	23,685,000	43,325,000	68,348,000								
Czechoslovakia	41,434,000	40,384,000	52,677,000	49,237,000	90,406,000	100,423,000	59,602,000	59,014,000	7,986,000	11,755,000								
Belgium	17,778,000	16,276,000	27,676,000	21,854,000	48,343,000	46,102,000	4,694,000	4,169,000										
Bulgaria	50,691,000	47,346,000	9,220,000	8,243,000	7,210,000	7,481,000	15,744,000	14,041,000	18,293,000	20,614,000								
Denmark	9,408,000			10,365,000		60,863,000		36,063,000										
Estonia	1,103,000	1,079,000	5,794,000	6,735,000	7,639,000	6,727,000	4,200,000	4,335,000										
Finland	879,000	1,064,000	10,940,000	12,392,000	35,115,000	43,609,000	5,889,000	6,571,000										
France	277,855,000	276,126,000	85,362,000	83,956,000	836,257,000	943,282,000	53,104,000	50,323,000	20,721,000									
Germany	126,462,000	120,521,000	303,285,000	269,030,000	426,039,000	437,251,000	134,786,000	125,754,000										
Greece	15,676,000	12,970,000	2,124,000	1,505,000	8,765,000	4,050,000	10,859,000	7,294,000										
Italy	228,596,000	195,808,000	6,535,000	5,937,000	48,413,000	30,720,000	11,024,000	9,443,000	83,938,000									
Jugo-Slavia	105,361,000	56,568,000	8,563,000	5,923,000	26,713,000	20,114,000	20,230,000	14,449,000	83,009,000									
Latvia	2,607,000	2,636,000	9,026,000	10,189,000		12,205,000		5,975,000										
Lithuania	7,275,000	5,273,000	19,035,000	21,188,000	19,704,000	16,741,000	7,363,000	8,630,000										
Luxembourg	799,000	701,000	354,000	354,000	3,131,000	2,763,000	198,000	178,000										
Netherlands	7,569,000	6,156,000	17,047,000	13,489,000	25,353,000	21,144,000	4,547,000	3,416,000										
Norway	676,000	605,000	612,000	606,000	11,608,000	12,665,000	5,600,000	4,672,000										
Poland	53,882,000	54,230,000	232,358,000	223,943,000	261,119,000	233,552,000	89,053,000	75,062,000	4,042,000									
Portugal	6,578,000	11,447,000	3,418,000	4,677,000	3,876,000	5,528,000	1,512,000	1,983,000										
Rumania	115,544,000	96,734,000	11,483,000	9,923,000	59,310,000	64,810,000	57,952,000		99,874,000	139,095,000								
U. S. S. R.	859,789,000	745,885,000	783,433,000	933,033,000	1,109,197,000	888,735,000	261,804,000	211,281,000	148,813,000	983,000								
Spain	129,591,000	144,824,000	24,407,000	26,615,000	37,558,000	39,217,000	82,538,000	92,223,000	23,877,000	26,105,000								
Sweden						79,000,000		12,000,000										
Switzerland	5,968,000	5,696,000	1,705,000	1,589,000	2,880,000	2,880,000	565,000	561,000	157,000									
United Kingdom					203,000,000			44,000,000										
British India	289,781,000	834,992,000						119,000,000	77,000,000	5,500,000								
Japan	31,186,000	29,221,000			12,000,000	83,505,000	82,485,000											
Algeria	83,987,000	28,323,000			10,907,000	38,122,000	34,455,000		203,000									
Egypt	87,296,000	44,346,000			13,779,000	10,799,000	11,961,000											
Tunisia	12,195,000	8,267,000			2,239,000	1,963,000	12,631,000	4,134,000										
Australia	116,737,000	160,852,000																
New Zealand					5,000,000	6,000,000	1,000,000	1,000,000										
Union of South Africa	7,275,000	6,644,000			7,036,000	6,080,000	916,000	816,000	19,000,000	65,000,000								

\* The production given countries of the Southern Hemisphere is for the crop years 1927-28 and 1928-29.



**Census of Agriculture.** The agricultural census of 1925 showed a total farm area in the United States of 924,319,352 acres, as compared with 955,883,715 acres in 1920 and 878,798,325 acres in 1910. In the 5 years, 1919-24, the total area in harvested crops decreased 13,000,000 acres, the first decrease ever shown. The agricultural census of 1925 showed the total number of farms to be 6,371,040, as compared with 6,448,343 in 1920. The aggregate value of all farm property in 1920 was reported as \$77,923,651,599, and in 1925 as \$57,017,740,040. This decline was mainly in land values, which had dropped from \$54,829,563,059 in 1920 to \$37,721,018,222 five years later. In 1910 farm property was valued at an aggregate of \$10,991,449,090, and land alone at \$28,475,674,169. The increase in land values was nearly 100 per cent from 1910 to 1920, and the shrinkage in the five years following was nearly a third. A survey by the Department of Agriculture in March, 1928, showed that farm real estate values were only 17 per cent above the pre-war level, compared with 57 per cent in 1921.

For the first time in the country's history, the urban population exceeded that in rural territory in 1920, and the growth of the former had been at a considerably more rapid rate. This decline in rural population has since continued. In the eight years, 1920-28, there was an estimated net loss of 3,283,000 persons on farms, or an average of 400,000 a year. The Department of Agriculture estimated that less than 24 per cent of the population was actually living on farms, and that one farm family was producing raw materials for food and clothing for three families living in towns and cities. This is a striking evidence of the efficiency developed in agricultural production.

**Position of the United States in World Agriculture.** Of the four countries which have stood preëminent in agricultural production, i.e., the United States, Russia, China, and India, the United States was the only one producing a surplus for export. It is the largest producer of corn, it is much the largest wheat-producing country of the world, and since the decline in Russia, it leads in the other cereals except rye and rice. No other country approaches it in cotton or tobacco. Nearly 70 per cent of the world's crop of corn, 60 per cent of the cotton, 50 per cent of the tobacco, and approximately one-fourth of the total cereal supply is raised in the United States. The large share of the world's staple crops contributed by the United States is grown with less than 4 per cent of the farmers and farm laborers of the world, which shows the high efficiency of the American farmer. The productivity of the American farm has increased steadily in the past few years, due to the increased use of machinery and mechanical power, and the efficiency of the farmer. There also has been a very marked upward trend in yield per acre in recent years. The United States also leads all nations in exports of agricultural products. Since the War, the value of its agricultural exports has exceeded the combined value of those from all other nations in the world, and yet these exports amount to only one-eighth of its production. Four countries now furnish about 90 per cent of the world's surplus of agricultural products, i.e., the United States, Canada, Argentina, and Australia, with the United States contributing approximately half. Its four great

surplus agricultural products are cotton, wheat, corn, and hogs.

**Farm Organization.** The farming people have made remarkable efforts to protect their economic interests, promote their welfare, and improve their general condition through organization. The American Farm Bureau Federation, formed by the federation of the State farm bureaus, based in turn on the County bureaus organized to promote extension work, has become one of the largest and most powerful national organizations, with a membership of approximately a million. The period of depression stimulated efforts toward organization especially for the purpose of coöperation in buying and selling products. The U. S. Department of Agriculture listed 11,400 active farmers' coöperative associations in 1928, compared with less than 6000 in 1915, with a trebled membership. These coöperatives in the 1927 marketing season did a business amounting to \$2,300,000,000; a fourfold increase since 1915, representing about one-fifth of the agricultural products of the country. Grain, milk, cream, butter, fruit, truck crops, nuts, cotton, tobacco, live stock, wool, poultry, and eggs were the most prominent products handled by marketing associations. The largest amount of business done by any one group in 1927 was by that handling grain, \$680,000,000; followed by dairy products amounting to \$620,000,000; live stock associations, \$320,000,000; and fruit and vegetable associations, \$300,000,000. Some 30 large-scale farmers' coöperative buying associations purchased supplies for their patrons in 1927 to the value of \$60,000,000. The essentials of success in coöperation are becoming more firmly established, on the basis of study and experience. The right of farmers to associate for purposes of marketing their products without violation of the Sherman Act, was specifically recognized by an act passed in 1922.

In Canada, a wheat pool has operated with increasing success for several years. This pool did a business of nearly \$324,000,000 in 1928, handling 215,489,563 bushels of wheat, and over 18,000,000 bushels of other grain. Its subsidiaries include in their membership more than half the farmers in the three prairie provinces, and handle over 60 per cent of the entire grain crop. Eleven terminal elevators of large capacity and nearly a thousand country elevators are being operated, with others under construction. The pool has become a controlling factor in the grain industry of the Dominion.

**Standardization of Farm Products.** Coöperative marketing, selling by contract, and warehousing have been greatly promoted through the establishment of Federal standards for agricultural products. Such standards, authorized by Congress, include cereals, cotton, hay, tobacco, live stock, wool, and many of the most important fruits and vegetables. The cotton standards have been adopted by the leading cotton exchanges of Europe for American cotton. The Warehouse Act, stabilizing the receipts for products stored in licensed warehouses, necessitated such standards, as did also the inauguration by the Department of Agriculture of shipping-point inspection of fruits and vegetables. Great benefit has been derived from this system of standards, and their use has done away with many of the controversies between shipper and buyer.

**Bibliography.** The following may be noted among the more important of the recent books

on agriculture and agricultural subjects: L. H. Bailey, *Cyclopædia of Farm Crops* (New York, 1922); *Cyclopædia of Farm Animals* (New York, 1922); H. J. Waters, *The Essentials of Agriculture* (Boston and London, 1915); A. H. H. Matthews, *Fifty Years of Agricultural Politics, 1865-1915* (London, 1915); Linlithgow et al, *Report of the Royal Commission on Agriculture in India* (London, 1928); E. Davenport, *The Farm* (New York, 1927); W. M. Jardine et al, *Yearbook of Agriculture, 1927*, Dept. of Agriculture (Washington, 1927); B. H. Hibbard, *Effects of the Great War upon Agriculture in the United States and Great Britain* (Washington, 1919); H. C. Taylor, *Agricultural Economics* (New York and London, 1919); J. M. Gillette, *Constructive Rural Sociology* (New York, 1916); J. E. Boyle, *Agricultural Economics* (Philadelphia and London, 1921); C. S. Duncan, *Marketing, Its Problems and Methods* (New York and London, 1920); O. B. Jeanness, *The Cooperative Marketing of Farm Products* (Philadelphia and London, 1923); Helen Douglas Irvine, *The Making of Rural Europe* (London, 1923); N. S. B. Gras, *A History of Agriculture in Europe and America* (New York, 1925); Lord Ernle, *English Farming, Past and Present* (London, 4th ed., 1927); M. E. Seeborn, *The Evolution of the English Farm* (London, 1927); B. A. Hibbard, *A History of the Public Land Policies* (New York, 1924); H. L. Shantz and C. F. Marbut, *The Vegetation and Soils of America* (New York, 1923); E. J. Russell, *Soil Conditions and Plant Growth* (London, 1927); L. A. Moorehouse, *The Management of the Farm* (New York, 1925); L. Carrier, *The Beginnings of Agriculture in America* (New York, 1923); J. Shaefer, *The History of Agriculture in Wisconsin* (State Historical Society, Madison, 1922); J. T. Stewart, *Engineering on the Farm* (Chicago, 1923); J. S. Chamberlain and C. A. Browne, *Chemistry in Agriculture* (New York, 1926); R. P. Teele, *The Economics of Land Reclamation in the United States* (Chicago, 1927).

**AGRICULTURE, INTERNATIONAL INSTITUTE OF.** The Institute, located at Rome, Italy, with 73 nations as adhering members, including the United States, has become a great agency for the collection of statistics relating to agriculture. The Institute continued its work with difficulty during the World War, but maintained its organization and has since made notable progress. David Lubin, its originator and for many years the United States representative, died early in 1919. English has been added to French as one of the official languages of the Institute. The condition and estimates for important crops and live stock from the various countries reporting are cabled promptly to the United States and the information is disseminated by the Department of Agriculture by radio and otherwise.

An important undertaking promoted by the Institute is the taking of a world agricultural census, in 1930. This has been arranged for in all the leading countries of the world, in many of which such a census had never been taken.

**AGRICULTURE, UNITED STATES DEPARTMENT OF.** This Department, established as a separate branch of the Government in 1862, has grown to be one of the large central agencies, working not only for the interests of the agricultural industry, but for the people living under it, and for the public welfare generally. The range of its service extends from food production and health to weather prediction, means of communi-

cation, and education. The chief functions of the Department may be classed as administration, service including information, regulation relating to the carrying out of various laws, and research. In recent years, the variety of its activities has been greatly enlarged and its work extended. It conducts research and inquiry in nearly every phase of crop and live-stock production and distribution, is carrying out a systematic soil survey, and is actively studying the broad economic problems in the field of agriculture. It is supervising the greatest road-building programme ever undertaken in history, by far the most extensive system for aiding farmers and their families directly through agricultural extension, and a nation-wide system of agricultural experiment stations. See articles on **AGRICULTURAL EXTENSION** and **AGRICULTURAL EXPERIMENT STATIONS**.

The Department of Agriculture also is administering the National Forests, comprising upward of 184,000,000 acres of land, and it is enforcing more than 30 regulatory laws for the health, safety, and general welfare of the public. Among the latter may be mentioned those relating to the inspection of food and drugs, the inspection of live stock and their products after slaughter for food consumption, import and export of animals, and control of interstate movement; laws regulating the importation of foreign birds and animals; interstate trade in game and protection of migratory and insectivorous birds; the inspection and quarantine of diseased or infested plants; road construction in cooperation with the States; cotton, grain, and other standards; trade in grain futures; Federal licensing of warehouses; and control of stockyards and packing-houses.

Edwin T. Meredith of Iowa succeeded David F. Houston as Secretary of Agriculture in February, 1920, and in turn was succeeded by Henry C. Wallace of Iowa on Mar. 4, 1921, who died in office Oct. 25, 1924. He was succeeded for a few months by H. W. Gore. William M. Jardine, of Kansas, became secretary in March, 1925, and Arthur M. Hyde in March, 1929. In addition to the Secretary, there is one assistant secretary, and directors of Scientific Work, Regulatory Work, and Extension. The organization includes the Weather Bureau, the Forest Service, the bureaus of Animal Industry, Plant Industry, Chemistry and Soils, Entomology, Dairy Industry, Biological Survey, Public Roads, Agricultural Economics, and Home Economics; the Office of Experiment Stations, Agricultural Extension Service, Plant Quarantine and Control Administration, Library, and several smaller units. The Bureau of Home Economics was established as a separate unit July 1, 1923, and the Bureau of Dairy Industry in 1924.

The personnel of the Department numbered more than 22,189 persons in 1928 of whom 5000 were in Washington. Its funds for the fiscal year ended June 30, 1929, aggregated \$155,059,968, including \$86,197,294 for road building. In 1928 the Department issued over 785 separate new publications, and 585 reprints. The total number of copies issued was 32,608,469, of which 11,367,959 were *Farmers' Bulletins*. Included in these publications were periodicals entitled *Journal of Agricultural Research*, *Monthly Weather Review*, *Experiment Station Record*, *Public Roads, Crops and Markets*, and *The Official Record*, a house organ; an *Annual Report of the Secretary*, and the *Yearbook*. In addition

to the above, a large number of articles were prepared for publication outside, in trade, scientific, and popular periodicals. The Department has an extensive and varied correspondence and maintains radio and press services for the dissemination of matter of immediate interest. The market news service employs nearly 8000 miles of leased wires covering all sections of the country. President Coolidge declared the Department "is doing more for the Agriculture of the Nation than any other government does or ever did."

**AHERN, MARY EILEEN** (?- ). An American librarian and editor, born near Indianapolis, Ind., and educated at the Central Normal College of Indiana and the Library School of the Armour Institute of Technology, Chicago. She was assistant state librarian of Indiana (1889-93) and state librarian (1893-95). She was organizer (1896) and secretary (1896-1907) of the library department of the National Education Association. In 1919 she was publicity agent of the American Library Association in France. Since 1896 she has been editor of *Public Libraries*. She is a contributor to library and educational journals and a lecturer.

**AHMED FUAD PASHA**. See **FUAD I**.

**AHMED MIRZA** (1898- ). A Shah of Persia (see **VOL. I**). He was crowned in 1914, and the regency abolished. He never exercised much power, and in 1923 he began living in France. In February, 1925, when the Medjliss conferred full power on Riza Khan, the Shah was asked to return, but refused, and on October 31 of that year he was deposed by the Medjliss. In November, he tried to reassert his claims, but with no success.

**AHMED ZOGU**. See **SKANDERBEG III**.

**AICARD, a'kär', JEAN FRANÇOIS VICTOR** (1848-1921). French poet and novelist (see **VOL. I**). After 1914 he published several volumes of war poetry and two novels, *Arlette des Mayons* (1917) and *Gaspard de Besse* (1919). The last-named work, in two volumes (*Gaspard de Besse, Raconté aux Poilus de France*, and *Gaspard de Besse, ses Dernières Aventures*) portrays a sort of Provençal Robin Hood, a man of the people who takes a truly Gallic pleasure in life and leads an existence which is care-free if hardly virtuous.

**AIKEN, CONRAD (POTTER)**. (1889- ). An American poet, born at Savannah, Ga., and educated at Harvard. After the appearance of his first volume, *Earth Triumphant and Other Tales* (1914), he became an important figure in the American poetical renaissance of the decade 1914-24. His work concerns itself with the consciousness of man rather than with the external world, and his manner is sometimes obscure, yet it is often rich in color, varied in incident, and musical in technique and content. Though the narrative poem in his favorite form, he has also written lyrics of a high order. He published a volume of critical essays, *Scepticisms—Notes on Contemporary Poetry* (1919). In 1923 he published *The Pilgrimage of Festus*, a narrative poem, which he called "a cerebral adventure." He published also: (poems) *Turns and Movies* (1916); *The Jig of Forslin* (1916); *Nocturne of Remembered Spring* (1917); *The Charnel Rose* (1918); *The House of Dust* (1920); *Punch; The Immortal Liar* (1921); *Priapus and the Pool* (1922); *Priapus and the Pool, and Other Poems* (1925); (stories) *Bring! Bring! and Other Stories* (1925); *Blue Voyage*, a novel, appeared in 1927, and *Costume by Eros*, a collection of 14

stories, in 1928. He edited *Modern American Poets* (an anthology, 1922), and *Selected Poems of Emily Dickinson* (1924). From 1917 to 1919, he was a contributing editor of *The Dial*, for which he wrote short stories similar in manner and phrasing to his poetry. In later years, he has made his home in England.

**AIKINS, SIR JAMES (ALBERT MANNING)** (1851-1929). Canadian lawyer and administrator, born in the County of Peel, Upper Canada. He was educated at Upper Canada College and the University of Toronto (1875), and was called to the bar of Ontario in 1878 and to that of Manitoba in 1879. He became a Queen's Counsel in 1884. He was a member of Parliament from Brandon, Canada, 1911-15. As director of the Imperial Bank of Canada and other financial companies, he took a prominent part in the financial affairs of the Dominion. He was president of the Canadian Bar Association, 1914-21; president of the Conference of Commissioners on Uniformity of Laws. In 1916-26 he was Lieutenant Governor of Manitoba. From 1887 to 1916, he was Honorary Bursar and Member of Council, University of Winnipeg, and later Visitor. He received the degree of LL.D. from the universities of Toronto, Manitoba, and Alberta, and from McMaster University. He was knighted in 1914.

**AINSWORTH, WILLIAM NEWMAN** (1872- ). An American Methodist Episcopal bishop, born at Camilla, Ga., and educated at Emory College. He was ordained in the ministry of the Methodist Episcopal Church South in 1891 and served as pastor in various churches in the South until 1909, when he became president of Wesleyan Female College, Macon, Ga., for three years. He took up his duties again as pastor in 1913 and was elected bishop in 1918. The degree of D.D. was conferred on him by Emory College in 1905 and by the University of Georgia in 1914. Baylor University made Bishop Ainsworth an LL.D. in 1920.

**AIR BOMBS**. See **BOMBING OF VESSELS BY AIRCRAFT**.

**AIRCRAFT**. See **AERONAUTICS**.

**AIRCRAFT CARRIER**. See **VESSEL, NAVAL; SHIPBUILDING**; etc.

**AIRCRAFT GUNS**. See **SMALL ARMS**.

**AIR DEFENSE**. See **BOMBING OF VESSELS BY AIRCRAFT; NAVIES**.

**AIRPLANE**. See **AERONAUTICS**.

**AIRSHIPS, NAVAL, U. S.** See **NAVIES, United States**.

**AISHTON, RICHARD HENRY** (1860- ). An American railway official, born at Evanston, Ill., and educated in the public schools. He entered the railroad service in 1878 as axman in the engineering corps of the Chicago and Northwestern Railway. After holding various other positions in the same company, he became assistant superintendent in 1895, division superintendent in 1897, general superintendent in 1899, assistant general manager in 1902, and general manager of lines east of the Missouri River, in 1906. From 1910 to 1914 he was vice president in charge of operation and maintenance, and from 1916 to 1920, president. He was director of the Western division of railways under the United States government from 1918 to 1920. In the latter year, he became president of the American Railway Association.

**AISNE, BATTLES OF THE**. See **WAR IN EUROPE**.

**AITCHISON, CLYDE BRUCE** (1875- ). A



United States interstate commerce commissioner. He was born at Clinton, Iowa, and educated at Hastings College (Nebraska) and the University of Oregon. He was admitted to the Iowa bar in 1896 and to the Supreme Court of the United States in 1908. From 1896 to 1903, he practiced at Council Bluffs, Iowa, going to Portland, Oreg., in the latter year. In 1905-06 he was secretary of the commission to revise the tax and revenue laws of Oregon. From 1907 to 1916, he was a member of the Railroad Commission of Oregon and of its successor, the Public Service Commission, and was twice chairman. He was solicitor for the National Association of Railway Commissioners in 1916-17; in the latter year, by appointment of President Wilson, he became a member of the Interstate Commerce Commission and served as chairman, 1919-20 and in 1925. He wrote *Annotation of Iowa Decisions* (1902).

**AITCHISON, JOHN YOUNG** (1868-1926). An American Baptist clergyman, born at Cascade, Iowa, and educated at Central College, Pella, Iowa, Des Moines College, and the Divinity School of the University of Chicago. He occupied pulpits at Wasco, Ill. and Maywood, Ill., before he was ordained in the Baptist ministry in 1896, and held various pastorates in the Middle West until 1909. He was secretary of the American Baptist Home Mission Society at Chicago, 1909-12, and in the latter year was made joint district secretary of the American Baptist Home Mission Society and the American Baptist Foreign Mission Society. In 1916 he became home secretary of the American Baptist Foreign Mission Society. From 1919 to 1924, Dr. Aitchison served as general director of the General Board of Promotion of the Northern Baptist Convention, which proposed to raise \$100,000,000 for the church. In 1924 he was selected by the trustees of the University of Chicago as assistant to the president, Dr. E. D. Burton, with a special view to augmenting, through his efforts, the capital resources of the institution. In the 18 months of his work, the endowment fund was increased by nearly \$700,000. Dr. Aitchison, who received the degree of D.D. from Des Moines College in 1904, was considered an able administrator and one of the leaders of his denomination.

**AITKEN, ROBERT INGERSOLL** (1878- ). An American sculptor (see VOL. I.) His works at the Panama-Pacific International Exposition in San Francisco in 1915, "The Fountain of the Earth" and "The Four Elements," won the silver medal for sculpture and in the same year he received the medal of honor of the Architectural League of New York for sculpture. The National Academy's Watrous Medal was awarded to him in 1921. He designed the \$50 gold piece struck by the United States Government in commemoration of the Panama-Pacific Exposition, and the Missouri Centennial half-dollar. Among numerous monumental works executed by Mr. Aitken may be mentioned the George Rogers Clark monument at the University of Virginia, the bronze group, "Light," in Nela Park, Cleveland, Ohio, the colossal bronzes, representing the Missouri and Mississippi rivers, at the Missouri State Capitol, Jefferson City, Mo., and the Liberty memorial, Kansas City, Mo. Mr. Aitken was commissioned captain in the United States Army in 1917 and was assigned to a machine gun company. After the World War, he executed a number of war memorials, notably the marines'

monument at Paris Island, S. C., and the Liberty Memorial at Kansas City, Mo. He became an instructor in sculpture at the Art Students' League, New York, and later at the schools of the National Academy of Design. He was president of the National Sculpture Society and vice president of the National Institute of Arts and Letters, as well as member of leading art societies of the United States and France.

**AKELEY, CARL ETHAN** (1864-1926). An American explorer, naturalist, and inventor. He was born in Orleans County, N. Y., and received his education at the State Normal School, Brockport, N. Y. He began his work with the Field Museum in Chicago in 1895 and with the American Museum of Natural History in New York City in 1909. During the World War, Mr. Akeley served with the United States Army as consulting engineer and also in the Emergency Fleet Corporation as special assistant in the concrete department. He invented the cement gun, the Akeley camera, and other devices. He studied big game in Africa, making four trips there for that purpose, and died at Kabale, Uganda, while on a tour of East Africa to obtain specimens for the American Museum of Natural History. He wrote *In Brightest Africa* (1923).

**AKINS, ZOE** (1886- ). An American poet and playwright, born at Humansville, Mo. She was educated at home and at Monticello Seminary, Godfrey, Ill., and Hosmer Hall, St. Louis, Mo. She began her literary career as a contributor of poems and criticisms, with other writings, to *Reedy's Mirror* and other magazines, but she turned soon, with much success, to the producing of plays. She published *Interpretations* (a volume of poems) in 1911, and *Cake Upon the Waters*, a novel, in 1919. Among her numerous dramatic works are the following, with the years of production given: *Papa* (1919); *The Magical City* (1919); *Déclassée* (1919); *Footloose* (called also *Forget-Me-Not*) (1920); *Daddy's Gone a-Hunting* (1921); *The Varying Shore* (1921); *Greatness*, called also *The Teasas Nightingale*, (1922); *A Royal Fandango* (1923); *The Moon-Flower* (from the Hungarian, 1924); *First Love*, an adaptation (1926), and *Thou Desperate Pilot* (1927). Leading actresses of America, including Ethel Barrymore, Marjorie Rambeau, the late Emily Stevens, Elsie Ferguson and Jobyna Howland, have appeared in Miss Akins' plays.

**AKRON.** A manufacturing city of Ohio. The population increased from 69,067 in 1910 to 208,435 in 1920 and, according to local estimate, to 227,000 in 1928. The area in 1928 was 30 square miles. The adjoining suburb of Kenmore was annexed by popular vote of both municipalities in January, 1929, thus adding a population estimated at 13,500. The city adopted a charter of the city-manager type in 1920, but reverted to its old form in 1924. A city-planning commission was appointed and a comprehensive zoning ordinance was adopted Aug. 15, 1922. In 1915 a new municipal water system was established which represented an investment of about \$13,000,000. It included a reservoir in the Cuyahoga River, with storage capacity of 2,385,200,000 gallons, a complete purification system, and a pumping station. North Hill viaduct over the Cuyahoga River was opened in 1922. Elimination of the railroad grade crossings on the main lines of the Pennsylvania, Erie, and Baltimore & Ohio railroads through the city was undertaken in 1924. In

1929 a municipal airport was established on an 890-acre tract about four miles from the centre of the city. An immense hangar was built by the Goodyear-Zeppelin Corporation for the construction of airships for the U. S. Navy. Akron is the rubber manufacturing centre of the world. In 1923, 53,000 persons were employed in this industry. Approximately 55 per cent of the tires and inner tubes manufactured in the United States are produced in Akron. Akron also has important clay products, and cereal and fishing-tackle industries. The assessed valuation of property in Akron in 1927 was \$366,726,000; the net indebtedness was \$37,759,000.

**AKRON, THE UNIVERSITY OF.** A coeducational institution at Akron, Ohio, founded in 1872 as Buchtel College, taken over by the city, and re-named in 1914. Buchtel College was retained as the name of the college of liberal arts of the university, which also comprised in 1928 a college of engineering, Curtis School of Home Economics, Teachers College, and a school of commerce and secretarial science. The number of day students enrolled increased from 198 in 1914 to 1128 in the autumn of 1928; the evening session enrollment totaled 1300; and the summer session in 1928 had an enrollment of 549. The number of faculty members increased from 23 to 93 during the years 1914-1928; and the number of catalogued volumes in the library from 10,000 to 27,000. The endowment of the university in 1928 amounted to \$70,582 and the income for 1927-28 was \$346,000. In 1920 bonds were issued to the amount of \$150,000, for the enlargement of the engineering laboratory; in 1923 the alumni raised \$35,000 for the erection of a stadium seating 8000 persons; Teachers College was erected in 1921, in coöperation with the Akron Board of Education; and a new department of speech was created in September, 1928. The art collection, valued at \$25,000, from the estate of Miss Harriet Phillips, a former resident of Akron who died in 1928, was given to the university. President, George Frederick Zook, Ph.D.

**ALABAMA,** āl'a-bū'mā or bām'ā. The twenty-eighth in size among the States (51,998 square miles) and the eighteenth in population; capital, Montgomery. The population on July 1, 1928, was estimated at 2,573,000. It increased from 2,138,093 in 1910 to 2,348,174 in 1920. The white population increased from 1,228,832 to 1,447,032; the Negroes decreased in number from 908,282 to 900,652. The native white population rose from 1,209,876 to 1,429,370, while the relatively small foreign-born population decreased from 18,956 to 17,662. Both urban and rural populations mounted, the former from 370,431 to 509,317, the latter from 1,707,662 to 1,838,857. The populations of the largest cities increased thus: Birmingham, from 132,685 to 178,806; Mobile, 51,521 to 60,777; Montgomery, 38,136 to 43,464.

**Agriculture.** In Alabama, agriculture was affected greatly by the ravages of the cotton-boll weevil, which became serious about 1912. The boll weevil had spread through the cotton-growing area by 1915. Its effects were shown both in the production of cotton and the area devoted to it. The cotton-growing area declined in the first twelve years of the weevil by about 1,000,000 acres. This loss was recovered by 1926, while the production declined about 400,000 bales, or about 35 per cent, but recovered the loss by 1926. While cotton for many decades

occupied from 36 to 38 per cent of all the cultivated land in Alabama, in 1920 the proportion was 26.6 per cent. The acreage of cereals increased sharply, that of corn especially. There was also a considerable increase in the growth of forage crops and in the raising of hogs and some other live stock.

While the population of the State increased 9.8 per cent during the decade 1910-20, the number of farms decreased 2.0 per cent, or from 262,901 to 256,099, and to 237,631 in 1925. Acreage fell from 20,732,312 (1910) to 19,576,856 (1920) and 16,739,000 (1925). There was, however, a slight increase in the improved land in farms. The total value of farm property increased from \$370,138,429 in 1910 to \$690,848,720 in 1920, but declined again to \$500,740,322 (1925); the average value per farm moved from \$1408 (1910) to \$2698 (1920) and to \$2107 (1925). The shift was largely attributed to the nationwide alteration of values.

The percentage of all land used for agricultural purposes in 1910 was 63.2; in 1920, 59.7; in 1925, 51.0. The percentage of improved farm land, however, increased. Of the total number of farmers in 1925, 92,948 owned their farms, 448 were managers, and 144,235 were tenants. There was an increase, long continued and still in progress, of owners, with a decrease in tenants. The white farmers in 1920 numbered 160,896 and the colored farmers, 95,205 in 1920 and 83,460 in 1925. Of the white farmers in 1925, 76,835 owned their farms; of the colored farmers, 14,419. There was a decrease in the Negro population, 1910-20, of nearly 1 per cent compared with an increase of nearly 10 per cent in the preceding decade, which noticeably affected the farm-labor situation. The number of owner-operated farms that were under mortgage in 1925 was 27,790, or 29.9 per cent of the total number of such farms. Live stock showed no considerable increase from 1920 to 1925. In 1920 the total number of dairy cows was 491,163; in 1925, 490,189; swine, 1,496,893 in 1920 and 826,833 in 1925. The estimated production of the chief farm crops of 1927 was as follows: Corn, 47,456,000 bushels; oats, 1,768,000; potatoes, 2,475,000; sweet potatoes, 7,350,000 bushels; hay, 531,000 tons; cotton, 1,200,000 bales. Comparative figures for 1913 were as follows: Corn, 55,360,000 bushels; oats, 6,652,000; potatoes, 1,512,000 bushels; hay, 286,000 tons; cotton, 1,495,000 bales.

**Education.** Educational conditions in Alabama showed a marked improvement, especially after 1918. A new school code was enacted by the Legislature in 1919, following a careful study of the school system of the State by representatives of the Federal Bureau of Education under the direction of the Alabama Education Commission. In 1927 the Legislature passed a unified education bill and made appropriations to provide a seven-month minimum school term. In 1925-1926 the white enrollment, elementary and secondary, was 408,323; in 1921, 358,743. For Negroes, the enrollment in 1925-1926 was 182,082; in 1921, 164,340. According to statistics of the United States Bureau of Education, there was a total enrollment in the elementary and kindergarten schools of the State, 1925-1926, of 538,984, and in the secondary schools, 51,421, or a total enrollment in that year of 590,405. High-school enrollment of Negro pupils, from 1780 in 1921, rose to 3435 in 1925-1926.

Consolidation made considerable progress. In

1925-1926 there were 450 consolidated school buildings in the State. Fourteen county training schools for Negro pupils are maintained and summer schools for Negro teachers are conducted during the year. Illiteracy in the State showed a marked decrease from 26.2 per cent in 1910 to 20 per cent in 1920; among native whites, from 11.5 to 8.3 per cent; and among the Negroes, from 46.4 to 38.8 per cent.

**Manufactures.** The industrial development of Alabama during and since the World War has been extensive. Great plate mills, costing over \$12,000,000 were constructed in Birmingham in 1917 by the Tennessee Coal, Iron & Railroad Co., and huge shipbuilding plants were erected by subsidiaries of the same company at Mobile. At Muscle Shoals, the site of a great war-time Federal power development, atmospheric nitrogen was produced in October, 1917, with electric current brought nearly 100 miles from a steam-generating station. The Federal Railroad Administration in 1919 decided to utilize the Warrior River for coal and iron traffic to Mobile and the Gulf, and purchased barges and equipment for the purpose. The river was opened to navigation in 1920. River terminals were built at Shore Creek in the Warrior River to handle the traffic. Industrial progress in the State was hampered somewhat by coal-mining strikes in 1919 and 1920. Another notable feature of water-power development during 1920 was the joining of the Alabama power lines with those of Georgia, between Gastonburg, Ala., and Rome, Ga. By means of this connection, Alabama water power is supplied for the mills of North Carolina and South Carolina during the low-water periods in those States, while when the rivers are low in Alabama, power from North Carolina and South Carolina is brought in. The manufacture of high-grade phosphoric acid by the use of electric power was developed at Anniston in 1920. In 1921 work undertaken to raise the height of the dams of the Warrior River to insure a depth of 8 feet during the entire year, from Mobile to Birmingham, was completed. In the same year, the Alabama Power Company began work which was finished in 1922 on its new dam at Duncan's Riffle on the Coosa River, to develop 120,000 horse power.

The Federal hydroelectric power plant of Muscle Shoals on the Tennessee River, begun in war time, was gradually constructed in subsequent years. It had four 30,000-horsepower turbine generators, actuated by the waters of the Wilson Dam, in operation at the end of 1925.

There has been rapid and continued industrial development of the State. The number of manufacturing establishments increased from 3242 in 1914 to 3654 in 1919 and diminished to 2349 in 1925, and to 2355 in 1927. But the number of manufacturing wage earners increased from 78,717 in 1914 to 107,159 in 1919, to 118,599 in 1925, and to 119,093 in 1927. The capital invested increased from \$227,505,432 in 1914 to \$455,592,733 in 1919; and the value of products rose from \$178,797,633 to \$492,732,895 (1919), to \$552,824,000 (1925), but fell to \$550,372,126 (1927).

The chief manufacturing industries in 1919 were: Cotton goods, with a product valued at \$70,643,000; iron and steel works and rolling mills, \$64,980,000; iron and steel blast furnaces, \$57,018,000; and lumber and timber products, \$55,139,000. The chief manufacturing city in the State is Birmingham, which is one of the most

important iron and steel manufacturing cities in the country. During the War, Mobile was important as a shipbuilding centre. The steel ships manufactured, according to the census of 1919, amounted to \$15,909,618.

**Mining.** The important mineral products of Alabama are coal, iron ore, cement, and clay products. Coal mining was hampered greatly by a protracted strike in 1921. The coal production in 1913 was 17,687,522 net tons. In 1915 the output amounted to 14,927,937 net tons. In 1916 there was a considerable increase, the total coal mined in that year being 18,086,197 tons. There was an increase of approximately 2,000,000 tons in 1917 and 1918. In 1919 the output fell again to 15,536,721 net tons. In 1920 the output remained about 16,000,000 tons, fell to 12,570,000 tons in 1921, and thereafter recovered, being 21,000,962 net tons in 1926, 19,765,866 tons in 1927, and 17,621,362 tons in 1928, valued at \$39,601,000. The production of iron ore in 1914 was 4,838,959 gross tons, compared with 5,215,740 tons in 1913. In 1915 the production was 5,309,354 tons, but in 1916 there was an increase of over 27 per cent, or a production of 6,747,900 tons. In 1917 there was a slight increase in value of shipments and in the quantity mined. The value of the shipments in 1918 was 14 per cent less than the previous year. There was a continued decrease in 1919, both in quantity and in value. In 1920 the total production was 5,804,000 gross tons. In 1921 the production was 2,876,141 gross tons. In 1921 the shipments were 2,835,761 gross tons, but in 1926 yearly production had again risen, reaching 6,871,412 long tons. In 1927, 6,508,419 tons were produced. Alabama ranks third in the production of iron ore. The manufacture of coke is an important industry. The production is between 3,000,000 and 5,000,000 net tons, but in 1921 it decreased sharply to 2,531,030. As a whole, the mineral production of the State increased from \$30,879,288 in 1914 to \$83,709,894 in 1926. The State ranked eighteenth in 1926 in the value of its mineral products. The census figures for 1919 show a total value of the products of all mines and quarries in the State as \$59,866,040. The total for 1925 was \$77,139,340.

**Finance.** State expenditures in the year ending Sept. 30, 1927, as reported by the U. S. Department of Commerce, were: For maintenance and operation of departments, \$10,197,071 (of which \$4,428,505 was for educational purposes); for interest on debt, \$1,673,520; for permanent improvements, \$12,005,632; total, \$29,944,408 (of which \$9,140,645 was for highways, \$741,659 being for maintenance and \$8,398,986 for construction). Revenues were \$21,999,125, of which property and special taxes provided 38.9 per cent; State departments' earnings, 16.6 per cent; licenses, coal and ore tonnage taxes, and gasoline tax, 31.6 per cent. Property valuation was \$1,121,993,430; State taxation thereon, \$7,292,957. Net funded State debt, Sept. 30, 1927, was \$41,544,136.

**Political and Other Events.** The State remained overwhelmingly Democratic until the presidential campaign of 1928, in which elements hostile to the candidacy of Alfred E. Smith sought to bring about a party defection. Oscar W. Underwood was elected United States Senator in 1914, to succeed Joseph F. Johnston, who died in 1913; Charles Henderson was chosen Governor of the State. Prohibition became effective in the State on July 1. In the presidential elec-

tion of 1916, President Wilson received a plurality of 68,969 votes. The State, during 1917, had remarkable industrial development, much of it traceable to the War. Thomas E. Kilby was elected governor in 1918, and John H. Bankhead to the United States Senate. In 1920 the Legislature submitted to the voters an amendment to the constitution providing that in order to register a vote the elector must be of good character and must understand the duties and responsibilities of citizenship. This amendment was designed to bar undesirable females of the Negro race from voting. Senator Bankhead died on Mar. 1, 1920, and former Gov. B. B. Comer served as Senator by appointment until November. J. Thomas Helin, member of Congress was then elected Senator and Underwood was re-elected. For President in 1920, Cox received 163,254 votes and Harding, 74,690. In 1920-21 a bitter coal-miners' strike caused disorder, but the efforts to place the mines on a closed-shop basis failed. The semi-centennial of Birmingham was celebrated in October, 1921. In 1922, W. W. Brandon was elected governor. Governor Brandon pledged himself to continue the programme of social reform in the State which had marked the administration of Governor Kilby. The term of the latter had been notable for providing for the future abolition of the convict-leasing system, the building of new and improved prisons, enlarged schools, and other reform measures.

In 1924 at a Democratic presidential preference primary held in April, Senator Underwood was selected as the choice of the State for the party nomination, and accordingly he had the support of the Alabama delegation throughout the long balloting at the National Convention in New York. A great hydroelectric power development on the Tallapoosa River, near Cherokee Bluffs, was begun in 1925, with a dam designed to impound 530,000,000 gallons of water and a generating station with three 45,000-horse-power turbines. In 1926 Bibb Graves was elected governor by the Democratic vote, with Hugo L. Black as United States Senator and all ten incumbents of the State delegation in the House of Representatives. The death of a convict at Flat Top Mine Camp led to renewed sentiment against the convict-leasing system and to investigation which cast suspicion of fatal ill-treatment in the cases of several other convicts. The resulting agitation hastened the termination of the convict-leasing system by the Legislature of 1927. Proceedings were undertaken by State Attorney General McCall in 1927 against persons accused of numerous floggings attributed to the activities of the Ku Klux Klan, mainly in Crenshaw County, but it was found difficult in these State prosecutions to prevail upon the juries to convict. In Blount County, however, a number of the floggers were sentenced. The vote for President in the election of 1928 was: Smith, 127,796; Hoover, 120,725.

In March, 1929, Alabama suffered from disastrous floods.

State highway projects in Alabama completed in the fiscal year ended Oct. 1, 1928, comprised 288.17 miles of road, costing \$3,840,938. In the same period 6391 linear feet of bridges were constructed, at a cost of \$694,157. Under construction on October 1 were 954.57 miles of road, to cost \$7,010,284, and 30,282 feet of bridges, to cost \$1,914,357.

**Legislation.** The Legislature of Alabama

meets every four years. A proposed amendment to make the session biennial was defeated in 1916. The Legislature in the same year passed six constitutional amendments relating chiefly to taxes and the banking system of the State. The Legislature of 1919 refused to ratify the woman-suffrage amendment. The same Legislature passed a workmen's-compensation law, an income-tax law which was later declared unconstitutional, and a measure penalizing combinations or agreements to strike. In the same year, it adopted an 8-hour day and a 48-hour week for children under the age of 16 years in all gainful occupations. An elective workmen's-compensation law was also enacted. The Legislature of 1923 deferred the effective date of the new law abolishing the convict-leasing system for four years.

The Legislatures of 1923 and of 1927 made large appropriations for road construction and for the development of State docks and other improvements at the port of Mobile. Provision was finally made in 1927 for the termination of the convict-leasing system and for a transfer of convicts from county to State custody. The 1927 session of the Legislature treated the public schools liberally, submitting to the voters of the State a constitutional amendment to permit the issue of \$20,000,000 of bonds to finance school construction; this proposal, however, was defeated by popular vote Jan. 10, 1928. The Legislature also passed measures to furnish aid to districts, so as to enable them to keep their schools open for at least seven months a year. The death penalty was changed from hanging to the electric chair.

**ALABAMA, UNIVERSITY OF.** A coeducational State institution at University, Ala., founded in 1831. The registration showed a marked increase between 1913, when there were 652 students, and the autumn term of 1928, when there were 3001 students, with an increase in summer-school enrollment ranging from 562 to 1873 during the same period. The faculty increased from 89 to 136, of whom 36 were new appointments in 1928; the number of volumes in the library increased from 30,600 to 75,000 (including 20,000 government documents); and the endowment was raised from \$545,000 to \$1,857,988. A new library was erected in 1925 at a cost of \$200,000 and a building to contain a supply store, post office, and cafeteria was completed at a cost of \$100,000, while gifts to the amount of \$120,000 were received during the year. In 1926, a chemistry building was added at a cost of \$200,000; in 1928 a new commerce building was completed, and a women's building for art, music, and home economics and an education building were under construction. President, George H. Denny, Ph.D., LL.D.

**ÅLAND ISLANDS,** Ålän P'landz, or Ålän. An archipelago made up of one large island and some 300 small ones at the entrance of the Gulf of Bothnia. Their inhabitants in 1920 numbered 26,911; estimated in 1926, 27,234. From 1917 to 1921 the islands were the scene of unwonted turmoil. The work of the Russian Revolution of 1917 left its impress on the minds of the Ålanders, who, because they were bound to Sweden by ties of language, custom, and trade, proceeded to express their wish to be reunited to Sweden by a plebiscite in August, 1917. But the newly constituted State of Finland was opposed to the cession, offering as an alternative the establishment of local autonomy in the islands. It was

plain, however, that Alanders regarded union with Sweden as the only feasible plan. On the ground of self-determination, they appealed to the Allied peoples in November, 1918. In February, 1919, their case was presented again before the Paris Peace Conference. But the Supreme Council denied its jurisdiction, so that in 1920 the dispute was placed before the League of Nations. A commission appointed to ascertain the state of opinion in Sweden, Finland, and the Aland Islands, reported back to the League Council in June, 1921. On June 24, the Council announced as its decision that the islands were to continue as a part of Finland, but were to be neutralized with respect to military matters and also be guaranteed full local autonomy. Sweden protested, but accepted the ruling and the islands reverted to Finland. There is a county council or *landsting* of one chamber, which settles the internal affairs of the Government. There is an executive council with a *landtråd* as president.

**ALASKA.** The period since 1914 has been marked by important changes in Territorial affairs. From 1914 to 1918, Alaska suffered economic and industrial depression incident to the War, which materially reduced the population by drawing recruits for the Army and Navy and affected commerce. The census of January, 1920, numbered a population of 55,036, a decrease in ten years of 9320, of which only one-fifth was natives. There appeared also certain other adverse features: reduction in mineral output, temporary diminution of commerce, and overfishing of salmon. Encouraging features were many: reorganization of government with a local legislature; enactment of progressive laws; increase of the fur-seal herds and renewal of the catch; utilization of forest resources; enlarged copper production; development of coal mines; improved roads; increase and scientific care of reindeer; land surveys; more productive farms; and especially the completion of the Alaska Government Railroad, to the central mining districts of the Yukon watershed. A College of Agriculture and Mining was established. Natives improved their sanitation and built better houses. Action by Congress, long urged, to coordinate Federal control was taken in the Act of Feb. 10, 1927, creating three commissioners, to be appointed by the Federal Secretaries of the Interior, of Commerce, and of Agriculture, respectively, to reside in the Territory and to exercise wide administrative powers.

**Agriculture.** The agricultural station at Matanuska established a creamery in 1927. That at Fairbanks raised 60 tons of wheat. A station at Sitka tests culture of fruits and vegetables. In the districts of Anchorage, Fairbanks, and Matanuska, there are 90 farms, where stock does well. The crops are barley, oats, spring wheat, winter rye, and winter wheat.

**Population.** The population decreased from 64,356 in 1910 to 55,036, one-fifth of which was natives, in 1920. The loss of 1249 natives was due to epidemics of influenza. The great bulk of the decrease was due to enlistment in military service. Diminished activity in gold mining has had an adverse effect on the population total.

**Government.** The governor, surveyor general, and judges of the four judicial districts are appointed by the President of the United States for four years. The Territory is represented in Congress by a Delegate, who has no vote. Under the Act of Congress of Aug. 24, 1912, its Legislature, with limited powers, consists of a Senate

of eight members, two elected from each judicial district for four years, and a House of sixteen, elected likewise. Beginning in 1913, the legislature met biennially. Its laws are subject to veto by Congress. The divided and inefficient methods of Federal control of Alaskan affairs had long been recognized, and Congress created in 1927 resident commissioners of the Departments of Agriculture, Commerce, and the Interior. When mineral output and fisheries, by their decline, first brought matters to a crisis, Congress voted money for a government railway. Executive measures were next taken to remedy business methods and save the situation. Upon the recommendation of a board of experts, the President authorized the creation of a permanent Inter-Departmental Commission on Alaska, with these functions: "To coordinate and bring together facts and suggestions touching matters affecting Alaska, and make recommendations for definite action . . . that duplication may be avoided and efficiency secured." As a result, affairs under Federal control were being handled more efficiently, commencing with 1924. Congress meanwhile took minor action on general land leases, reindeer, and land fur animals.

**Finances.** The revenue is derived from the license taxes, both Federal and Territorial. On Jan. 1, 1924, there was a balance in the treasury of \$218,345. The Federal taxes form the Alaskan Fund, of which 65 per cent is spent on roads; 25 per cent, on schools outside of incorporated towns; and 10 per cent, for relief of indigents. This fund received \$256,713 in 1927. The Territorial Treasury balance on June 30, 1927, was \$1,104,613.

**Banks.** The 17 banks (four of them National) had in 1926 capital, surplus, and undivided profits of \$1,346,000 and resources of \$12,522,000.

**Education.** An Agricultural College and School of Mines was established. Territorial appropriation for educational purposes in 1927 was \$1,001,350. In 1925-26 there were 12 public high schools with 40 teachers and an enrollment of 289 male and 257 female pupils. In 1926-27 there were 86 native schools maintained by the Federal Government under the Alaska Division of the Bureau of Education, with 107 teachers and an enrollment of 3616 pupils maintained at a total cost of \$437,700. In 1926-27 there were 4915 pupils enrolled in white schools which were conducted by 232 teachers with expenditures of \$502,661.

**Forests and Parks.** The important resources of the national forests—Tongass, 15,444,000 acres, and Chugach, 5,130,000 acres—amount to an estimated stand of 75,000,000,000 board feet. In 1926, 55,761,000 board feet were cut for commercial use besides the large quantities free to settlers. Surveys have been made at localities suitable for combined pulp mills and water power. Agricultural and mining lands have been largely segregated. In 1927 two contracts were awarded for private exportation of pulpwood in Tongass Forest, each providing five billion feet and water-power sites. See **FORESTRY**.

**Commerce.** Owing largely to war disturbances, Alaskan commercial shipments were seriously affected. From 1918 the volume of trade fell sharply but irregularly to and including 1921. It improved thereafter through 1926, when exports to the States attained \$73,300,506 and imports, \$31,587,337. An exceptional salmon catch in 1926 contributed to the export total.



In 1927 lower prices for copper and reduced fishery output led to exports of \$51,348,688, while imports rose to \$35,604,108. In 1928 exports were \$67,587,207 and imports \$32,037,335. Exports of canned salmon in 1928 totaled 280,981,615 pounds, valued at \$45,548,683. Alaska's exports to foreign countries in 1928 were valued at \$622,738 and imports, at \$559,262.

Natives. The Eskimo and Indian inhabitants are gradually taking more prominent parts in the activities of the Territory. This is especially true in southeastern Alaska, in the cannery settlements, and at other industrial centres. The efforts of the Alaska Division of the Bureau of Education to improve the condition of the natives has met with encouragement. Under the direction of its agents, doctors, nurses, teachers, herders, etc., modern methods of sanitation, comfortable dwellings, more gardens, better schools, and higher standards generally have been promoted in many remote villages. Efficiency in industrial training has been followed by the organization of special settlements, entirely native, and the formation of coöperative associations, which are being successfully managed. Both the Metlakatla colony on Annette Island and the Indian town of Hydraburg are modern communities with canneries, mills, electric power, coöperative associations, etc. Noorvik, on Kotzebue Sound near the Arctic Circle, has, with other modern plants, an electric-lighting system. The natives in southeastern Alaska have taken important parts in the activities of that section, as clergymen, nurses, teachers, engineers, and navigators. In 1922, 4192 natives were employed in the Alaskan salmon canneries. The life conditions of many Eskimos in remote regions, especially those located in the marshy, unhealthy deltas of the Yukon and Kuskokwin rivers, were still distressing. Special efforts, with prospects of success, have been undertaken to better them.

Fisheries. From year to year the fishery industry has held its position as the most productive of the Territory. The aggregate yearly value of fish shipped is twice to thrice that of metals exported. The total value of fishery products to Jan. 1, 1924, was \$560,231,000. In its maximum year, 1918, the industry employed 31,213 persons; its investments in 1922 aggregated \$45,208,000. The value of the annual output increased from \$15,739,000 in 1913 to \$59,844,850 in 1918. Decreases followed to \$24,087,000 in 1922, whence the total again rose, being \$54,669,882 in 1926-27. The more important catches, in the order of value, are salmon, herring, halibut and cod. Far exceeding in importance other species, the salmon is the most valuable factor in Alaskan prosperity. The number of salmon caught and their value increased from 54,651,915 fish, \$19,594,381, in 1914, to 101,454,688 fish, \$53,464,812, in 1918. Of the salmon catch, 95 per cent is canned. The great catch of 1918, which counted 6,505,535 cases, 48 one-pound cans to a case, fell off alarmingly, 60 per cent, to 2,596,826 cases in 1921. There was an increase to 4,502,000 cases in 1922 and another unimportant increase in 1923. In 1927 the product of the salmon industry was valued at \$32,361,767.

Although it was evident that commercial over-exploitation was destroying the salmon-spawning grounds, endangering the food supplies of the natives and ruining a most valuable national asset, Congress failed, despite urgent requests,

to modify the old and inadequate law regarding Alaskan fisheries. The executive departments were obliged to adopt stringent measures, as far as the Federal laws permitted. By executive orders of the President in 1922, two fishery reservations were created, the Alaskan Peninsula and the Southwestern. Under date of Oct. 25, 1923, regulations for fisheries on these and on the Aleutian reservations were issued. Fishing by the inhabitants is permitted for personal use, but corporations can fish only when licensed and under restriction set forth in these rules. The herring industry was steadily expanding, due largely to the introduction of the Scotch method of curing pickled herring. The maximum value of \$2,329,116 came in 1922. Over-supply, storms, and decreased productivity had reduced the halibut catch, which in 1922 amounted to 11,000,000 pounds, but rose to 17,000,000 pounds in 1927. Cod fell off in quantity and value from the maximum of 1918. The 6,135,000 pounds caught in 1922 had a value of \$464,169 and later declined yet more. A revival of the whale industry in 1922 resulted in the catch of 445 animals valued at \$409,168. Of whale oil, 947,514 gallons were shipped in 1927. See FISHERIES.

The fur-seal industry was formerly the most important in Alaska. The rookeries of the Pribilof Islands were estimated in 1867 to contain 4,000,000 seals. The herds were nearly exterminated by uncontrolled slaughter and by pelagic hunting, so that by 1910 they contained only one-twentieth of the former number. By the treaty of 1912 between Great Britain, Japan, Russia, and the United States, pelagic sealing was made unlawful. Congress then enacted that the fur-seal industry should be a government monopoly, made the Pribilof Islands a closed reservation to be governed by a commission of experts and established a closed season so that the herds might recuperate. Under an excellent system of protection, the herds were slowly but steadily increasing, their number rising from 294,687 in 1914 to 604,692 in 1923. During the decade, the taking of seals was renewed, and about 30,000 animals were killed annually, the number varying from 25,318 in 1918 to 34,890 in 1919. The percentage of yearly increase was falling off, being in 1924 about 4.0 annually. The skins are sold at public auction and the profits of the industry are in general \$1,000,000 a year above the cost of the service. Improved methods of taking pelts were adopted and the fitting of the skins for the market, formerly done in England, became an American industry. The fur-seal industry gives employment to the 337 natives on the reservation.

From about 150,000 head in 1914, the reindeer had increased in number by 1927 to over 500,000. The enormous numbers, however, caused conflicts as to pasturage, introduced diseases, and led to decadence, so that the Biological Survey had to be called upon for aid in locating suitable grazing areas, in combating diseases, and in improving herd management. Two-thirds of the deer were owned by the natives; the other third was being commercially exploited. The plan of introducing the meat of the reindeer to the markets of the Pacific coast was successful, but its extent was at first limited through lack of sufficient cold-storage plants on the commercial steamers. Originally introduced into the Bering Sea region, efforts were inaugurated in 1924 to distribute the reindeer

so as to benefit the largest number of natives. Herds on the Aleutian and Pribilof Islands thrive, as also in the Matanuska Valley and in the Broad Pass region.

The destruction of the land game, which at one time was threatened, was stopped by means of closed seasons, game wardens, and custom inspections. The Bureau of Biological Survey took the matter in hand upon the transfer of these duties to the Department of Agriculture, under the Act of Congress of May 31, 1920.

**Minerals.** The total mineral output to Jan. 1, 1927, amounted to \$571,000,000. The total output through 1922 was: Gold, \$335,526,000; copper, \$145,479,000; silver, \$8,834,000; coal, \$2,723,000; tin, \$938,000; lead, \$772,000; antimony, \$237,500; marble, petroleum, etc., \$3,476,000. Mineral production was \$1,000,000 in 1892; it reached its maximum product of \$48,632,212 in 1916, and fell irregularly to \$17,000,000 in 1921. The estimated product for 1926 was \$17,606,890. The maximum single year's output of *gold* was \$15,627,000 in 1916. Output decreased to \$6,150,000 in 1923 and rallied to \$6,707,000 in 1926. The decreases were primarily due to the increased cost of mining, gold value being fixed. Placer mining was slowly passing as individual ventures were replaced by dredges. The summer placer miners fell off from 4000 in 1913 to 410 in 1923. Quartz mines were increasing in number and average product. The change in *silver* output values, from \$219,000 in 1913 to a maximum of \$1,039,000 in 1920 and to \$600,000 in 1923, was due to its being almost entirely a by-product, though galena ore was being mined in the Kantishna district. Silver to a total value of \$430,500 was produced in 1926.

Largely owing to the War, copper became the most valuable mineral of the Territory. In 1914 six mines produced 21,660,000 pounds, valued at \$2,852,934. Under pressure, eighteen mines produced 119,655,000 pounds, worth \$29,484,291, in 1916. Although the output fell to 47,221,000 pounds in 1919, it rose to 86,000,000 in 1923. Most of the copper came from the Kennecott group and the Beatson-Bonanza mines. In 1926, 67,778,000 pounds, value \$9,489,000, were produced. From 28 tons in 1914, the production of *lead* exceeded 800 tons in three separate years. The maximum value was \$146,584 in 1917. The product in 1923 was worth \$60,000. The 778 tons produced in 1926 had a value of \$124,400. Low prices practically closed the tin mines.

Stimulated by the needs of the Alaska railroad under construction and operation, there were largely increased outputs of coal from mines along the line of the road. The product was almost entirely sub-bituminous and lignitic coal. The output rose from 1400 tons in 1914 to 100,000 tons in 1923. Despite constant efforts to uncover workable veins of high-grade coal in the Matanuska and the Bering River fields, difficulties of working and of transportation kept down development. Enormous reserves of low-grade bituminous and lignitic coal were located in various parts of the Territory, much of it easily accessible and cheaply mined. In 1927 much of the coal burned in Alaska was imported, imports being 35,217 tons. Up to 1924, the only *oil* produced was from the private wells in the Katalla field, which was barely sufficient to meet the local demands for gasoline. In 1922 more than 19,000,000 gallons of oil

of various kinds were imported into Alaska. Restrictions of Federal laws then made impracticable the economical exploitation of petroleum fields. Under a later law, companies began drilling in 1923 on the Alaskan Peninsula, but pronounced development had not followed, up to 1928. The Arctic Coast near Point Barrow was thought to be a promising field for oil, judging from seepages there observed. At the request and expense of the Navy Department, experts of the Geological Survey conducted an exhaustive examination of the adjacent region.

**Transportation.** The most important feature of development in land transportation is the government-built and -owned Alaska Railroad, 543 miles in length, connecting the ice-free port of Seward with Fairbanks, the centre of the Tanana mining district. Apart from the main line, the system had the following branches: Happy-Chatinka, 32 miles; Matanuska-Chickaloon, 45 miles; Healy coal mines, 4 miles. In January, 1924, there was a semi-weekly train service to and from Fairbanks, which involved two days' travel with a lay-over at Curry. The Alaska Railroad serves directly the mines of the Kenai, Susitna, Matanuska, and central Yukon districts. Traversing a rich coal region, it becomes the main source of fuel for the mines of the vast interior regions. It had already developed new mining grounds and brought farming settlers into the contiguous regions. The expenditures for the railroad up to June 30, 1923, amounted to \$56,000,000, including systems purchased, roads built and reconstructed, and operation. As the total revenue from the road during 1923 was only \$543,521, it was evident that several years must elapse before the system would become self-supporting. To replace the discontinued commercial transportation on the interior rivers, the railroad met the needs of the settlements of the lower Yukon by the establishment of a summer line of steamboats between Fairbanks and Holy Cross, where connection was made for the Norton Sound region with the launches of the Northern Commercial Company. Canadian boats in 1924 were caring for the settlers of the upper Yukon, while taking ore to Fairbanks from the Klondike region. There had been constructed 6854 miles of roads and trails up to June 30, 1923, toward which the Federal Government appropriated \$4,300,000. The main road of 410 miles, open throughout the year, is that from Valdez to Fairbanks, with a branch to Chitina. The expenditure during 1923 for construction and maintenance was \$740,000. Unfortunately, road work was done under three separate departments, two Federal and one Territorial. Such aids to navigation as lights, buoys, and signals were increased from 338 in 1915 to 779 in 1928. A radiobeacon was established at Cape St. Elias, Oct. 3, 1927.

**Telegraphy.** The importance of the signal-corps system, with its 19 cables and 44 offices, may be gauged by its messages in 1923, whose tariffs approximated \$400,000. It had 2700 miles of cables, 840 miles of land wire, and a radio system. The governor reported: "The service rendered in the progress and development of Alaska cannot be overestimated." After 20 years' use, the existing cables were inadequate for current business. New cables were purchased and were installed in the year 1924. Supplementary to the Army system was the Naval Communication Service, maintaining radio

stations of great value to the public. See also Lighthouses.

**Local Legislation.** The Legislature met biennially from 1913 to 1927. None of its Acts was vetoed by Congress. Its legislation was along progressive lines; education was fostered, labor guarded as to hours, safety, compensation, and liens; liquors and drugs were prohibited, road and fishery commission authorized, whereby coöperation with Federal bodies could be obtained; banks and corporations regulated, and the insane and indigent cared for.

**ALASTRIM.** See SMALLPOX.

**ALBANIA,** al-ba'ni-ä. A Balkan country, whose boundaries were first fixed in 1913, redrawn by the Council of Ambassadors on Nov. 9, 1921, and definitely fixed by an International Commission in 1925. Area estimated at 17,374 square miles; population, in 1925, estimated at 831,837. There were, according to a 1921 estimate, 584,675 Mohammedans; 158,215 Greek Catholics, and 88,987 Roman Catholics in the country. The estimated populations of the principal towns in 1927 were: Scutari, 32,000; Koritza, 24,000; Tirana, the capital, 12,000; Valona, 6500; Durazzo, 5000. Education was, of course, in its infancy. In 1927 there were 548 primary schools, 854 teachers, and about 24,000 pupils. There are besides 12 continuation schools, two secondary schools and a teachers' training college.

Albania, because of its mountainous nature, possesses no real means of communication and is still a primitive pastoral and agricultural society. The leading products, cereals, olive oil, tobacco, rice, and wool, are raised for home consumption, though some exchange is carried on with the neighboring Jugo-Slav market towns to the north, and with Italy. The valleys of the South are more favorable for agricultural activities, and here it is that what prosperity Albania could boast of is to be found. Natural resources reported capable of exploitation, but as yet little worked, are timber lands, coal, iron pyrites, oil, asphalt, and hydroelectric power. Trade was insignificant. In 1926, exports totaled 11,963,982 gold francs, largely to Italy, Greece, and Jugo-Slavia, and comprised skins, wool, dairy products, olives, olive oil, and tobacco; imports totaled 24,864,731 gold francs, covering purchases of cereals, fruits, oil, etc., from Italy, Greece, and Great Britain. Because of the unfavorable trade balance, a customs tariff was enacted, Feb. 5, 1922. During the War, the Austrians constructed a few narrow-gauge military railways, the most important of which was the line from Durazzo to Tirana, 23 miles. All these, however, fell into disrepair and were little used. In 1928 a railway was under construction between Tirana and Durazzo. Principal ports are San Giovanni di Medua, serving Scutari, Durazzo, and Valona. Italian boats are the only ones to call regularly. Government accounts for 1927-28 were: Expenditures, 26,100,000 gold francs; revenues, 29,000,000 gold francs, 5,496,700 in customs, and the remainder in direct taxes. In May, 1925, Albania obtained a foreign loan of 70,500,000 gold francs, guaranteed by the customs and monopolies. The proceeds were to be used for public works. In 1914, Austria and Italy extended Prince William a credit of 10,000,000 francs; these claims were really eliminated, however, by the revenues collected by Austrians and Italians during the war occupation and retained at Vienna and Rome.

**History.** The conflicting interests of Russia, Austria, and Italy left much to be desired in the Albanian settlement of 1913 as effected by the Ambassadors' Conference. It has been estimated that upward of 500,000 Albanians were separated from their homeland and apportioned among Serbia, Montenegro, and Greece. The choice of William of Wied, a German prince, as Mpret of Albania, was also a cause of much local discontent. He arrived at Durazzo, Mar. 7, 1914; stayed under the shadow of the Austrian guns in the harbor during his brief reign of six months, and fled the country for Germany on the outbreak of the War. Once more Albania was left without a unified control and at the mercy of the greater states that surrounded it. Local chieftains dominated the scene until the conclusion of the War, though they were helpless in the face of the invading armies. For although it was neutral, Albania was a theatre of war during 1914-18. Austrian armies took possession of northern and central Albania; Italy was established at the Harbor of Valona from November, 1916, on; the Serbs encroached on the northern frontier and the Greeks, on the southern. By the secret Treaty of London (April, 1915), Albania had been disposed of rather baldly as part of the bargain for Italian support. The Allies in this convention recognized the Italian claim to Valona, while Italy on her side promised not to resist the possible desire of France, Great Britain, and Russia to distribute among Montenegro, Serbia, and Greece the northern and southern parts of Albania. It was, therefore, to protect her rights that Italy in June, 1917, announced a virtual protectorate over the country and proceeded to occupy the whole of it when the Allied drive, in the autumn of 1918, banished the Austrians. Within the same year, matters were further complicated by the establishment of a republic under French protection in the neighborhood of Koritza, the presence of an Allied force at Scutari, and the threatening movements of the Serbs on the north and west.

Throughout 1919 the Italians stayed on. Against the protests of Albanian leaders, Italy persisted in a policy of Italianization in the South, sending colonists and gaining control of the schools. The refusal of President Wilson at the Peace Conference to countenance either partition or the establishment of an Italian mandate prevented the submergence of the harassed country. Thus protected, Albanian resistance strengthened. In January, 1920, an assembly at Lushnja protested against partition and elected a regency council, thereby creating a provisional government strongly nationalistic in tone. The regency council of four, sitting at Tirana, was composed of a representative each of the Roman Catholic, Greek Orthodox, and the two Moslem sects, the Sunni and the Bektashi. Finally, in the middle of the year, desultory warfare began between Albanians and Italians which manifested itself first in uprisings in the coast towns and then in fighting inland. Italians were even besieged at Valona in June. The Italian adventure had proved futile, with the result that Giolitti, for Italy, signed a convention on August 2 which guaranteed the evacuation of the country and the surrender of Valona, too, except for the island of Saseno at the entrance to Valona Bay. The French had, meanwhile, left Koritza in the same year.



There seemed at last a hope for a peaceful political development when, on Dec. 17, 1920, Albania applied and was admitted to the League of Nations, although it was plain that such admittance did not connote sovereignty on the basis of the frontiers of 1913. Throughout 1921 Albania made unavailing pleas to the League Council for intervention against the Greeks, who, in 1920, had occupied a district northeast of Koritza containing 26 villages and were claiming the territory, which contained a large Greek population, because of cultural sympathy and economic necessity.

In the autumn of 1921, the Jugo-Slavs made threatening military preparations on the north, and Premier Lloyd George of Great Britain, fearing a Balkan flare-up, demanded a consideration of the whole Albanian question by the Council of Ambassadors, Great Britain recognizing Albania's *de jure* independence on November 7. The Council announced its decision, dated November 9, which practically confirmed the 1913 boundary lines with minor modifications in favor of Jugo-Slavia and Greece. Albania's independence as a sovereign state was recognized, but Italy's special interest was also recognized in a highly important pronouncement which provided that, when Albania should find it impossible to maintain intact her territorial integrity and should appeal to the League Council for assistance, the powers would recommend that the restoration of her frontiers should be entrusted to Italy. Boundary commissions were appointed to delimit the frontiers. On Aug. 25, 1923, the head of the Southern Boundary Commission, General Tellini, was murdered at Janina, Greece. See GREECE and ITALY.

In internal affairs, executive authority remained until 1925 in the hands of the Regency Cabinet, aided by the indirectly elected Parliament of 72 members and a Council of eight ministers responsible to the Parliament. In 1922 the Albanian Greek Orthodox Church asserted its independence, and, in the next year, Albanian Moslems approved of the abolition of both polygamy and the veil for women. From Dec. 22, 1921, the country was governed by a coalition of representatives of its various interests. In December, 1922, Ahmed Zogu became prime minister and, during the next year, the country was relatively quiet. Steps were taken to advance education, and a financial adviser was appointed by the League of Nations.

On July 28, 1922, the United States recognized the government after a special commissioner had visited the country and effected an exchange of notes whereby Albania recognized the American naturalization of former Albanian subjects and accorded to American commerce in customs matters most-favored-nation treatment. Ulysses Grant Smith, the first American Minister, presented his credentials Dec. 4, 1922. He was followed in 1925 by Charles C. Hart. Early in 1924 the latent opposition to Ahmed Zogu became pronounced, culminating in June in a revolt which forced him and his adherents to flee the country. The new government was headed by Fan Noli, Bishop of the Orthodox Church, who had spent several years in the United States and was a graduate of Harvard University. He advocated certain agrarian and financial reforms and was supported by Italy. But before he could place his government on a firm foundation, he was faced with a counter-

revolt organized by Ahmed Zogu, on Jugo-Slav soil, over the protest of the new Government to the League of Nations. In December, the insurrectionists entered the capital, Tirana, and Fan Noli and his followers fled to Italy.

Ahmed Zogu, who now dominated the country, proclaimed a Republic on Jan. 22, 1925, and had himself chosen as President for a term of seven years. He replaced the existing Albanian Army with forces loyal to himself, and put a new constitution into effect. Although the new government was anything but secure and was obliged to make free use of exile measures against its enemies, it proceeded with plans for internal development. It granted to the Anglo-Persian Oil Company concessions to exploit certain territory for petroleum and this action, after some international discussion, led to subsequent concessions to other foreign oil companies. Boundary disputes were settled through the grant to Jugo-Slavia of Sveti Naum in 1925 and by the signing of two protocols, on July 31, 1926, by representatives of Albania, Great Britain, France, Italy, Japan, Greece, and Jugo-Slavia. These protocols related to the Albanian-Greek and Albanian-Jugo-Slav frontiers and were the outgrowth of the work of a boundary commission appointed in 1921 after the country had been admitted to the League of Nations. The opposition to Ahmed Zogu by Fan Noli and his followers in Jugo-Slavia and Italy was continuous and the new government was anything but secure. In November, 1926, a revolt broke out among the Malissors, North and east of Scutari, but was soon suppressed. Trade agreements were signed in 1926 with Great Britain, Germany, Bulgaria, and Czechoslovakia, and a commercial, consular, and extradition convention was signed with Serbia.

In its relations with its neighbors, Albania, under Ahmed Zogu's administration, for a while preserved a certain harmony, the chief discordant note being its protest, in December, 1925, to the League of Nations against the deportation as Turks of 50,000 Albanians from Greece into Turkey. But Ahmed Zogu had been at the head of the state less than a year before it became apparent that he was definitely altering, in favor of Italy, the balance in Albanian affairs which had been maintained between that country and Jugo-Slavia. In September, 1925, Italian initiative established an Albanian National Bank with a capital of 12,500,000 gold francs which Italy controlled from the start. Italian penetration was still further advanced through the creation of the "Svea" (*Società per il sviluppo economico dell'Albania*), an organization through which Albania was to be developed by the building of roads and railways and by harbor improvements. It was charged by the Jugo-Slavs that these works were designed and prosecuted with an eye more to Italian military advantage than to Albania's convenience. The money for this work came from an Italian loan of 50,000,000 gold francs to Albania, and when the latter country was unable to meet the first installments, Italy agreed to guarantee service for a few years.

Basing her action on the decision of the Council of Ambassadors in 1921, Italy, in July, 1926, proposed that she should receive rights of intervention and special privileges in Albania. On Nov. 27, 1926, the Pact of Tirana was signed by the two countries. Its chief pro-

vision was that "Albania and Italy recognize and accept the principle that any action directed against the political, juridical, and territorial status quo of Albania is contrary to their mutual political interests," and each country agreed to form no political or military agreements with other powers prejudicial to their mutual interests. It was to run for five years and was renewable. It aroused a storm of excited protest in Jugo-Slavia and focused the alert attention of all Europe upon Italo-Albanian-Jugo-Slav relations. The premier of Jugo-Slavia resigned because of the failure of his policy of maintaining a cordial understanding with Italy regarding Albania.

In March, 1927, Italy charged that Jugo-Slavia was making military preparations which threatened Albania's independence but, on the suggestion of Great Britain and France, Mussolini took the matter up in direct conversations with the Jugo-Slav Minister at Rome and no more was heard of it. Relations between Jugo-Slavia and Albania became increasingly strained until in June, 1927, when an employee of the Jugo-Slav legation at Durazzo was arrested for espionage, the tension reached the breaking point. Diplomatic relations were severed, and were resumed only after the efforts of European powers effected an adjustment of the immediate incident. To offset the Italian advance, Jugo-Slavia sought eagerly for an alliance with another power. She finally reverted to a long-standing proposal of France for a tripartite agreement between that country, Jugo-Slavia, and Italy, which Italy had refused, and on November 11 Jugo-Slavia signed a treaty of accord with France. Immediately (November 22) Italy and Albania announced a further pact, to run for twenty years, providing for military coöperation between the two countries. Throughout 1927 internal improvements proceeded steadily under Italian direction. A national army officered by Italians, together with a gendarmerie, replaced the former feudal militia. It was largely increased in the following year. The question of the deportation of Albanians by Greece and the seizure of their property continued to cause much friction. On Sept. 1, 1928, Ahmed Zogu assumed the title of Zogu I, King of the Albanians, the constitution being altered to transform the Republic into a Monarchy. He was immediately recognized as King by Italy and later by other powers of the world. The assumption of the throne was bitterly opposed by King Zogu's enemies within and without the state.

**ALBANY.** The capital of New York State. The population increased from 100,253 in 1910 to 113,344 in 1920, and to 120,400 in 1928, by estimate of the Bureau of the Census. A zoning plan, mapped out by the city commission, has been adopted, and industries and individuals are working harmoniously to carry out this plan. In the past few years, the city itself has spent millions of dollars on public improvements. A large portion of this amount was expended in improving the river front along the Hudson River, with the result that Albany is said to have one of the most attractive entrances of any American city. The land for several blocks between Broadway and the Hudson River, together with docks and wharfage rights, was bought by the city for a public park. In 1919 the privately owned Hudson Bridge, which carried the main thoroughfare between Boston and New

York, was bought by the State; tolls were discontinued and the roadway leading up to the bridge was widened and paved, and the sharp blind turn into Broadway made easier. Many improvements also were made on the parks, especially Lincoln Park, and important street improvements were effected. In 1927, \$10,000,000 was appropriated by the Legislature to erect a new State Office Building to house all the State offices scattered throughout the city.

Transportation facilities in Albany are exceptionally good by air, land, and water. The Hudson River is being deepened to a channel depth of 27 feet to accommodate ocean-going vessels, thus making Albany equivalent to a seaport. In anticipation of this development, the Albany Port District Commission is constructing docks, grain elevators, terminals, and warehouses. The first municipal aviation field in the United States was established at Albany; it is called the Quentin Roosevelt Memorial Field. Albany has 223 industries, employing nearly 10,000 persons and paying \$12,383,000 in wages. Among the well-known products manufactured are car wheels, automobile accessories, clay products, printing, meat packing, plate glass, food products, cigars and tobacco, iron and brass foundry products, gas meters, and absorbent cotton. The value of these products in 1928 was estimated at \$52,178,000. Albany is one of the recognized banking centres of the East. It has five banks of discount, including two trust companies, and seven savings banks whose combined capital, surplus, and undivided profits amount to \$14,788,028. The assessed valuation of property in Albany in 1927 was \$209,378,000; the net debt was \$16,402,000.

**ALBEE, FRED HOUDLETT** (1876- ). An American orthopaedic surgeon, born in Alna, Me., and educated at Bowdoin College (A.B. 1899) and Harvard University (M.D., 1903). He also traveled and studied in Europe. He became professor of orthopaedic surgery at the New York Post-Graduate Medical School and director of the department of orthopaedic surgery and held the same posts at the College of Medicine of the University of Vermont. He was surgeon to the New York Post-Graduate Hospital and at one time consulting surgeon to ten hospitals and the Pennsylvania Railroad system. He is widely known for his so-called bone-inlay grafting operation for tuberculosis of the spine (Pott's disease), first described by him in 1912. He demonstrated his original surgical methods of bone grafting in Germany, France, and England in 1914, and two years later in France he was the first to use motor-driven tools in bone surgery, in military practice. In 1917 after the entrance of the United States into the World War, he was commissioned as colonel in the Medical Reserve Corps, and he became director of the United States Army General Hospital No. 3, and member of the advisory orthopaedic council to the surgeon general. He was the official representative of the Army Medical Corps to the Inter-Allied Congress held in Rome, Paris, and Bologna in 1919; delivered the opening address at the Surgical Congress held in Paris, 1922, represented the United States at the Netherland Orthopaedic Congress, Amsterdam, 1923, and was the honorary president of the International Congress on Industrial Accidents and Disease, Amsterdam, 1925. He wrote: *Bone Graft Surgery* (1915) and a large treatise, *Orthopaedic*

and *Reconstructional Surgery* (1919), besides many pamphlets.

**ALBERS-SCHÖNBERG**, älb'ers-shën'bërk, HEINRICH ERNST (1865-1921). A prominent German röntgenologist, born in Hamburg, where he practiced after graduation (M.D.) at Leipzig in 1891. His original bent was toward gynecology, but on Röntgen's discovery, he at once opened an X-ray laboratory, one of the first on record, and by 1897 had founded the periodical *Fortschritte an der Gebiet der Röntgenstrahlen*, followed in 1900 by *Archiv und Atlas der Normalischen und Pathologischen Anatomie in Typischen Röntgenbilde*. In 1903 appeared his textbook *Die Röntgen Technik* (5th ed., 1919). About 1902 he was appointed röntgenologist to the St. Georg Hospital, Hamburg, and a famous X-ray establishment was created in association with it. When the new University of Hamburg was established in 1919, he was appointed a professor of röntgenology, the first of the kind in Germany. He was a cofounder of the German Röntgenological Society. As a pioneer, he made many discoveries not only in the physiology of the X-ray but in technical improvements of the apparatus, including the means of self-protection. He discovered the pernicious action of the rays on the genital glands. He was one of the first to develop X-ray cancer as a result of exposure. Through the removal of the arm by amputation, he managed to survive through many years of usefulness. He also wrote over 150 articles for periodicals. Among his minor works is a monograph on X-ray cancer (*Das Röntgencarcinom*).

**ALBERT, DUKE OF WÜRTTEMBERG** (1865- ). A German general, born at Vienna. He was appointed general in command of the Württemberg Army in 1908, and in 1913 he was appointed inspector general of the 6th Army Inspection. He led the 4th Army on the western front at the beginning of the World War and in 1916 was made field marshal general. He became chief-in-command at the front in Alsace-Lorraine, where he remained till the end of the War. See *WAR IN EUROPE, Western Front*.

**ALBERT I** (1876- ). King of the Belgians (see VOL. I). Following the invasion of Belgium by the Germans in 1914, he joined his troops and remained at the front throughout the World War. Queen Elizabeth remained near him, acting as a nurse in the Hôpital de l'Océan at La Panne. In July, 1926, when the currency situation seemed desperate, the Chamber of Deputies gave him the power to issue royal edicts, after consulting the Council of Ministers, on all financial matters, thus making him a virtual dictator for six months. In the summer of 1928, he and the Queen made a trip to the Belgian Congo. There is an official biography by Evelyn Graham, *Albert, King of the Belgians* (New York, 1929).

**ALBERT, EUGEN D'** (1864- ). A German pianist and composer (see VOL. I). He added to his list of operas: *Die toten Augen* (Dresden, 1916; Chicago, 1923), *Der Stier von Olivera* (Leipzig, 1918), *Revolutionshochzeit* (Leipzig, 1919), *Sirocco* (Darmstadt, 1921), *Mareike von Nymwegen* (Hamburg, 1923), *Der Golem* (Frankfort, 1926).

**ALBERTA**, ä'l-bûr'tä. A province in western Canada with an area of 255,285 square miles and a population in 1921 of 588,454, representing a gain of 214,159, or 57.2 per cent since the 1911 census. The rural population in 1921 was 62 per cent of the whole, as compared with 75

per cent in 1901. As in the other prairie provinces, males continued in excess of females, the division in 1921 being 324,208 males and 264,246 females. The estimated population in 1929 was 646,000. The leading cities with their populations in 1926 were Calgary, 65,513; Edmonton, 65,163; Lethbridge, 10,893, and Medicine Hat, 9536. Immigrants from the United States steadily increased in number, so that the census of 1916 recorded 91,000 settlers of American origin in Alberta.

**Industry.** Under the impetus of vast irrigation projects, Alberta was rapidly converted into an agricultural country, so that by 1928 at least 16 per cent of the 60,000,000 acres of arable land in the province were under crops. The result of irrigation activity manifested itself in the appearance of a more diversified husbandry and a greater attention to root crops and alfalfa. However, the prairie country accounted for the importance of wheat. Of the 9,777,816 acres sown in 1928, 6,707,526 were under wheat. Next in importance were oats, barley, hay and clover, and rye. That the livestock industry did not decline, in spite of the inroads of the farmers, may be seen from the following: Cattle in 1912 and 1928, 745,299 and 1,299,495; sheep, 135,075 and 515,000; swine, 278,747 and 680,000. In 1926-27 there were 1078 grain elevators with a capacity of 40,983,000 bushels. In 1921, there were 83,431 farmers in the province. Minerals made up the second source of economic wealth. The vast coal area which covers almost the entire province accounted for 95 per cent of the annual output of all the prairie provinces. In 1926 the output was 6,508,908 tons. Other mineral products included cement, natural gas, sand and gravel, bitumen, gold, and salt. The total mineral production was \$26,681,641 in 1926, an increase of \$15,500,000 over the 1912 output. Local manufactures in 1924 showed 739 industrial establishments; capital, \$67,565,979; number of employees, 8150; salaries and wages, \$10,709,140; cost of materials, \$39,102,975; value of products, \$65,245,361. The leading industries are flour-mills and gristmills, door and planing mills, slaughtering and meat packing. Lumbering and fishing are also important activities.

**Trade and Communications.** The articles entering principally into the interprovincial trade are grain, live stock, hams, wool, eggs, fish, butter, mining, and timber products. During the year ending Mar. 31, 1920, imports for consumption of the Province of Alberta were valued at \$3,855,059; the Canadian exports amounted to \$51,910, and the foreign exports to \$2396. In 1926 there were 5061 miles of railway in the province, as compared with 2545 miles in 1914. In 1929 the province transferred to the Canadian Pacific Railway and the Canadian National Railways the Edmonton, Dunvegan & British Columbia Railway, the Central Canada Railway, the Alberta Great Waterways Railway, and the Pembina Valley Railway. These lines were to be merged under one system to be known as the Northern Alberta Railways. The telephone system owned by the provincial government had 187,584 miles of wire in 1926. Throughout the province, 57,250 telephones were in use.

**Government.** The province's representation in the Canadian Parliament is six in the Senate and 12 in the House of Commons. Revenues for 1926 were \$11,912,128, against \$5,399,905

in 1913; and expenditures, \$11,894,327, against \$5,275,584 in 1913. The public debt in 1926 amounted to \$80,894,665. Education made steady advances. The 150,526 pupils enrolled in 1926 were more than double the number of pupils of 1912. The University of Alberta had 1350 students in attendance in 1926. Total expenditures for education in 1912 were \$6,667,282; in 1926, \$9,556,877. Women have the franchise. On Mar. 31, 1929, there was a surplus of \$1,817,871 in the Treasury.

**ALBRIGHT, HORACE MARDEN** (1890- ). An American National Park official. He was born at Bishop, Calif., and graduated at the University of California (1912), where he served for one year as assistant instructor in economics. In 1914-17 while clerk to Franklin K. Lane, then Secretary of the Interior, he studied law and was admitted to the District of Columbia bar. He was assistant attorney of the Interior Department, assigned to National Park affairs in 1917, and assistant director of the National Park Service at Washington in 1917-18. From 1919 to 1929, he was field assistant in the Park Service and superintendent of the Yellowstone National Park. He also was temporarily in charge of the Yosemite National Park (1927-29). In 1929 he was named as director of the National Park Service to succeed Stephen T. Mather.

**ALCHEMY, MODERN.** See **PHYSICS**.

**ALCOCK, SIR JOHN** (1892-1919). A British aviator born at Manchester. He was instructor of flying at Eastchurch at the outbreak of the World War and was afterward chief instructor with the aeronautic squadron. He served with distinction on the Turkish front and in 1917 was taken a prisoner by the Turks. In 1919 he won the prize offered by the London *Daily Mail* for the first successful flight across the Atlantic, with Lieut. A. W. Brown. Both men were knighted for this achievement. Alcock was killed at Côte d'Evrard, north of Rouen, in France, by the crashing of his airplane.

**ALCOHOL.** See **CHEMISTRY, APPLIED**.

**ALDA, FRANCES** (1883- ). An American dramatic soprano (see **VOL. I**). In 1928 she was divorced from Giulio Gatti-Casazza, but the divorce did not affect in any way her relations as an artist of the Metropolitan Opera House.

**ALDEN, CARLOS COOLIDGE** (1866- ). An American lawyer and educator, born at Wilmington, Ill. He received his law degrees at New York University and in 1893 was admitted to the bar. He practiced in New York from 1893 to 1904 and was associate professor of law in New York University, 1896-8; professor, 1898-1904. In 1904 he became dean of the Buffalo Law School. He was legal adviser to Governor Hughes in 1909 and in the next year became New York State Commissioner on Uniform State Laws. He is the editor of *A Handbook of the Code of Civil Procedure* (1901) the second edition of *Abbott's Practice and Forms* (1907), the second edition of *Abbott's Forms of Pleading* (1918), and *Handbook of Civil Practice* (1921).

**ALDEN, RAYMOND MACDONALD** (1873-1924). An American educator and author (see **VOL. I**). From 1914 until his death, he was professor of English at Stanford University. His later works include *Tennyson, How to Know Him* (1917); *Shakespeare (in Master Spirits of Literature Series)* (1921); *The Boy Who Found the King* (1922). He edited: *Readings in English*

*Prose* (1911 and 1917); *Sonnets of Shakespeare* (1913; variorum edition, 1916); *Essays, English and American* (1918); *Critical Essays of the Nineteenth Century* (1921); *Poems of the English Race* (1921).

**ALDERSON, VICTOR CLIFTON** (1862- ). An American educator and mining engineer, born at Plymouth, Mass., and graduated from Harvard University, 1885. After teaching in Middle Western high schools, 1885-93, he became successively professor of mathematics (1893-98), dean (1898-1900), acting president (1900-01), and dean (1901-03) of the Armour Institute of Technology, Chicago. He was president of the Colorado School of Mines from 1903 to 1913 and 1917-25. Between 1913 and 1917, he was president (1913-15) of the Winnemucca (Nev.) Mountain Mining Company and consulting engineer (1915-17). After relinquishing the presidency of the Colorado School of Mines, he became again a consulting mining engineer, specializing in oil shale. He is a member of the American Institute of Mining and Metallurgical Engineers, the Institute of Petroleum and Technologists, of London, and other societies of scientists. He wrote: *The Oil Shale Industry* (New York, 1920) and *Oil Shale; a Résumé for 1921* (Golden, Colo., 1923).

**ALDIN, CECIL CHARLES WINDSOR** (1870- ). An English illustrator (see **VOL. I**) whose later published work includes: *Old Inns* (1919-20); *Old Manor Houses* (1924) and plates on hunting.

**ALDINGTON, HILDA DOOLITTLE** ("H. D.") (1886- ). An American poet, born at Bethlehem, Penn. She entered Bryn Mawr College in 1904 and later went abroad. Her poetry placed her among the most important of the Imagists. Her works, which have appeared in many periodicals, are distinctly Hellenic in their delicacy and cold beauty. Her publications include *Oread*; *Pear Tree*; *Heat*; and *Lethe*.

**ALDRICH, CHESTER HOLMES** (1871- ). An American architect, born at Providence, R. I., and educated at Columbia University and the École des Beaux Arts, Paris. He has practiced his profession since 1902 in New York, as a member of the firm of Delano & Aldrich, designers of many well-known public buildings and private residences. Among the former are the Knickerbocker and the Colony Club buildings in New York, the Walters Art Gallery in Baltimore, Md., and Sage Hall at Yale University. From 1917 to 1919 he was director general of Civil Affairs of the American Red Cross Commission to Italy, and received various Italian decorations.

**ALDRICH, MORTON ARNOLD** (1874- ). An American educator, born at Boston, Mass. After graduation from Harvard University in 1895, he was a student at the universities of Berlin, Munich, and Halle. He became successively instructor in economics at Harvard, assistant professor at Stanford University, and associate professor and professor of economics and sociology at Tulane University. Since 1914 he has been dean of the college of commerce and business administration of Tulane University. Professor Aldrich has devoted himself to the practical application of economic theories to the needs of business administration.

**ALDRICH, RICHARD** (1863- ). An American writer on music (see **VOL. I**). He resigned his position as musical editor of the *New York Times* in 1925. He was the chief con-

tributor on American topics for the third edition of Grove's *Dictionary of Music and Musicians* (1927-28). A collection of essays published originally in the *Times* he issued in book-form under the title *Musical Discourse* (1928).

**ALESSANDRI, ARTURO** (1869- ). A Chilean statesman who was educated in Catholic schools and studied law at the University of Chile. At 24 he was a successful lawyer, and in 1898 was elected to the Chamber of Deputies by the Liberals. Later, he became a minister of state, holding, among others, the portfolios of industry and public works, and at one time being chief of the cabinet. On Dec. 23, 1920, he took office as President of the Chilean Republic, committed to reforms which caused a conflict with the conservative Senate in 1923. The elections of March, 1924, backed the President, but business and financial conditions seemed hopeless, and on September 9 he offered his resignation, which the Senate refused to accept, granting him instead six months' leave of absence. He went abroad, and the Government was under military control until his return on Mar. 20, 1925. An assembly to reform the constitution was called, the country became stabilized, and elections based on the new constitution were called for October 24. Alessandri resigned the presidency on October 1 because Colonel Ibáñez, the War Minister, refused to join the rest of the cabinet in resigning in the interest of free elections. In 1926 Alessandri came to the United States for discussions of the Tacna Arica dispute, and in 1927, when Ibáñez became president, he was exiled. See CHILE, *History*.

**ALEXANDER, KING OF THE HELLENES** (1893-1920). The second son of King Constantine and Queen Sophia, sister of the ex-Kaiser of Germany. He ascended the throne of Greece on June 12, 1917, after the Allies, believing him more sympathetic to their cause than his elder brother, forced King Constantine to abdicate in his favor. His original attitude of active personal interest in his subjects and kingdom immediately won for him the loyalty of his people. The diplomatic triumphs of Venizelos, Liberalist leader, at the Peace Conference, met serious reverses with the sudden death of Alexander on Oct. 25, 1920, by blood-poisoning from the bite of a pet monkey.

**ALEXANDER I** (1888- ). King of the Serbs, Croats, and Slovenes. The second son of Prince Peter Karadjorgjevic, later King of Serbia, was educated at St. Petersburg, entered (1904) the *corps des pages* at the Czar's court, and was formally recognized as crown prince in 1909. On the outbreak of the Balkan War, he had nominal command of the First Army. Because of the ill health of King Peter, he was made prince regent on June 24, 1914, and was therefore commander-in-chief of the Serbian Army when the World War started. The Prince personally became very popular with his soldiers, whose privations and hardships he shared throughout the War, with the exception of two months in 1916 when he visited Paris and London and made the first official references to "the Jugo-Slav people." On Dec. 1, 1918, he was formally recognized as regent in all the Jugo-Slav provinces by delegates of the Jugo-Slav National Council in Zagreb. In August, 1921, after an attack on his life in June, he succeeded his father as King of Jugo-Slavia. Because of the great number of races, religions, and customs, a large degree of local authority was desirable,

but the need of centralization, in order to provide adequate defense, triumphed, resulting in widespread discontent causing frequent changes of ministry, particularly after the death of Pashitch. On Jan. 6, 1929, when the situation was growing worse, King Alexander proclaimed himself dictator, ruling through a ministry responsible only to him.

**ALEXANDER, ALBERT V.** (1885- ). A British public official, born at Weston-super-Mare. He was made secretary of the Parliamentary committee of the Coöperative Congress in November, 1920. Two years later, he was elected to the House of Commons by the Labor party of the Hillsborough division of Sheffield, and was returned in each successive election. During the premiership of J. Ramsay MacDonald, from January to November, 1924, he served as secretary of the Board of Trade, and after MacDonald again came into power, in May, 1929, Alexander joined the Labor Cabinet as Lord of the Admiralty. For a number of years he was a Baptist lay preacher.

**ALEXANDER, CARTER** (1881- ). An American educator, born in Paris, Mo., and educated at the University of Missouri and Columbia University. He held various positions as teacher and as superintendent of schools in Missouri from 1898 to 1908. From 1908 to 1910, he was research scholar and later fellow in education at Columbia University. He was assistant professor of educational administration at the University of Missouri (1910-13), taught successively in the summer schools of Columbia and Chicago universities, and from 1913 to 1918 was professor of school administration and chairman of the committee on graduate work at the George Peabody College for Teachers at Nashville, Tenn. He was first assistant to the State Superintendent of Public Instruction of Wisconsin (1918-21) and from 1921 to 1924 was assistant director of the Educational Finance Inquiry in New York. He was staff specialist on finance and administration for the Philippine school survey (1925); research associate of the institute of educational research, division of field studies, Teachers College, Columbia University, after 1924, and associate professor of education at Teachers College after 1925. Besides contributing to periodicals, he published: *Some Present Tendencies of Teachers' Voluntary Associations* (1910); *School Statistics and Publicity* (1919); (with W. W. Theisen) *Publicity Campaigns for Better School Support* (1921); *Bibliography of Educational Finance* (1924).

**ALEXANDER, HARTLEY BURE** (1875- ). An American educator, professor of philosophy at the University of Nebraska (see Vol. I). During the World War, he represented the ultra-pragmatic wing of American philosophy and sought to apply philosophizing to the everyday problems of war and peace. *Liberty and Democracy* (1918) is a collection of such contemporary essays. *Letters to Teachers* (1919) is an appeal to educators to forego the academic routine. Among his other later works are *The Mystery of Life* (1913); vol. x in the series, *Mythology of All Nations*, treating of North American mythology (1916), and vol. xi, treating of Latin American mythology (1920); *Odes and Lyrics* (1922); *Nature and Human Nature* (1923); *Manito Masks* (1925); *L'Art et la Philosophie des Indiens de l'Amérique du Nord* (1925); and *God's Drum* (1927). He contrib-



uted to the *Encyclopædia of Religion and Ethics* (1925). Professor Alexander lectured at the Sorbonne, Paris, in 1925. In 1919 he was president of the American Philosophical Association.

**ALEXANDER, MAITLAND** (1867- ). An American clergyman, born in New York City and educated at Princeton University, McCormick Theological Seminary in Chicago, and Princeton Theological Seminary. He was ordained in the Presbyterian ministry in 1892 and held pastorates in New Jersey and New York (1893 to 1899). He accepted a pastorate in Pittsburgh in 1899, and in 1916 was moderator of the Presbyterian General Assembly. He received the degree of D.D. from Lafayette College in 1897.

**ALEXANDER, ROBERT** (1863- ). An American army officer, born in Maryland. He enlisted in the United States Army as a private in 1886 and received a commission as second lieutenant in 1889. He advanced through the grades (he was graduated from the Army Staff College in 1910), and reached that of colonel in 1917, after service in the Spanish-American War, the Philippines, Cuba, and Mexico. He went to France in 1917 as inspector general, line of communications, was commander of the 41st (1st Depot) Division in 1918, of the 63d brigade, 32d Division, also in 1918, and of the 77th Division from August, 1918, to May, 1919. In this capacity, he took part in the Oise-Aisne, Argonne-Meuse, and Marne-Aisne operations. He was made a brigadier general Apr. 30, 1921, and on Aug. 4, 1921, was appointed commander of the 3d F. A. Brigade. He was decorated with the Distinguished Service Cross of the United States, the Croix de Guerre (two citations) of France, and was made a commander of the Legion of Honor of France. On Aug. 26, 1927, he was raised to the rank of major general. He retired Oct. 17, 1927.

**ALEXANDER, SAMUEL** (1859- ). An English philosopher and educator (see VOL. I). With the publication of his Gifford Lectures, *Space, Time and Deity*, in two volumes (1920), he joined the ranks of the leading English philosophers. His work was hailed in many quarters as combining the sweep of the great German metaphysicians with the critical insight characteristic of the British tradition. From his point of view as a realist, Professor Alexander constructs a genuine ontological metaphysics. Space-time is his ultimate reality, and he regards the entire universe as a hierarchy of complexes of this primitive matter; new qualities evolve out of the lower complexes; it is thus that life, sensation, and mind come into being; and universals are patterns which are repeated at various places in the scale of evolution. His conception of God is quite original. "God as actually possessing deity does not exist but as an ideal, is always becoming; but God as the whole Universe tending toward deity does exist." Unlike the American neo-realists, Professor Alexander is opposed to behaviorism in psychology. He regards mind as a new quality and not as the neutral cross-section imagined by Prof. E. B. Holt. Professor Alexander was made Honorable Fellow of Lincoln College, Oxford, in 1918. In 1924 he retired from the faculty of Victoria University, Manchester, and in 1927 became Herbert Spencer Lecturer at Oxford. His more recent works

include a number of articles on mind, discussions at the Aristotelian Society, *Space, Time and Deity* (Gifford Lectures, 1920), and a lecture on *Spinoza and Time* (1921). For a critical consideration, see PHILOSOPHY.

**ALEXANDER, WALLACE MCKINNEY** (1869- ). An American sugar manufacturer, born on the Island of Maui (H. I.), where he has extensive sugar plantations and refineries. He was graduated from Yale University, 1892. He was appointed chairman of the commission from San Francisco visiting Japan (1920), chairman of the Japanese Relations Committee of California, and president of the San Francisco Chamber of Commerce (1921-22). He has been president of Alexander & Baldwin, Ltd.; vice-president of the Matson Navigation Company, of the Hawaiian Commercial and Sugar Company, Ltd.; and of the Honolulu Consolidated Oil Company of California and director of the California and Hawaiian Sugar Refining Company, the Pacific Gas and Electric Company and the Columbia Steel Corporation.

**ALEXEYEV, MIKAIL** (1857-1918). A Russian general who entered the army in 1876 and completed his course at the General Staff College in 1890. He took part in the war with Turkey and the Russo-Japanese War, becoming a general in 1904. At the outbreak of the World War, he was chief of staff on the southwestern front, and credit for the Russian victory in Galicia was given to him. In 1915 he was commander on the northwestern front until August, when he became chief of the general staff of the Emperor. A breakdown in health compelled him to resign in November, 1916. After the revolution of March, 1917, he was commander-in-chief but was dismissed in July, Kerensky recalling him in September to quell the Kornilov revolt. Not wishing to work with Kerensky or Kornilov, he retired, and at the beginning of the Bolshevik rule fought against it in South Russia. He died of heart disease.

**ALEY, ROBERT JUDSON** (1863- ). An American educator (see VOL. I). After acting as president of the University of Maine (1910-1921), he became the president of Butler University, Indianapolis, Ind. He was a trustee of the National Education Association, 1911-17, and president, 1916-17; secretary of the National Council of Education, 1911-13, and president, 1913-17; a fellow of the American Association for the Advancement of Science and of the Indiana Academy of Science, and a member of the American Mathematical Society and the Mathematical Association of America.

**ALFALFA LEAF WEEVIL**. See ENTOMOLOGY, ECONOMIC.

**ALFANO, FRANCO** (1877- ). An Italian operatic composer, born at Posilipo, near Naples. After completing the course at the Naples Conservatory, under De Nardis and Serrao, he went to Leipzig for further study with Jadassohn. In 1896 he wrote his first opera, *Miranda*, which was never produced, and published his first compositions for piano. The performance of his second opera, *An den Quellen von Enschr* (Breslau, 1898) did not bring him the success he had expected and he then went to Paris, where he tried his fortune at the Folies-Bergères with two ballets, *Napoli* and *Lorenza* (both in 1901). Disappointed, he returned to his native country and began work on *Risurrezione*, after the novel of Tolstoy, which aroused tremendous enthusi-

asm at its première in Turin (1904). Soon this work was heard with equal success at La Scala in Milan, and then made its way outside of Italy to Brussels, Berlin, and Paris. In 1925 it had its American première at Chicago. From 1919-25 Alfano was professor of composition at the Liceo Rossini in Bologna, whence he went to Turin as director of the Liceo Giuseppe Verdi. After the death of Puccini, he completed the latter's unfinished *Turandot* (Milan, 1926). Alfano's other operas are *Il Principe Zilah* (Genoa, 1909), *L'ombra di Don Giovanni* (Milan, 1914), *Leggenda di Sakuntala* (Bologna, 1921), *Madonna Imperia* (Turin, 1927; New York, 1928). Besides these operas, he wrote a Symphony in E, two string quartets, and a *Suite romantica* for orchestra.

**ALFONSO XIII** (1886- ). King of Spain (see Vol. I). He made tireless efforts during the World War to assist refugees and to obtain information concerning prisoners and the missing. As a neutral, Spain was in a position to do a service of this sort; but recognizing that it was not a governmental duty, the King carried on the work entirely on his own initiative. He supported Primo de Rivera after the latter established a dictatorship in 1923.

**ALFRED UNIVERSITY.** A coeducational, non-sectarian institution at Alfred, New York; organized as a private school in 1836, and chartered as a university in 1857. The student enrollment increased from 447 in 1912 to 665 in 1927-28, with an additional 138 in the 1928 summer session. The teaching staff in 1928 numbered 50. The endowment funds, buildings, and equipment, aggregated \$1,607,533 in 1928, as compared with a valuation of \$500,000 in 1912. The library during this period increased from 25,000 to 42,000 volumes. The New York State School of Clay Working and Ceramics, and the New York State School of Agriculture at Alfred, are parts of the University organization. President, Boothe Colwell Davis, LL.D.

**ALFVÉN, Hugo** (1872- ). A Swedish composer and conductor, born in Stockholm. After graduating from the Stockholm Conservatory in 1891, he continued to study violin with Zetterquist and composition with Lindegren, then traveled in Germany, France, and Belgium. In 1900 he won the Jenny Lind Stipend for three years, which he spent traveling and studying. Since 1910 he has been professor of music at the University of Upsala, where he organized a chorus, *Orpheidrängar*, which soon became famous through extensive tours of Europe. He has filled many engagements as conductor of important festivals in Scandinavia and Germany. He is recognized as one of the foremost of contemporary Swedish composers. Works: Four symphonies (*F m.*, *D*, *E*, *C m.*); three symphonic poems: *An Island Saga*, *Eulogy* and *Midsummer Watch*; *Upsala Rhapsody* for orchestra; a ballet-pantomime, *The Spirit of the Mountain*; *Sten Sture* for baritone, male chorus and orchestra; and some fine chamber music.

**ALGERIA** (Ar. Al-jazīrah, the island; Fr. Algérie). A French colony and territory in North Africa. Its area is estimated at 847,000 square miles. The population according to the census of 1926 was 6,064,865, of whom the northern division contained 5,522,640, and the southern, 542,225. The population in 1921 was 5,802,464. Of the total population in 1926, Europeans numbered 872,439, against 681,772

in 1911, and the natives 5,192,426, against 4,711,276 in 1911. Frenchmen made up the majority of the European colonists, though it was estimated that Algeria contained 150,000 Spaniards and 40,000 Italians, who were attracted by the liberal land grants offered by the Government. The chief towns reported the following population figures for 1926: Algiers, 226,218; Oran, 150,301; Constantine, 93,733; Bone, 51,895; Tlemcen, 26,758; Sidi-bel Abbès, 43,148; Blida, 24,758; Phillippeville, 20,242; Sétif, 26,677. The native population, consisting of Arabs, Berbers, Kabyles, and Mozabites, is entirely Mussulman. The chief Christian church is the Roman Catholic. Several Protestant churches and Jewish synagogues are supported by government grants.

**Industry and Commerce.** Agriculture is the leading activity of the population. An enlightened government interest contributed to its continuous development. European colonists in particular were encouraged to apply themselves to scientific cultivation. Irrigation was resorted to and the Algerian bureau of agriculture did much to encourage the introduction of rust- and drought-resisting varieties of hard and soft wheat. The centres of production of cereal culture moved further and further south during the period, leaving the coast regions to the cultivation of vineyards, citrus fruits, vegetables, tobacco, etc. The leading cereal crops, wheat, barley, and oats, produced a yield of 1,693,000 metric tons in 1927 as compared with 2,317,000 tons in 1921, and 1,089,840 in 1910. The average annual yield is 2,200,000 tons. Because of the hard wheat produced and the presence of many skilled Italians, the manufacture of macaroni has become important. The manufacture of flour and semolina, too, are of importance. The cultivation of the vine, following cereals in order, yielded an average of 9,746,000 hectoliters during 1922-27. Tobacco planting has shown advances. In 1909-13 the yield averaged about 10,000 tons; in 1927 the planting was 87,024 acres and the yield, 25,550 tons. The growth in the industry is due to the encouragement given by the French Tobacco Monopoly which bought up the major part of the crop. Other products contributing to the wealth of the colony are alfa, or esparto-grass, palm-leaf fibre, fruits, vegetables, lumber, woods, charcoal, etc. Algeria, too, furnished France with one-fourth of its sheep consumption. Minerals, principally iron ore and phosphates, were also important. There were mined in 1927, 2,020,000 metric tons of iron ore (1,432,748 in 1913), 847,000 tons of phosphates (370,934 in 1913), 64,748 tons of zinc (118,884 in 1913), 1800 tons of petroleum (67 in 1913). After the War, efforts were made to develop a greater coal and lignite production, but with only little success. Figures for trade follow: imports for 1913, 1920, and 1928, 667,305,000, 3,072,707,000, and 4,068,146,000 francs, respectively; exports for the same years, 501,169,000, 1,355,372,000, and 3,995,682,000 francs. The balance of trade thus continued unfavorable, but this was largely written off by the income due Algerians on foreign securities and by the expenditures of tourists. Leading exports in 1927 were wine, 1,315,730,000 francs; sheep, 112,450,000; wheat, 108,164,000; tobacco, 67,686,000; and cigarettes, 48,599,000. France, in 1927, took 62.2 per cent of the exports and supplied 73.1 per cent of the imports. On Dec. 31, 1927, there were 2716 miles



of railway, of which more than one-half are State owned. In 1912 there were 2049 miles in all. In 1920 a vast improvement scheme was announced, calling for the development of railways, vehicle roads, ports, schools, colonization, postal, telegraph, and telephone communications, forestation, irrigation, etc., and for this work loans up to 1,600,000,000 francs were authorized by the French Law of July 23, 1921.

**Government and History.** There were no important administrative changes in the colony in recent years, except the extension of French citizenship in 1919 to veterans of the French army or navy, landowners, farmers, licensed traders, those capable of reading and writing French, and possessors of a French decoration. Estimated revenue for 1912 and 1928 was 151,690,315 francs and 997,778,628 francs, respectively; expenditure for 1912 and 1928 was 151,669,255 francs and 997,600,458 francs. In 1912, the direct taxes on natives were suppressed. There was no external debt, and the French government met the expenses of the War and of naval establishments. The colony has remained peaceful and its economic progress proceeded unchecked under the beneficent eye of the French imperial administration. But the European population grew very slowly, under the deterrent influence of the system of land tenure. Colonists found their acquisition of property checked by the faulty titles and the refusal of the natives to sell their land, much of which was held by communities. Again, the onerous conditions imposed upon colonists by the state, i.e., a five years' residence requirement for a complete title, retarded immigration.

**ALIEN ENEMY PROPERTY CUSTODIAN.** See UNITED STATES, under *History*.

**ALKALI EARTH METALS.** See CHEMISTRY.

**ALLEE, WARDER CLYDE (1885- )**. An American zoologist and teacher, born at Bloomington, Ind., and educated at Earlham College and the University of Chicago. After teaching zoology and botany at the Universities of Chicago and Illinois and Williams College (1910-14), he became assistant professor of zoology at Oklahoma University (1914-15); professor of biology at Lake Forest College (1915-21); assistant professor of zoology at the University of Chicago (1921-23), and associate professor in 1923. From 1925 he was dean in the colleges at the university. He was on the teaching staff of the Marine Biological Laboratory at Woods Hole (1911-21), lecturer in zoology at the University of California (1923) and professor of zoology at the National Summer School, Logan, Utah, since 1924. In 1918 Professor Allee became secretary of the American Society of Zoologists and he has held membership in several national societies of scientists. He published (with Marjorie Hill Allee) *Jungle Island* (1925), and has written many papers on environment as related to animal life, and on other subjects connected with animal ecology.

**ALLEGHENY COLLEGE.** A coeducational, non-sectarian college at Meadville, Pa., under the patronage of the Methodist Episcopal Church; founded in 1815. The student enrollment rose from 405 in 1916 to 614 in the autumn of 1928, with an additional 143 in the 1928 summer session, and the faculty membership increased from 27 to 40. The productive funds of the college amounted to \$1,400,000 in 1928, and the income for the year 1927-28 to

\$367,234. The number of volumes in the library increased from 44,000 to 71,000 volumes and numerous improvements were made in the plant of the college. A new gymnasium and an addition to the women's dormitory were constructed during the period 1914-24; Bentley Hall, the original administration building was restored to its colonial architecture in 1925, through the generosity of John B. Ford of Detroit; a new central heating plant was erected at an expense approximating \$150,000, in 1926; and Arter Hall, a recitation building, and Carlisch Memorial Hall, a freshman dormitory for men, were under construction in 1928. President, James A. Beebe, D.D., LL.D.

**ALLEN, BENNET MILLS (1877- )**. An American zoologist and teacher, born at Greencastle, Ind., and educated at De Pauw University and the University of Chicago. He was instructor in anatomy, assistant professor and professor of zoology in the University of Wisconsin (1903-13); professor of zoology at the University of Kansas (1913-22); and associate professor of biology at the University of California, Southern Branch (1922-24); professor since 1924. He has published articles on various subjects in embryology, especially that of the origin and development of germ glands, and he has devoted much attention to the influence of the glands of internal secretion.

**ALLEN, CALVIN FRANCIS (C. FRANK) (1851- )**. An American engineer, born at Roxbury, Mass. He was graduated at the Massachusetts Institute of Technology in 1872. After holding various engineering appointments, chiefly in connection with waterworks and railroads, he studied law, was admitted to the bar in 1885, and practiced in both New Mexico and his native State. He was city attorney of Socorro, N. M., in 1886. Returning in 1887 to engineering, he became successively assistant, associate, and then professor of railroad engineering at the Massachusetts Institute of Technology, until 1916, when he was retired. During the World War, he was household fuel economy agent for Massachusetts. Professor Allen published *Railroad Curves and Earthworks* (1889), *Tables for Earthwork Computation* (1893), *Field and Office Tables* (1903), and *Business Law for Engineers* (1917).

**ALLEN, FLORENCE ELLINWOOD (1884- )**. An American judge, born at Salt Lake City, Utah, and educated at Salt Lake College and Western Reserve University and the law departments of the University of Chicago, and New York University. She began her career as assistant to the Berlin correspondent of the *Musical Courier* (1904-06) and was later music editor of the *Cleveland Plain Dealer* (1906-09) and lecturer on music for the New York City Board of Education (1910-13). She was admitted to the bar and began her law practice at Cleveland, Ohio, in 1914. She became assistant county prosecutor of Cuyahoga County, Ohio (1919-20), and was elected judge of the Court of Common Pleas of Cuyahoga County, Ohio, for the term 1921-26. In 1922 she was elected judge of the Supreme Court of Ohio, for the term 1923-29. She was the first woman in America to hold such an office and the first woman in the world to judge first-degree murder cases. She published *Patris*, a book of poems (Cleveland, 1908).

**ALLEN, FREDERICK JAMES (1864-1927)**. An American vocational director, born at Limerick,

Me., and educated at Dartmouth College and Harvard University. He held teaching positions at Boston University and Simmons College, and subsequently became director of the Young Men's Civic Club of Boston (1904), investigator of occupations for the Vocational Bureau in Boston (1910-17), and director of the Bureau of Vocational Guidance of Harvard University and lecturer in vocational guidance at Boston and Harvard universities. His works include *Vocations for Boys and Young Men* (1911); *The Law as a Vocation* (1913); *Business Employments* (1916); *Advertising as a Vocation* (1918); *The Shipbuilding Industry* (1918), and *A Guide to the Study of Occupations and Studies of Occupations in Agriculture, Forestry and Animal Industry* (1921). He was editor of the *Vocational Guidance Magazine* (1922-27).

**ALLEN, FREDERICK MADISON** (1879- ). An American physician, originator (1914) of the Allen fasting treatment for diabetes, born at Des Moines, Iowa. He received his education at the University of California (A.B., 1902), studied for three years in the medical department of the University of Chicago, and received his M.D. from the University of California (1907). At the Harvard Laboratory of Preventive Medicine and Hygiene, he devoted himself (1909-12) to research in the nature of diabetes. Later (1913-18), he was on the staff of the Rockefeller Institute for Medical Research in New York and in 1919 he founded the Psychiatric Institute at Morristown, N. J. The results of his early laboratory work were published in 1913 in *Studies Concerning Glycosuria and Diabetes*. In 1919, with Drs. E. Stillman and R. Fitz, he published *Total Dietary Restriction in the Treatment of Diabetes*, and in 1925 *Treatment of Kidney Diseases and High Blood Pressure*. In 1922 Dr. Allen established the *Journal of Metabolic Research*, of which he is editor-in-chief.

**ALLEN, HENRY JUSTIN** (1868- ). An American editor, author, United States Senator, and former governor, born in Warren County, Pa., and educated at Baker University and Washburn College, Kan. He began professional life as an editor and subsequently owned several daily newspapers, including the *Daily Beacon* of Wichita, Kan. He was in France with the American Red Cross in 1917 and 1918; in the latter year he organized the "home communication service" of the American Red Cross in France. He is best known for his work as Governor of Kansas (1919-23), when he took an active interest in industrial problems. In 1924 he was special commissioner for the Near East Relief to investigate the work in various countries of Europe and Asia. He was appointed in 1929 to the seat in the Senate vacated by Vice President Charles Curtis, his term to expire in 1930. Washburn College and the University of Denver conferred on Senator Allen the degree of LL.D. He has contributed to magazines articles on political, industrial, and administrative subjects and is author of *The Party of the Third Part* and *The Story of the Kansas Industrial Relations Court* (New York, 1921).

**ALLEN, HENRY TUREMAN** (1859- ). An American army officer, born at Sharpsburg, Ky. He was graduated from the United States Military Academy in 1882, and was commissioned in the Second Cavalry. He was engaged in exploration in Alaska in 1885-86, and later received the medal of the Imperial Russian Geo-

graphical Society. After serving as an instructor at the Military Academy and as a military attaché in Russia and Germany, and studying at Georgetown College (A.M., 1898), he took part in the campaigns in Cuba and the Philippines, and in 1901 was Governor of the Island of Leyte. He organized and was the first chief of the Philippine Constabulary. In 1916, as a colonel, he was with the Mexican expedition, and in 1917 he organized a cavalry brigade at Fort Riley, Kan. When the United States entered the World War in 1917, he was made a brigadier general and assigned to the command of the Ninetieth Division, with which he went to France and took part in the fighting in the Toul sector and the St. Mihiel and Argonne offensives. In 1919 General Allen was assigned to command of the American forces of occupation in Germany. Later, he became chairman of the national executive committee to raise funds for the undernourished children of Germany. He was appointed a major general of the regular army in 1921 and was retired in 1923. He received the American Distinguished Service Medal, and decorations from France, Belgium, Montenegro, Panama, and Italy. Lincoln Memorial University (1915) and Georgetown University (1922) bestowed on him the degree of LL.D. He wrote: *Reconnaissance of the Copper, Tanana and Kuyukuk Rivers* (1886); *The Military System of Sweden* (1895) and *My Rhineland Journey* (1923).

**ALLEN, SIR HUGH PERCY** (1869- ). A distinguished British organist and conductor, born at Reading. He was so precocious, that at the age of eleven, entirely self-taught, he became regular organist at St. Saviour's Church, Reading. He continued his studies by himself, and held several positions as organist until he was elected a scholar at Christ College, Cambridge, in 1892, after having won the degree of Mus. Doc. at Oxford in 1889. At Cambridge he organized a students' chorus and orchestra, with which he gave performances of Bach's cantatas in the College Chapel that attracted wide attention. In 1897 he was appointed organist of St. Asaph's Cathedral, and the next year went to Ely Cathedral, where he remained three years. In 1901 he was elected organist at New College, Oxford, and in the same year he founded in London the Bach Choir. The former post he filled with signal distinction until 1918, when he was chosen successor of Sir Hubert Parry as director of the Royal College of Music in London. The heavy duties of this position led him to resign the conductorship of the Bach Choir in 1920, which had long before that become recognized as one of the finest choruses in England. Since then, he has made occasional appearances as guest-conductor of Bach's works at festivals (Leeds, 1925; Oxford, 1922 and 1926). He was knighted in 1920.

**ALLEN, IDA COGSWELL BAILEY** (1885- ). An American dietician, born at Danielson, Conn., and educated at the English High School, Worcester, Mass., Oread Institute of Domestic Science, Worcester, and the Metropolitan Hospital, New York. She is a graduate dietician of the last-named institution. She has been dietician in several hospitals, director of domestic science at the Y. W. C. A., Worcester, Mass., lecturer on dietetics, and author of correspondence school courses. She lectured for the United States Food Administration and has broadcast lectures on diet. In 1920 she founded Mrs. Allen's

School of Good Cookery. She is a contributor to various magazines and has written several books on cooking, diet, menus, serving meals, and similar subjects, and was diet editor of the *Medical Review of Reviews*.

**ALLEN, SIR JAMES** (1885- ). A New Zealand statesman, born in South Australia and educated at Clifton College and St. John's College, Cambridge, and the Royal School of Mines. During the World War, he was a Minister of Defense under the Massey-Ward war coalition, and in 1920 he retired from politics, becoming the Dominion's High Commissioner in London. He resigned in 1926 and the next year became a member of the Legislative Council for New Zealand.

**ALLEN, JAMES LANE** (1849-1925). An American author (see Vol. I). He added to his long list of works: *The Last Christmas Tree* (1914); *Sword of Youth* (1915); *The Cathedral Singer* (1916); *Kentucky Warbler* (1918); *Emblems of Fidelity* (1919), and *The Alabaster Bow* (1923).

**ALLEN, JOEL ASAPH** (1838-1921). An American zoologist (see Vol. I). In 1916 he published an autobiographical and bibliographical paper in which he listed titles of 1433 articles published up to that date. He was editor of *The Auk* (1884-91); *Bulletin of the American Museum of Natural History* (1886-1918); the zoological numbers of the *Memoirs of the Museum* (1895-1918); *Check List of North American Birds* (1895 and 1910); *Supplement to the Code of Nomenclature and Check List of North American Birds* (1887), and *Code of Nomenclature* (1908).

**ALLEN, PERCY STAFFORD** (1869- ). An English classicist, president of Corpus Christi College, Oxford. After attending Clifton College and Corpus Christi, he was appointed assistant master at Magdalen College School, Oxford, in 1896 and from 1897 until 1901, he was professor of history at the Government College, Lahore, India. Elected a fellow of Merton College, Oxford, in 1908, he served as librarian (1915-24), as sub-warden (1919-21), and as dean (1920-22). In 1924 he was appointed president of Corpus Christi. While at Merton, he was also curator of the Bodleian Library (1913) and of the Indian Institute (1914-25). Honorary D.Litt. degrees were conferred on him by the University of Leyden in 1922, the University of Louvain in 1927, and the University of Durham in 1928, and he received an honorary LL.D. degree from the University of Birmingham in 1927. He was made a fellow of the British Academy in 1923. With H. M. Allen, he prepared *Opus Epistolarum Des. Erasmi Roterdami*, vols. i-vii (1906-28). He also published *Selections from Erasmus* (1908, 1918), and *The Age of Erasmus* (1914).

**ALLEN, WILLIAM HARVEY** (1874- ). An American social worker and publicist, born at LeRoy, Minn. He was graduated from the University of Chicago in 1897, and studied later at the universities of Leipzig, Berlin, and Pennsylvania. He was general agent for the New York Association for Improving the Condition of the Poor, 1903-07, and was a pioneer in the creation of agencies for the scientific study of social and administrative problems. He was head of the Bureau of Municipal Research, New York, 1907-14, and director of the Training School for Public Service, 1911-14. In the latter year, he was director of the University of

Wisconsin survey, and later he conducted West Virginia, Michigan and other surveys. He was also an investigator and adviser for many local, state and educational agencies. From 1915 he devoted himself to administrative problems; his organization, the Institute for Public Service, served as a clearing house for pamphlets and brochures on the subject. In 1924-25 he was the chief assistant in the cooperative and constructive survey of the public schools of New York City and in 1926 became secretary of the Municipal Economy Committee. His published works include: *Efficient Democracy* (1907); *Civics and Health* (1909); *Woman's Part in Government* (1911); *Modern Philanthropy* (1912); *Self Surveys by Colleges and Universities*; *Universal Training for Citizenship*; *Self Surveys by Teacher-Training Schools* (1917); *Teachable Facts About Bolshevism*, and numerous war facts summaries. He was the joint author of *School Reports and School Efficiency* (1906).

**ALLENBY, al'en-by, EDMUND HENRY HYNMAN** (1861- ). A British field marshal, born in Felixstowe, England. He was educated at the Royal Military College at Sandhurst and in 1882 entered the Inniskilling Dragoons, with which he served in the Bechuanaland expedition of 1884-85 and in the Zululand operations of 1888; he also served in South Africa during the Boer war (1899-1902), gaining the rank of brevet colonel. In 1902 he was given command of the Fifth Lancers and in 1905 was promoted to command the Fourth Cavalry Brigade. He was advanced to major general in 1909 and a year later became inspector of cavalry. In 1914 he went to France in charge of the cavalry division and a year later was given command of the Fifth Army Corps; shortly afterward, he became chief of the Third Army, participating in the battle of the Somme. The promotion to general was given him in 1917 and he was placed in command of the troops in Egypt and Palestine. The Palestine campaign of 1917 under his direction was brilliantly conducted, culminating in the capture of Jerusalem on Dec. 9, 1917. Later in 1918 he completed his undertaking by occupying Damascus and Beirut, and all Syria passed into the hands of the Allies. He was High Commissioner for Egypt (1919-25) and Captain of Deal Castle (1925-26). In 1928 he visited the United States and attended the American Legion Convention. For his services in the World War he was promoted to the rank of field marshal and made Viscount Allenby of Megiddo and Felixstowe. Besides being made a Commander of the Bath and Knight of Justice of St. John of Jerusalem, he received the Grand Cross of St. Michael and St. George, Grand Cross of Bath, the Distinguished Service Medal of the United States, the Croix de Guerre of both France and Belgium, and many other foreign decorations. For his success in the Palestine campaign, the British government made him a grant of £50,000. Consult *With Allenby in Palestine*, by F. S. Brereton (1920); *Allenby's Final Triumph* by W. T. Massey (1920); and *Allenby of Armageddon*, by Raymond Savage (1925).

**ALLENSTEIN-MARIENWERDER, al'ten-stin-ma-re'en-ver'der.** Articles 94-98 of the Treaty of Versailles, as a result of the demands of the Poles, provided for the holding of plebiscites in the two regions known as Allenstein and Marienwerder (total area 15,000 square kilo-

meters). Allenstein, made up of eight East Prussian districts (*Kreise*), had a population of 558,000, of whom 268,000 were Poles and 288,000, Germans. The Poles were Protestants, however, and were estranged from the great body of Catholic Poles. Marienwerder, consisting of four West Prussian districts on the East bank of the Vistula, had a population of 24,000 Poles and 114,000 Germans. Its disposition was important to Poland because it was traversed by the Danzig-Mlava Railway, the shortest route from Danzig to Warsaw. Inter-Allied commissions controlled both areas until the plebiscite date, June 11, 1920, when the returns showed 98 per cent of the vote in Allenstein and 92 per cent in Marienwerder favorable to Germany. The two regions were therefore turned over to Germany.

**ALLEN TREATMENT FOR DIABETES.** See DIABETES.

**ALLIANCE FRANÇAISE, FÉDÉRATION DE L'** (*al'yün's' frän'säz', federa'sjö de l'*). An association of societies founded for the purpose of encouraging in the United States and Canada the study and cultivation of the language, literature, art, and history of France. Established in 1902, it increased its groups from 150 in 1916 to 250 in 1928. It published a year book (*Bulletin Officiel*) and a monthly, *L'Écho de la Fédération*, both in French. The Molière centenary was celebrated in 1922 and the Pasteur anniversary in 1923, while the Fédération celebrated its own twenty-fifth anniversary in 1927. A Congress of the French Language and Literature was organized in 1922 by the Fédération in Chicago. The French Academy awarded Le Grand Prix de la Langue Française to the organization in 1925. Every year, the Fédération brings one or more eminent men of letters from France as official lecturers to speak before the groups and affiliated societies, and organizes lecture tours for other distinguished French travelers.

**ALLIED DEBTS.** See FINANCE AND BANKING, *Inter-Governmental Debts*.

**ALLIN, CEPHAS DANIEL** (1875-1927). An American political scientist and educator, born at Clinton, Ont., and educated at the universities of Toronto, Harvard, Berlin, and Oxford. After teaching successively political science at Leland Stanford Jr. University and history at Queen's University (Canada), 1902-07, he entered the University of Minnesota in 1907 as instructor in political science. He was assistant professor, associate professor, and professor of public law, 1910-19, and chairman of the department of political science, 1920-27. Besides contributions to professional journals, he wrote: *The Early Federation Movement of Australia* (1907); *Annexation, Preferential Trade and Reciprocity* (1911), and *The Tariff Relations of the Australian Colonies* (1917).

**ALLINSON, ANNE CROSBY EMERY** (Mrs. FRANCIS GREENLEAF ALLINSON (1871-)). An American writer on the Greek and Latin classics (see Vol. I). She was alumnae director at Bryn Mawr College, 1906-08, and acting dean of the Women's College at Brown University in 1920-21 and for one semester, 1922-23. She received the degree of Litt.D. from Bowdoin College in 1911 and from Brown University in 1916. In her two books, *Greek Lands and Letters*, written with her husband (Boston, 1909 and 1912) and *Roads From Rome* (New York, 1913 and 1922), as well as in contributions to

magazines, she describes in an engaging way her travels in Greece and Italy, recalling the literary and artistic associations of the places visited and showing the influence of natural environment on literature. She wrote also: *Children of the Way* (1923) and *Friends With Life* (1925).

**ALLIS, EDWARD PHELPS, JR.** (1851-). An American manufacturer and zoologist, born in Milwaukee, Wis. He was educated at the Delaware Literary Institute, at Antioch College, and at the Massachusetts Institute of Technology. He was graduated from the last-named institution in 1871. He was a member of the firm of Edward P. Allis and Company, of Milwaukee, Wis., 1871-89, and vice president after 1889. He established at Milwaukee the Lake (now the Allis Research) Laboratory in 1887 as a private institution, and removed it to Mentone, France, in 1890. Thereafter he and his associates conducted at Mentone special researches into vertebrate morphology. The University of Wisconsin conferred on him the degree of LL.D. in 1903. He was an associate in zoology at the Harvard University Museum in 1911, and he received in 1914 the honorary degree of M.D. from the University of Groningen. The work of Dr. Allis has won many marks of recognition from the learned and scientific societies of which he was a member. He was made laureate of the Institute of France when he received the Lallemand Prize and an officer of the Academy when the Academic Palms were awarded to him; he was made, also, a chevalier of the Legion of Honor. From 1887 he was, with Dr. Charles Otis Whitman, editor of the *Journal of Morphology*, and he was a member of the editorial board, 1908-11.

**ALLISON, DAVID CLARK** (1881-). An American architect, born in Hookstown, Pa. He took a special course in architecture at the University of Pennsylvania and studied also at the École des Beaux Arts in Paris. Beginning the practice of his profession at Pittsburgh, Pa., in 1906, he moved in 1910 to Los Angeles, Calif. He became a member of the firm of Allison & Allison. This firm designed a group of 12 buildings for the University of California, Southern Branch, and also several high-school groups, an open-air Memorial Theatre at Santa Monica, and more than 150 school buildings in California and Arizona. During the World War, he was a divisional representative of the American Red Cross with the American combat division on the British front in France.

**ALLOYS.** See CHEMISTRY, APPLIED.

**ALNAES, EYVIND** (1872-). A Norwegian organist and composer, born at Fredrikstad. He received his first instruction from private teachers in Oslo and then attended the Leipzig Conservatory from 1892-95, studying under Reinecke. From 1895-1907 he was organist in Drammen, then settled in Oslo, where in 1916 he became organist of the Church of the Redeemer, and in 1920, conductor of Holter's Chorverein. His compositions include a *Symphony in C m.*, *Symphonic Variations*, a piano-concerto in D, a suite for violin and piano, male choruses, piano pieces and songs.

**ALONSO CORTÉS, kor-täs', NARCISO** (1875-). A Spanish publicist, poet, critic, and literary historian, born in Valladolid. He was appointed to the chair of Castilian Language and Literature in Santander (1906) and many years later became director of the Instituto of his

native city. He has published, among many works, three poems, *Futiles* (1897), *Rengloncitor* (1899), and *Brizas*; (a biography) *Martínez Villergas*; and *Noticias de una corte literaria* (1906); *Romances populares de Castilla* (1906); and *Condición jurídica del extranjero en la Edad Media* (1907).

**ALPAERTS, FLORE** (1876- ). A Belgian composer and conductor, born at Antwerp. He received his musical education at the Conservatory there, under Block and Tilborghs, and in 1902 was appointed professor of fugue and composition. In 1919 he became conductor of the symphony concerts of the Zoological Society. Being especially interested in the modern Flemish school, he established the Peter Benoit Fund, which annually, in July and August, gives elaborate festivals of Benoit's works. As a guest-conductor he has made extensive tours of Belgium, Holland, and France, where he has striven to make better known the works of Flemish composers. His compositions include an opera, *Shylock* (Antwerp, 1912); the symphonic poems *Psyche*, *Pallielier*, *Renouveau*, *Cyrus*, *Symphonie du Printemps*; incidental music to Hauptmann's *Die versunkene Glocke* and Sophocles' *Oedipus on Colonus*; three cantatas; piano pieces, and songs.

**ALSACE-LORRAINE**, al'zàs-lòr-ràn'. Since 1918, again the French departments of Bas-Rhin, Haut-Rhin, and Moselle. Area, 5605 square miles; population, in 1921, 1,709,749, as compared with 1,874,014 in 1910. According to the 1910 census, 1,634,240 were German-speaking and 204,262 French-speaking inhabitants. Roman Catholics numbered 1,428,343; Protestants, 408,274; Jews, 30,483. The falling off in population was accounted for in part by the loss of 45,000 men in the War and the emigration of from 75,000 to 118,000 German citizens during 1918-21. According to a 1923 estimate, Germans in the three departments numbered 70,434 unnaturalized, and 78,000 naturalized. Other foreign nationals numbered 60,300. The French-speaking population was on the increase through the return of large numbers of former residents. Principal cities with their populations in 1926 were Strassburg, 174,492 (166,767 in 1921); Mulhouse (Mülhausen), 99,892; Metz, 69,624; Sarreguemines, 14,318; Colmar, 42,255; Thionville, 13,410; Guebwiller, 11,520. The last four figures are from the census of 1921. After 1920, instruction was in French, a certain amount of time, however, being set off for religious instruction in German in certain Alsatian districts. The University of Strassburg was opened in 1919, and in 1925 had 2729 students.

**Industry.** Agriculture continues to engage the attention of a large proportion of the population. The leading crops were wheat, oats, rye, barley, sugar beets, hops, potatoes. The production of wine is also of great importance. The economic importance of the departments to France, however, lay in their mineral wealth. In Alsace were to be found petroleum and great potash fields; in Lorraine, some of the greatest iron deposits in Europe. In fact, from Lorraine, Germany derived 75 per cent (21,000,000 long tons) of all the iron mined in the Empire. In 1925 the output of iron ore had reached 15,465,514 metric tons; which totaled more than half of the whole French yield. Coal, mined largely in that portion of the Saar Basin deposits which extends into Lorraine, yielded 3,795,262 tons in 1913 and 5,270,310 in 1926.

In the potash mines of Alsace, whose acquisition made France the greatest producer in the world, 1,926,026 tons were mined in 1926 and 657,087 in 1921, as compared with 355,341 tons in 1913. Alsace-Lorraine contains the only oil fields of commercial importance in France, but supplies only about 10 per cent of the total consumption. As a result of these natural resources, the Lorraine is the seat of a great iron and steel industry. In 1925 pig iron produced was 3,200,000 tons, as compared with 3,460,000 tons in 1913; steel, in 1925, showed a production of 2,700,000 tons, as compared with 22,260,000 tons in 1913. On the other hand, the textile industry is first in importance in Alsace, and by its addition it increased the number of spindles for the whole of France by 23 per cent. The railroad system ranks with the best in France. There are 131 kilometers of rivers open to navigation and 368 kilometers of canals.

**Government.** By decree, in 1918, the French Republic took over the administration of the provinces, and a High Commission, accompanied by a military force, was installed at Strassburg. To the High Commissioner were delegated the functions of supervising the activities of the three departments and of recommending appropriate legislation to the French Chambers during the extremely delicate transitional period. The introduction of the French code was to be only gradual. The first step was the installation of the French electoral and fiscal systems on Oct. 17, 1919. For a closer understanding between population and administration, a common regional council was erected with legislative powers concerning budgeting but with only consultative powers in all other matters. The French language was introduced in the schools, though religious instruction in German among Alsations was for the time being maintained. The districts of Lower Alsace, Upper Alsace, and Lorraine have now been incorporated in France proper and are known, respectively, as the departments of Bas-Rhin, Haut-Rhin, and Moselle.

**History.** In accordance with the terms of the Armistice, French troops entered Mülhausen on Nov. 15, 1918, and Strassburg on November 22. On December 5, the Alsace-Lorraine Diet, which had been erected by Germany in 1911 in response to a demand for popular government, converted itself into a national assembly and formally welcomed the return of the French administration. Its president declared: "*Le référendum est fait!*" and four days later the French President replied: "*Le plébiscite est fait!*" The occupation was thus complete, and the answer was given to that branch of Allied opinion, including the Socialists, which sought the holding of a plebiscite in the two provinces in order to invest the restoration with a legal sanction. A year later, in November, 1919, Alsations and Lorrainers, as Frenchmen, took part in the general election to the satisfaction of all the political parties. In the years immediately following the War, the problems of administration concerned themselves with the readjustments in finance, education, language, etc. It was inevitable, of course, that difficulties should arise. Alsace, in particular, had been essentially a German province, and the transitional period brought with it a derangement of habitual manners and modes of thought. There was grumbling over the substitution of a French bureaucracy for the German, over the tardy settlement of the language and religious questions,



over the too zealous application of martial law, and the inability of the Government to convert the German currency into the French with consistency. It was not until June, 1922, that the French Government was able to straighten out the financial tangle by providing funds through which the provinces' banks might convert the currency at the authorized rate, viz., 1.25 francs per mark.

The religious question, particularly in Alsace where a large part of the population is Catholic, provided the centre for a stormy controversy which for a while involved all France. When, in January, 1920, the French occupied the two provinces, Marshal Joffre promised that their longstanding customs would not be disturbed. When Premier Herriot came into power in 1924, however, he proceeded with his plan of abolishing the French Embassy at the Vatican, and announced that Alsace-Lorraine would be brought under existing laws separating Church and State. Violent and continued opposition on the part of French Catholics arose. On Jan. 26, 1925, the Premier stated that, for the time being, the old Concordat of Napoleon would continue to govern the relations of the provinces to the Papacy, and a chargé d'affaires was maintained at Rome to represent them. On March 14, Archbishop Ruch of Strassburg called a three-day strike of school children as a protest against the setting up by the Government of certain interdenominational schools. The strike was only partially obeyed. When the Herriot ministry fell in April, 1925, the controversy subsided for a while. The elements of discontent, however, were still present, showing themselves in such incidents as the organization of the "Heimattbund" and its issuance, in June, 1926, of a manifesto demanding partial self-government for Alsace-Lorraine, and also the protest to Premier Poincaré presented later by a number of deputies from the two provinces against the use of French instead of German as the official language in that territory. In September, 1927, the Heimattbund was expanded into a political party called "The Autonomist Party of Alsace-Lorraine." Its professed aim was to establish the provinces into an autonomous state which would, however, remain within the political structure of France. The growing agitation for autonomy was supported by one section of the Catholic population (although other Catholics were opposed to it) and by the Communists. On Nov. 13, 1927, the government suppressed three papers in Alsace-Lorraine urging autonomy. Shortly thereafter, the discovery of an alleged insurrectionary plot led to a number of arrests. On May 1, 1928, fifteen of those arrested were brought to trial at Colmar and four were convicted, including two leaders, Georges Ricklin and Victor Rossé, who were deputies-elect to the French Chamber of Deputies. Rossé was pardoned on July 17, together with two others, but Ricklin was not included as he had appealed his conviction in court. Both Rossé and Ricklin were expelled from the Chamber of Deputies, but, in the succeeding elections to replace them, the autonomist candidates were chosen by large majorities.

**ALSTON, ROBERT COTTEN** (1873- ). An American lawyer, born in Barber County, Ala., and educated at the University of Alabama and the Atlanta Law School (Ga.). He began practicing in Atlanta in 1893 and until 1903 was a member of the firm of Tompkins & Alston.

He was later a member of the firm of McDaniel, Alston & Black, and from 1911 to 1921 of the firm of Robert C. & Philip H. Alston. In the latter year, the firm became Alston, Alston, Foster & Morse. Some of the positions he has held are general counsel of the Southern Express Company, special counsel of the Atlantic Coast Line Railroad, and general attorney of the American Railway Express Company. He was president of the Georgia Bar Association (1913-14) and chancellor of the diocese of the Protestant Episcopal Church of Atlanta, from 1907. He received the degree of D.C.L. from the University of the South in 1918.

**ALTHOFF, Rt. Rev. HENRY** (1873- ). An American Roman Catholic bishop, born in Aviston, Ill., and educated at St. Joseph's College, Teutopolis, Ill., St. Francis Solanus College, Quincy, Ill., and the University of Innsbruck, Austria. He was ordained priest in the Roman Catholic Church at Innsbruck in 1902. After serving as assistant and as pastor in Missouri and in Illinois, he was consecrated bishop of Belleville, Ill., in 1914.

**ALTSCHULER, MODEST** (1873- ). A Russian orchestral conductor, born at Mogilev, Feb. 15, 1873. From 1886 to 1890, he was a pupil at the Moscow Conservatory, studying cello with Fitzenhagen and composition with Arensky, Safonov, and Taneiev. After touring Russia with his own trio, he came to New York, where in 1903 he organized the Russian Symphony Orchestra for the purpose of introducing the works of the then little-known Russian composers. Among those whom he first introduced to American audiences were Rachmaninov, Ippolitov-Ivanov, Skriabin, Liadov, Vassilenko, Spendiariov, and Konius. Players who made their American début under his baton include Elman, Lhevinne, Rachmaninov, and Margaret Volavv. On Mar. 20, 1915, he gave the first complete performance anywhere of Skriabin's *Prométhée*, which requires the use of a specially constructed color-keyboard. From the very beginning, Altschuler's concerts met with success. In 1920 the orchestra was disbanded, after accomplishing the object for which it was founded. In 1929 he became conductor of the newly established Los Angeles Symphony Society.

**ALUMINA CEMENT.** See CEMENT.

**ALUMINUM, or ALUMINUM.** The world's output of aluminum in 1914 amounted to 73,000 metric tons; it reached a maximum of 205,000 metric tons in 1928. The United States generally produced from 35 per cent to 50 per cent of the world's output; at the same time, it imports a certain amount and in 1926 the amount imported reached a record total for metal, crude scrap and alloys, of 74,878,767 pounds. The world's production which reached a war-time maximum of 163,000 metric tons in 1918, declined to 75,000 metric tons in 1921. Since 1921 the world output has steadily increased, reaching a total of 204,000 metric tons in 1927 and an estimated total of 205,000 metric tons in 1928. According to the U. S. Bureau of Mines, the value of the new aluminum produced in 1928 in the United States was \$47,899,000, as compared with \$39,266,000 in 1927. Domestic aluminum was quoted at \$.28 per pound during the greater part of 1924 and 1925, and at \$.29 per pound late in 1925 and until Jan. 2, 1926, when the price was returned to \$.28 per pound for 99 per cent aluminum, where it remained until July 9, 1926, when a

new price classification was announced and 99 per cent plus grades were quoted at \$.27 per pound; in January, 1927, the price was further reduced to \$.26 per pound, and on Oct. 20, 1927, it was reduced to \$.25 per pound, being further reduced to \$.243 per pound on Dec. 28, 1927, at which level it has remained through 1928. The 98-99 per cent grade was quoted at \$.004 to \$.01 per pound lower than the 99 per cent plus grades, and foreign aluminium was approximately \$.03 per pound cheaper than the corresponding grades in the United States.

sidered usable could be employed in making the metal by introducing certain refinements into the metallurgical process and by new developments in the production of industrially desirable silicon-aluminum alloys. The world's production of aluminum since 1914 is shown in the accompanying table.

**ALUMINUM SALTS.** See CHEMISTRY and BAUXITE.

**ALVAREZ, ál'vá'rá,** WALTER CLEMENT (1884- ). An American physician born in San Francisco. Having received medical degrees from Cooper Medical College in 1905 and Har-

## ESTIMATED WORLD'S PRODUCTION OF ALUMINUM

(In metric tons)  
According to Mineral Industry

Year	Austria	Canada	France	Germany	Great Britain	Italy	Norway	Switzerland	United States	Total
	( <sup>a</sup> )	( <sup>a</sup> )	( <sup>b</sup> )	( <sup>a</sup> )	( <sup>a</sup> )	( <sup>b</sup> )	( <sup>b</sup> )	( <sup>a</sup> )	( <sup>a</sup> )	
1914	4,000	6,820	9,967	800	8,000	937 <sup>a</sup>	2,500	10,000	30,000	73,000
1915	2,500	8,490	6,020	2,000	6,000	904 <sup>a</sup>	3,500	12,500	35,000	77,000
1916	5,000	8,800	9,604	8,000	4,000	1,126	4,727	15,000	50,000	106,000
1917	5,000	11,800	11,066	15,000	6,000	1,740 <sup>a</sup>	8,000	15,000	65,000	138,000
1918	8,000	15,000	13,023	25,000	14,000	1,715 <sup>a</sup>	7,000	15,000	65,000	163,000
1919	5,000	15,000	10,255	15,000	10,000	1,673 <sup>a</sup>	3,500	15,000	61,000	137,000
1920	2,000	10,000	12,304	10,000	8,000	1,238 <sup>a</sup>	6,000	12,000	63,000	125,000
1921	2,000	6,000	8,382	10,000	5,000	744 <sup>a</sup>	6,000	10,000	27,000	75,000
1922	4,000	9,000	7,494	12,000	9,500	810 <sup>a</sup>	6,000	12,000	36,000	99,000
1923	4,000	16,500	14,343	15,900	9,000	1,473	13,319	12,000	63,000	150,000
1924	3,000	16,000	16,315	18,400	8,000	2,058	10,953	19,000	68,000	170,000
1925	4,000	17,000	18,408	25,000	9,500	1,880	21,304	20,000	66,000	183,000
1926	2,700	18,000 <sup>a</sup>	21,000	30,000	7,000	1,929	24,429	20,000	68,000	193,000
1927	3,000	27,000 <sup>a</sup>	20,000	31,700	7,300 <sup>a</sup>	1,800 <sup>a</sup>	21,000	20,000	72,000	204,000
1928	27,000	22,000 <sup>a</sup>	18,000	30,000	6,750 <sup>a</sup>	2,250 <sup>a</sup>	19,000	19,000	81,500	205,000 <sup>a</sup>

(<sup>a</sup>) As estimated by Robt. J. Anderson and J. W. Richards.

(<sup>b</sup>) Official statistics.

(<sup>c</sup>) Estimated from exports and other official data.

(<sup>d</sup>) Spain estimated to have produced 1,350 metric tons in 1928.

The expansion in the consumption of aluminum since 1921 is directly connected with the increased productive activity of the automobile industry. Pistons and other reciprocating parts of automotive engines are important outlets for large tonnages of aluminum and high strength aluminum alloys. Duralumin connecting rods are used in several motor-car engines. Duralumin is an alloy of aluminum with copper, manganese, and magnesium, having a maximum specific gravity of 2.75 and a tensile strength of 55,000 pounds per square inch. The recent trip of the *Graf Zeppelin* between Germany and the United States was of special interest in this connection, as this airship was constructed largely of duralumin and other aluminum-alloy parts were used in the motors. The Ford trimotor airplanes, also, are largely of duralumin construction.

Other uses of aluminum of growing importance, in addition to its use in household ware and various sorts of containers of that nature, are in the production of aluminum foil and collapsible tubes where it has supplanted tin to some extent; in bronze powder and in solid rubber tires for motor cars and trucks; in the radio industry; in the production of aluminum-coated steel plate to compete with tinplate; in household refrigerating units; chairs and other office furniture; and aluminum powder is also finding greater utilization in the manufacture of various aluminum paints. In steel metallurgy it is employed for oxidizing and for thermite purposes, and for alloys. Formerly, silicon had been believed to be very harmful in the metal, and in all steps in mining the ore and in making aluminum, precautions were taken to remove silica, but more recent research has indicated that bauxite of lower grade than had been con-

sidered usable could be employed in making the metal by introducing certain refinements into the metallurgical process and by new developments in the production of industrially desirable silicon-aluminum alloys. The world's production of aluminum since 1914 is shown in the accompanying table.

**ALVAREZ, QUINTERO, SERAFIN** and **JOAQUIN** (born in 1871 and 1873, respectively- ). Spanish dramatists. These two brothers collaborated all their works, their plays dealing almost exclusively with Andalusia. In both the comedy of manners and the *género chico*, their plays are outstanding. Both brothers have been elected to the Spanish Royal Academy of the Language. Among their principal works are *Las de Caín*; *Amores y amores*; *Puebla de majeres*; *El amor que pasa*; *Doña Clarines*; *El genio alegre*; *Mañana del sol*; *Pipiola*; *El centenario*; and *El cuartito de hora*.

**ALVEAR, MARCELO T. DE** (1868- ). A President of the Argentine Republic, born at Buenos Aires, educated at the university there, and elected to the National Congress in 1912. In 1916 he was appointed minister of Argentina to Paris, and from Oct. 12, 1922 to Oct. 12, 1923, he was President of the Republic. He was a member of the Radical Party. See ARGENTINA, History.

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**AMATOL**. See EXPLOSIVES.

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**AMERICAN COUNCIL ON EDUCATION**. See EDUCATION IN THE UNITED STATES.

**AMERICAN EXPEDITIONARY FORCE**. See WORLD WAR; ARMIES AND ARMY ORGANIZATION.

new price classification was announced and 99 per cent plus grades were quoted at \$.27 per pound; in January, 1927, the price was further reduced to \$.26 per pound, and on Oct. 20, 1927, it was reduced to \$.25 per pound, being further reduced to \$.243 per pound on Dec. 28, 1927, at which level it has remained through 1928. The 98-99 per cent grade was quoted at \$.004 to \$.01 per pound lower than the 99 per cent plus grades, and foreign aluminum was approximately \$.03 per pound cheaper than the corresponding grades in the United States.

sidered usable could be employed in making the metal by introducing certain refinements into the metallurgical process and by new developments in the production of industrially desirable silicon-aluminum alloys. The world's production of aluminum since 1914 is shown in the accompanying table.

**ALUMINUM SALTS.** See **CHEMISTRY** and **BAUXITE**.

**ALVAREZ**, ál'vá'rá, WALTER CLEMENT (1884- ). An American physician born in San Francisco. Having received medical degrees from Cooper Medical College in 1905 and Har-

ESTIMATED WORLD'S PRODUCTION OF ALUMINUM  
(In metric tons)  
According to Mineral Industry

Year	Austria	Canada	France	Germany	Great Britain	Italy	Norway	Switzerland	United States	Total
	(a)	(a)	(b)	(c)	(a)	(b)	(b)	(c)	(a)	
1914	4,000	6,820	9,967	800	8,000	937*	2,500	10,000	30,000	73,000
1915	2,500	8,490	6,020	2,000	6,000	904*	3,500	12,500	35,000	77,000
1916	5,000	8,800	9,604	8,000	4,000	1,126	4,727	15,000	50,000	106,000
1917	5,000	11,800	11,066	15,000	6,000	1,740*	8,000	15,000	65,000	138,000
1918	8,000	15,000	12,023	25,000	14,000	1,715*	7,000	15,000	65,000	163,000
1919	5,000	15,000	10,255	15,000	10,000	1,673*	8,500	15,000	61,000	137,000
1920	2,000	10,000	12,304	10,000	8,000	1,238*	6,000	12,000	63,000	125,000
1921	2,000	6,000	8,382	10,000	5,000	744*	6,000	10,000	27,000	75,000
1922	4,000	9,000	7,494	12,000	9,500	810*	6,000	12,000	36,000	99,000
1923	4,000	16,500	14,343	15,900	9,000	1,473	13,319	12,000	63,000	150,000
1924	3,000	16,000	16,315	18,400	8,000	2,058	19,953	19,000	68,000	170,000
1925	4,000	17,000	18,408	25,000	9,500	1,880	21,304	20,000	66,000	183,000
1926	2,700	18,000*	21,000	30,000	7,000	1,929	24,429	20,000	68,000	193,000
1927	3,000	27,000*	20,000	31,700	7,800*	1,800*	21,000	20,000	72,000	204,000*
1928	27,000	22,000*	18,000	30,000	6,750*	2,250*	19,000	19,000	81,500	205,000*

(a) As estimated by Robt. J. Anderson and J. W. Richards.

(b) Official statistics.

(c) Estimated from exports and other official data.

(\*) Spain estimated to have produced 1,350 metric tons in 1928.

The expansion in the consumption of aluminum since 1921 is directly connected with the increased productive activity of the automobile industry. Pistons and other reciprocating parts of automotive engines are important outlets for large tonnages of aluminum and high strength aluminum alloys. Duralumin connecting rods are used in several motor-car engines. Duralumin is an alloy of aluminum with copper, manganese, and magnesium, having a maximum specific gravity of 2.75 and a tensile strength of 55,000 pounds per square inch. The recent trip of the *Graf Zeppelin* between Germany and the United States was of special interest in this connection, as this airship was constructed largely of duralumin and other aluminum-alloy parts were used in the motors. The Ford trimotor airplanes, also, are largely of duralumin construction.

Other uses of aluminum of growing importance, in addition to its use in household ware and various sorts of containers of that nature, are in the production of aluminum foil and collapsible tubes where it has supplanted tin to some extent; in bronze powder and in solid rubber tires for motor cars and trucks; in the radio industry; in the production of aluminum-coated steel plate to compete with tinplate; in household refrigerating units; chairs and other office furniture; and aluminum powder is also finding greater utilization in the manufacture of various aluminum paints. In steel metallurgy it is employed for oxidizing and for thermite purposes, and for alloys. Formerly, silicon had been believed to be very harmful in the metal, and in all steps in mining the ore and in making aluminum, precautions were taken to remove silica, but more recent research has indicated that bauxite of lower grade than had been con-

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**AMERICAN FARM BUREAU FEDERATION.** See AGRICULTURE.  
**AMERICAN INDIANS.** See ETHNOGRAPHY.

**AMERICAN LAW INSTITUTE.** See LAW, PROGRESS OF THE.

**AMERICAN LITERATURE.** See LITERATURE, ENGLISH AND AMERICAN.

**AMERICAN MUSEUM OF NATURAL HISTORY.** See EXPLORATION.

**AMERY, a'mér-i, Rt. Hon. LEOPOLD C. M. STENNETT** (1873- ). A British politician (see VOL. I). After serving in the World War, he was reelected to Parliament in 1918. He was assistant secretary of the War Cabinet (1917); member of the staff of the War Council, Versailles, and of the staff of Secretary of State for War (1917-18); Parliamentary Under-Secretary for the Colonies (1919-21); Parliamentary and Financial Secretary to the Admiralty (1921-22); and First Lord of the Admiralty (1922-24). He was appointed Secretary of State for Dominion Affairs and the Colonies in 1924. *The Empire in the New Era*, speeches delivered during his empire tour in 1927, were published in 1928, with a foreword by the Earl of Balfour.

**AMES, JOSEPH SWEETMAN** (1864- ). An American physicist (see VOL. I). In 1917 he was a member of the National Advisory Committee for Aeronautics, and in the same year was also chairman of the foreign service committee of the National Research Council which visited France and England for the purpose of investigating scientific activities in connection with warfare. He became a member of the National Advisory Committee on Aeronautics in 1917 and chairman in 1927. In June, 1929, he was elected president of Johns Hopkins, to succeed Frank J. Goodnow, whose resignation took effect July 31, 1929. Dr. Ames had been provost of the university and dean of the college faculty for the preceding three years. He published *The Constitution of Matter* (1913).

**AMES, OAKES** (1874- ). An American botanist, born at North Easton, Mass., and educated at Harvard University. Beginning as an assistant in botany (1899-1900), instructor, (1900-10), and assistant director of the Botanical Garden at Harvard (1899-1910), he became assistant professor of economic botany in 1915 and professor of botany in 1926. He was director of the Botanical Garden, 1910-22. He has been recognized as an authority on orchids, concerning which he has written numerous papers for botanical periodicals. He wrote *Notes on Philippine Orchids* (Boston, 1920) and a monumental serial work, *Orchidaceæ*, of which seven volumes have been published.

**AMES, WINTHROP** (1871- ). An American theatrical and operatic producer (see VOL. I). In recent years, his most noteworthy successes as a producer have been his brilliant revivals (1927-28) of the Gilbert and Sullivan operas in London and New York.

**AMHERST COLLEGE.** A non-sectarian institution for men at Amherst, Mass., founded in 1821. The enrollment increased from 416 in 1914 to 739 in 1928-29, the faculty from 43 to 65 members (exclusive of emeritus and administrative officers and those on leave), and the library from 107,800 to 151,000 volumes. The productive funds were increased from \$2,776,000 to \$7,250,000 and the income from \$224,800 to \$712,000. The George Daniel Olds professor-

ship in economics was established in 1914; Edward C. Converse gave \$250,000 for a new library building for a memorial to his brother, James B. Converse; and Mrs. Rufus Pratt Lincoln endowed a professorship in science in memory of her son, Rufus Tyler Lincoln, in 1916. The Amherst Memorial Fellowships were established in 1919 and the John Woodruff Simpson Fellowships and Lectureships in 1922; Morrow Dormitory, designed to accommodate 63 students and one member of the faculty, the gift of Mr. and Mrs. Dwight W. Morrow, was opened for occupancy at the beginning of 1926; the Charles Morton Merrill Fund (scholarship), was established through the gift of securities valued at about \$100,000, in 1928; The Anson D. Morse Professorship of History was established in the same year by the gift of \$160,000 from a donor whose name was not made public; and the Moore Chemistry Laboratory, the gift of Mrs. William Henry Moore, Edward Small Moore, and Paul Moore, was under construction in 1928. Other developments during the period under review included: Experiments, begun in 1920, in conducting classes for workers in Holyoke and Springfield; the Amherst plan for alumni reading and study which was initiated in 1922; the alumni subscription of a centennial gift fund of \$3,000,000 for the college in 1921, and a series of publications, to be known as the Amherst Books, was started. President, Arthur Stanley Pease, Ph.D.

**AMIDON, SAMUEL BARKER** (1863-1925). An American lawyer, banker, and politician, born at Perry, Ohio, and educated at the Geneva (Ohio) Normal School, Oberlin College, and Hiram College. He began the practice of law in 1886. He was president or director of numerous banks and business concerns in Kansas, especially in Wichita, his home city. From 1902 to 1904 he was a member of the Democratic State Committee of Kansas, and was appointed to the Democratic National Committee in 1917. He became vice chairman of the latter in 1919, as well as assistant to the Attorney General of the United States in the prosecution of the I. W. W. cases in Kansas.

**AMMONIA.** See CHEMISTRY, APPLIED; COKE; EXPLOSIVES; FERTILIZERS.

**AMMONS, ELIAS MILTON** (1860-1925). A former Governor of Colorado. He was born in Macon County, N. C., was taken to Colorado in 1871, and was educated at the East Denver High School. He worked at various odd jobs during his boyhood and later joined the staff of the *Denver Times*. In 1885 he went into ranching and in 1890 entered politics as clerk of the District Court of Douglas County, Colo. After service in both houses of the State Legislature (speaker of the House of Representatives, 1893-94), he was elected Governor of Colorado, as a Democrat, in 1913. He served until 1915. He did much for the advancement of agriculture and agricultural education in his State.

**AMMUNITION.** See ORDNANCE; ARTILLERY; SMALL ARMS.

**AMSTERDAM.** The first city and second port of the Netherlands (see VOL. I), situated at the confluence of the Amstel with the Y (an arm of the Zuider Zee) in the province of North Holland. The Queen spends six days annually in the city, where the Dutch monarchs are crowned at Saint Catharine's. The number of inhabitants was 609,084 in 1914; 642,162 according to the census of Dec. 31, 1920; 696,484 in

1922; 706,194 in 1923; and 726,327 in 1926. In 1922 nearly 29 per cent of the population belonged to the Dutch Reformed Church, about 23 per cent to the Catholic Church, 10 per cent were Jewish, 16 per cent belonged to other religions, and nearly 22 per cent were without religious affiliations. The city is governed by a council, whose members are elected for four years, with a mayor appointed by the Crown as president. The mayor, and from two to six aldermen chosen by the council from among its members, act as the executive, with the right of suspending the resolutions of the council for thirty days.

Diamond polishing continues to be the chief industry and in 1922 there were 8300 workers in 51 shops. The other more important industries are machinery manufacturing, shipbuilding, and sugar refining. The trade with the colonies, particularly the Dutch East Indies, continues to be of the first importance. The accompanying table shows the sea-going vessels entering the port:

Year	No. of ships	Net Register Tonnage
1914	2,403	1,346,687
1915	1,820	1,764,191
1916	1,622	1,158,812
1917	699	418,641
1918	378	153,592
1919	1,366	1,285,862
1920	2,184	1,988,465
1921	2,571	2,892,891
1922	2,860	3,196,099
1923	3,041	3,555,292
1924	3,016	3,836,546
1925	2,999	4,013,087
1926	3,199	4,182,196
1927	3,318	4,636,647

In 1927, 1776 of these ships were Dutch; 566, British; 484, German; and 207, Swedish. The traffic with the interior is not very prosperous because the many fees charged make it difficult to compete with the railroads and other methods of inland traffic. The table shows the Rhine traffic, the figures being in metric tons:

Year	Inward Clearances	Outward Clearances	% of the traffic of the Kingdom
1913	975,089	556,683	5.48
1917	524,933	26,006	16.91
1918	447,656	8,917	15.73
1919	370,870	77,929	9.71
1920	400,469	197,027	6.51
1921	510,621	132,616	5.55
1922	685,965	229,658	5.85
1923	387,694	108,091	5.04
1924	1,328,945	306,112	6.47
1925	1,644,330	317,517	6.25
1926	2,015,379	389,389	5.72
1927	1,747,250	552,710	5.29

The large amounts of goods entering Amsterdam in 1926 was largely to be accounted for by the English general and coal strikes.

**Bibliography.** Baedeker's *Belgium and Holland, including the Grand-Duchy of Luxembourg* (15 ed., 1910); *A Short Account of the Docks, Harbour Works, and Trading Establishments of the City of Amsterdam*, published by the municipality (1914); *A Wanderer in Holland* by E. V. Lucas (17 ed., 1920); *Het nieuwe Amsterdam van 1795 tot den tegenwoordigen tijd*, by Prof. Dr. H. Brugmans (1923); *De haven van Amsterdam en haar verbinding met de zee* by Dr. M. G. de Boer (1926); *The Traveller's Handbook to*

*Holland*, by R. Elston (1926); the annual *Report on the Condition of Commerce, Industry and Traffic* of the Chamber of Commerce and Factories of Amsterdam; and the publications of the statistical department of the city on its many and various activities.

**AMUNDSEN**, Å'mun-sen, ROALD (1872-1928). A Norwegian explorer (see Vol. I). In 1918 he started in the *Maud* from Norway to begin his drift with the ice current across the Arctic Ocean. By July, 1920, he completed the northeast passage and landed at Nome, Alaska. After another attempt to reach the Pole by a combination of boat (the *Maud*) and airplane in 1922, he became bankrupt in 1924 and came to the United States. In May, 1925, he and Lincoln Ellsworth, an American who financed him, left Spitzbergen in two seaplanes, but were forced to turn back when only 600 miles out. In May, 1926, he and Ellsworth made a 72-hour flight from Spitzbergen to Teller, Alaska, via the North Pole, in the airship *Norge*, designed and built by the Italian, General Nobile, and backed by the Italian government. Nobile and Amundsen quarreled, each claiming the credit for the flight belonged to their respective countries. When Nobile was lost on his second polar flight in the *Italia*, Amundsen, who had retired, volunteered to search for him and was last heard from June 18, 1928, a few hours after he and five others left Trömsö, Norway, by airplane in the search. All hope that he still lived was abandoned when a float, found near Trömsö on August 31, was identified as that of Amundsen's plane. His later writings include *The North-East Passage* (1918-20); *The First Flight Across the Polar Sea* (1926), and *My Life as an Explorer* (1927). See POLAR RESEARCH.

**ANÆMIA.** Up to 1926 progress in the relief of incurable primary anæmias by surgical intervention, especially by the removal of the spleen, was considerably practiced. Hundreds of such operations were performed. The removal of the organ is not followed by injurious after-effects and the operation is not especially hazardous. Usually, there is reason to suspect that the anæmia is due to some disease of the spleen, but in these pernicious forms of primary anæmia the cause is often quite obscure; the spleen is then removed as a last resort. Another surgical resource now much used in these cases is repeated transfusion of blood and the two were often combined. In 1926 one of the most decisive steps forward in the treatment of this disease had its initiation in a paper published by Minot and Murphy of Boston in the *Journal of the American Medical Association* for August 14. This consisted in the use of a blood regenerative diet, the essential constituents of which were supplied by feeding with beef liver or calves liver. About one year later, the same authors published in the same periodical for Sept. 3, 1927, an account of 100 cases treated by this diet without a single failure to respond favorably. Since the first paper by these authors the diet has had an extensive trial in most of the clinics and medical centres of the world and the unanimity in the favorable results obtained is unusual. Preparations of liver have been placed on the market and the use of the diet has been extended with some success to other forms of anæmia, including the secondary forms. For the first time we may speak of a relative cure of pernicious anæmia in place of palliation and prolongation of life; while the older methods of treatment in-



cluding repeated blood transfusion have naturally had their field narrowed although they may be used as accessories. Thus far, no satisfactory explanation has been forthcoming as to the principles involved in these favorable results. Over 2000 cases have been treated with but 1 per cent failure. See **FOOD AND NUTRITION**.

**ANATOLIA**. See **TURKEY**.

**ANATOMY**. See **ZOOLOGY**.

**ANCIENT MAN**. See **ANTHROPOLOGY**.

**ANDAMANESE**. See **ETHNOGRAPHY**.

**ANDERSEN, HENDRIK CHRISTIAN** (1872- ). An American sculptor, born in Bergen, Norway. He was taken to Newport, R. I. in 1873. He studied art and architecture in Boston, Paris, Naples, and Rome. Andersen wrote *The Creation of a World Centre of Communication*, which contains a detailed plan for the founding of a monumental city devoted to human progress; a second volume enumerates the legal and the economic advantages of a world centre. He was also founder of the World Conscience Society. His leading works in sculpture include "The Fountain of Life," "The Fountain of Immortality," "Jacob Wrestling with the Angel," "Study of an Athlete," and busts, medallions, and portraits of Pope Benedict XV. He made his home in Rome.

**ANDERSON, ALBERT BARNES** (1857- ). An American judge, born near Zionsville, Ind., and educated at Wabash College. He was admitted to the bar in 1881. He practiced at Crawfordsville, Ind., 1881-1902, and was prosecuting attorney of Montgomery County, Ind., 1886-90. He was appointed United States district judge of the District of Indiana in 1902. He presided at the trial of the so-called dynamite conspiracy case at Indianapolis in 1912 and in 1919 presided at the trial of the case against the United Mine Workers of America. Basing his decision on the Lever act, he issued an injunction against the miners' officials, demanding that the strike order be rescinded. The legality of this injunction was questioned, but the miners' officials gave in. In 1925 he was appointed judge of the United States Circuit Court.

**ANDERSON, CHANDLER PARSONS** (1866- ). An American and international lawyer, born at Lakeville, Conn., and educated at Yale University (B.A., 1887) and the Harvard Law School (1888-89). He was admitted to the New York bar in 1891 and soon attained prominence in the field of international law. In 1896-97 he was secretary for the United States and Great Britain of the Bering Sea Claims Commission, and in the following year secretary for the United States of the Joint High Commission with Great Britain for the settlement of Canadian questions. He was counsel in various international boundary disputes. From 1905 to 1910, he was special counsel for the Department of State in the negotiation of treaties with Great Britain concerning British North America. He has also been United States agent in the North Atlantic Coast fisheries arbitration at The Hague in 1910, counselor to the Department of State (1910-13), United States arbitrator in the British-American pecuniary claims arbitration (1913), legal adviser for the American embassies and legations in Europe on questions of American interests growing out of the War, and for the Department of State (1914-15), counsel on international questions for the United States War Industries Board (1917-18), counsel for the International Committee of the Red Cross

Societies in the organization of the League of Red Cross Societies in France (1919), United States arbitrator in the American-Norwegian Shipping Claims Arbitration (1921-22), United States legal expert for the Washington Conference (1921-22), and United States representative on the Mixed Claims Commission to discuss matters at issue between the United States and Germany, after 1923.

**ANDERSON, DICE ROBINS** (1880- ). An American college president, born at Charlottesville, Va., and educated at Randolph-Macon College and the University of Chicago. After teaching in various colleges and academies, he was president of Willie Halsell College, Vinita, Okla. (1906-07). He was instructor in history at the University of Chicago in 1908-09, and was professor of history and political science (1909-19) and professor of economics and political science and director of the School of Business Administration (1919-20) at Richmond College, Va. In 1920 he became president of Randolph-Macon Woman's College. He received the degree of LL.D. from the College of William and Mary in 1924. He published *William Branch Giles; a Study in the Politics of Virginia and the Nation, 1790-1815* (1914), *Edmund Randolph, Second Secretary of State* (1927), and edited the *Richmond College Historical Papers* (1915-17).

**ANDERSON, EDWIN HATFIELD** (1861- ). An American librarian (see Vol. I). As director of the New York Public Library, since 1913 Mr. Anderson continued to be engaged in its expansion. He was president of the New York Library Association in 1908, of the New York Library Club in 1910, and of the American Library Association in 1913-14. In 1916 Columbia University conferred on him an honorary M.A.

**ANDERSON, HENRY WATKINS** (1870- ). An American lawyer, born in Dinwiddie County, Va., and educated at Washington and Lee University. He began the practice of law in Richmond, Va., in 1898. In 1912 he was the reorganizer of the International & Great Northern Railroad Co. of Texas, and its general counsel from 1912 to 1914. In 1916 he received the degree of LL.D. from Washington and Lee University. In 1921 he was appointed trustee by the United States government for the Armour and Swift interests in the stockyards and in the same year was the Republican candidate for Governor of Virginia, having been unanimously endorsed in 1920 by the Republican State Committee for the nomination for vice president of the United States. In 1922-23 he was a special assistant to the Attorney General of the United States. During the War, he engaged in Red Cross work in the Balkans and received decorations from many foreign governments. In May, 1929, he was appointed a member of President Hoover's National Law Enforcement Commission.

**ANDERSON, ISABEL (MRS. LARZ ANDERSON)** (1876- ). An American author, wife of the former Minister to Belgium and former Ambassador to Japan. She was born in Boston, Mass., and educated in private schools. She was active in relief work during the World War and was awarded several American and foreign decorations. In 1918 she received the degree of Litt.D. from George Washington University. She is the author of stories for children and reminiscences of travel and diplomatic and social life, written in a lively and entertaining manner. Her works

include *The Great Sea Horse* (1909); *Captain Ginger's Fairy* (Boston, 1910); *Captain Ginger's Playmates* (Boston and Philadelphia, 1911; translated into French and German, 1911); *Every Boy and Other Children's Plays* (New York, 1914); *The Spell of Japan* (Boston, 1914); *The Spell of Belgium* (Boston, 1915); *Presidents and Pies* (Boston, 1920); *Topsy Turvy and the Gold Star* (Boston, 1920); *Polly the Pagan* (Boston, 1922); *The Kiss and the Queue* (1924); *Under the Black Horse Flag* (1925); *The Wall Paper Code* (1926); and *Circling South America* (1928). She has also contributed to periodicals.

**ANDERSON, JOHN AUGUST** (1876- ). An American astronomer, born at Rollag, Minn., who studied at Concordia College and the State Normal School at Moorhead, Minn., and Valparaiso College, Ind. He received the degree of Ph.D. at Johns Hopkins in 1907, was associate professor of astronomy there (1908-16) and since 1916 has been physicist at Mount Wilson (Calif.) Observatory, where he has specialized in spectroscopy, the ruling of gratings, and seismometers. He has been associate editor of the *American Optical Journal*. In 1928 he was elected to the National Academy of Sciences.

**ANDERSON, JOHN FISHER** (1873- ). An American physician and bacteriologist, born at Fredricksburg, Va. (see Vol. I). On Jan. 1, 1916, Dr. Anderson became director of the research and biological laboratories of E. R. Squibb & Sons, New Brunswick, N. J., also associate professor of hygiene at Rutgers College. He was co-editor of the *United States Dispensary*, 20th ed. (1918).

**ANDERSON, KARL** (1874- ). An American painter and illustrator, brother of Sherwood Anderson, the novelist. He was born at Oxford, Ohio, and educated at the Art Institute of Chicago and in Paris. He began his career as an illustrator, but turned to painting and soon achieved distinction for the beauty of his colors and the imaginative quality of his pictures, which were exhibited in galleries in Europe and America and won numerous prizes. His honors have included the silver medal of the Carnegie International Exhibition of 1910; the Lippincott Prize of the Pennsylvania Academy of the Fine Arts, 1915; the Altman Prize of the National Academy (of which Mr. Anderson is a member); the French gold medal of the Art Institute of Chicago; the gold medal of the National Arts Club of New York, and the Isador prize of the Salmagundi Club, New York. Among his best known works are "The Idlers" (Art Institute of Chicago), "Sisters" (City Museum, St. Louis), "Apple Gatherers" (Cleveland Museum), and "The Heirloom" (Pennsylvania Academy, Philadelphia).

**ANDERSON, PAUL LEWIS** (1880- ). An American expert in pictorial photography, born at Trenton, N. J. He studied electrical engineering at Lehigh University and from 1901 to 1907 held engineering positions with various electrical companies. He was one of the founders of the Struss-Anderson Laboratories for the manufacture of kalgens, a photographic developer which he originated. His photographs have been exhibited abroad and in this country. He is the author of some excellent textbooks on photography, *Pictorial Landscape Photography* (1914), *Pictorial Photography, Its Principles and Practice* (1917), and *The Fine Art of Photography* (1919).

**ANDERSON, PEIRCE** (1870-1924). An American architect, born in Oswego, N. Y. He graduated from Harvard in 1892 and took post-graduate courses at Johns Hopkins and in Paris. He received a diploma from the French government in 1900. He was with D. H. Burnham & Co. and their successors from the year 1900 to 1917, and from the latter year he was a member of the firm of Graham, Anderson, Probst & White. In 1912 he was appointed to membership in the Federal Commission of Fine Arts in succession to D. H. Burnham, deceased. He was chairman of the Central Department of the Military Training Camps Association.

**ANDERSON, SHERWOOD** (1876- ). A prominent American author. He was born in Camden, Ohio, educated in the public schools, and engaged in business and newspaper work. With the publication of *Winesburg, Ohio* (1919), he won popular recognition as a novelist. In this, as in his later works, Mr. Anderson's thesis is not leveled at the village, but at the whole character of contemporary life with its bustle, its garishness, and its want of satisfying aspirations. His *Triumph of the Egg* (1921), also a volume of short stories, catches up the theme and manner of the earlier work. These two books are, artistically, the best of Mr. Anderson's work. *Windy McPherson's Son* (1916), *Marching Men* (1917), and *Poor White* (1920) are concerned with rather inarticulate, restless young men who rebel against the confinement of their native villages and plunge into the life of the larger cities, only in the end to be thwarted in their quest for real happiness. His other works include *Mid-American Chants* (1918), *Many Marriages* (1922), a volume of poems, and *Horses and Men* (1923), *A Story Teller's Story* (1924), *Dark Laughter* (1925), *Note Book* and *A New Testament*, verse, (1926). In 1927 he became editor of two weekly newspapers in Virginia.

**ANDERSON, WILLIAM FRANKLIN** (1860- ). An American Methodist Episcopal bishop, born at Morgantown, Va. (now W. Va.) and educated at West Virginia University, Ohio Wesleyan University, Drew Theological Seminary, and New York University. He was ordained in the Methodist ministry in 1887. After holding several pastorates and offices with the Board of Education of the Methodist Episcopal Church, he was elected bishop in 1908. He was resident bishop of Chattanooga, Tenn., 1908-12, and of Cincinnati, Ohio, 1912-14. In 1914-18 he traveled widely as official supervisor of Methodist missions in Europe and Africa. During the World War, he served on the Committee of Emergency and Reconstruction of the Methodist Episcopal Church in Europe and in the Army Y. M. C. A. He was delegate of the Methodist Episcopal Church to the English and Irish Wesleyan Conferences in 1918 and fraternal delegate from the Federal Council of Churches of Christ in America to the Assemblée Générale du Protestantisme Français in Lyons, France. In 1922 he was made a knight of the Legion of Honor of France. In 1924 he became resident bishop of Boston and in 1925 acting president of Boston University, holding that office until Feb. 1, 1926. He received the degree of D.D. from Wesleyan University and that of LL.D. from Ohio Wesleyan, Upper Iowa, and Ohio Northern universities. He wrote *The Compulsion of Love* (1904) and *The Challenge of Today* (1915), with contributions to the religious and secular press.



**ANDERSON, WILLIAM HAMILTON** (1874- ). An American temperance worker, born at Carlinville, Ill., and educated at Blackburn College, Carlinville, 1892, and the University of Michigan (LL.B., 1896). After teaching school and practicing law, he became attorney of the Anti-Saloon League of Illinois in 1900 and was State superintendent of the Illinois League, 1900-06. Beginning in Illinois, he later held positions in the Anti-Saloon Leagues of New York and Maryland, and in 1914 was elected general superintendent of the Anti-Saloon League of New York; he held also various offices on the Board of Temperance, Prohibition, and Public Morals of the Methodist Episcopal Church, in the Anti-Saloon League of America, and in the World League Against Alcoholism. He received the degree of LL.D. from Illinois Wesleyan University in 1919. Besides articles contributed to various periodicals, he is the author of *The Church in Action against the Saloon* (Westerville, Ohio, 1906; 2d edition, 1910) and *The "Jonkers Plan" for Prohibition Enforcement* (Westerville, 1921).

**ANDLER, CHARLES** (1866- ). A French professor at the Collège de France (1926- ), who, after his graduation from the Sorbonne, devoted himself to German philosophy and literature. By 1908, after teaching in various lycées, he had become a full professor at the University of Paris and gathered around him quite a group of young *Germanistes français*, whose object it was to bring about an intellectual *rapprochement* between France and Germany. He had a six-volume critical biography of Nietzsche in press, but the World War put off its publication until 1920-25. The volumes were entitled *Les Précurseurs de Nietzsche*, *La Jeunesse de Nietzsche*, *Nietzsche et le Pessimisme Esthétique*, *Nietzsche et le Transformisme Intellectuel*, *La Maturité de Nietzsche* and *La Dernière Philosophie de Nietzsche: le Renouveau de Toutes les Valeurs*. They portray the German philosopher as an opponent of modern junkerism and essentially a French genius nourished by the work of the French psychological moralists. During the War, Professor Andler published four volumes on the rise of the Pan-Germanist movement. His other works include *La Philosophie de la Nature dans Kant* (1891); *Les Origines du Socialisme d'État en Allemagne* (1897); *Le Socialisme impérialiste dans l'Allemagne contemporaine* (1912), and *La Décomposition politique du Socialisme allemand* (1918).

**ANDORRA, An-dor'ra.** A semi-independent republic in the Eastern Pyrenees between the French department of Ariège and Catalonia in Spain. Its total area is 191 square miles; its population at the latest count available in 1928, 5231, scattered among six villages, the largest of which is the capital, Andorra la Vella. It is ruled jointly by the Bishop of Urgel and the French Republic, which maintains a permanent delegate in the country. Both authorities receive a biennial due from the native government. The excellent pasture land of the valley in which the Republic is located furnishes the livelihood of its inhabitants. Coarse cloth is made from the wool of the flocks, some of which is exported. Grains are imported from France. The projected trans-Pyrenean railway was to pass within a few miles of the frontier and thus facilitate communications with the outside world. Communications are maintained by means of wagon-road with both Spain and France. Cata-

lan is spoken by the natives, who embrace Catholicism. French and Spanish currencies are both in use, though the French people exert a predominant influence.

**ANDRÁSSY, An-dra-shi, COUNT JULIUS** (1860-1929). A Hungarian statesman (see Vol. I). In 1915 he urged making peace and an extension of the franchise in Hungary. As Foreign Minister, in 1918, he declared the alliance with Germany dissolved and tried to conclude a separate peace (Nov. 1). He retired from office in the same year, but was returned to the National Assembly as a non-partisan delegate (1920). He became leader of the Christian National Party, resigned because he was suspected of aiding ex-King Charles in his attempted return to the throne of Hungary (October, 1921), and built up the National Christian Farmer and Citizen Party. His later works include *A Száműzött Rákóczi* (1914); *Whose Sin is the World War?* (1915); *A magyarság és németység érdekszolidaritása* (1916); *Interessensolidarität des Deutschlands und Ungarns*; *Diplomacy and the War* (1920); and *Bismarck, Andrassy and Their Successors* (1924, trans. 1927).

**ANDRÉEV, LEONID NIKOLAEVITCH** (1871-1919). A Russian writer and novelist (see Vol. I). The Russian Revolution evolved in a direction contrary to his aspirations, so he retired to a villa in Finland and wrote manifestoes against the excesses of the Bolsheviks. Ironically enough, these writings were used in the propaganda of the reactionary counter-revolutionists, whom Andréev hated as bitterly as he did the Bolsheviks. Aside from political writings, he published little after 1914, a play, *The Sorrows of Belgium*, being written in that year to celebrate the heroism of the Belgians against the invaders. It was produced in the United States and so were the earlier plays, *The Life of Man* (1917); *The Rape of the Sabine Women* (1922); *He Who Gets Slapped* (1922); and *Anathema* (1923).

**ANDRESS, JAMES MACE** (1881- ). An American psychologist and author of works on physical education, born at Chesaning, Mich., and educated at the Michigan State Normal College, the University of Chicago, Harvard University, and Clark University. He was instructor in history and education at Manchester (Ind.) College, 1906-07, head of the department of psychology and school hygiene at the State Normal School, Worcester, Mass., 1908-15, and head of the department of psychology and child study, Boston Normal School, 1915-23. He was special lecturer on educational psychology and on health education at various institutions, and in 1920 he was special agent of the Bureau of Education and taught at Chautauqua Institution, N. Y. He wrote: *Johann Gottfried Herder as an Educator* (1916); *Teaching Hygiene in the Grades* (1918); *Health Education in Rural Schools* (1919); *Rosy Cheeks and Strong Heart* (1920); *A Journey to Health Land* (1924); and *The Boys and Girls of Wake-up Town* (1924). He collaborated in the writing of *Suggestions for a Programme of Health Teaching in the Elementary Schools* (with M. C. Bragg; 1921); *Health and Success* (1925); *Health and Good Citizenship* (1925); and *The Sunshine School* (1927).

**ANDREW, A (BRAM) PLATT, JR.** (1873- ). An American economist and public official, born at La Porte, Ind. (see Vol. I). During the World War he served first with the French and later

with the American forces (1914-19) and organized and directed the American Field Service with the French Army. He received the Croix de Guerre and became a Chevalier of the French Legion of Honor in 1917, and received the Distinguished Service Medal of the United States in 1919. He was treasurer of the American Red Cross, 1910-12, and delegate to the international conference of the Red Cross in 1912. In September, 1921, he was elected, as a Republican, to fill a vacancy in the National House of Representatives for the Sixth Massachusetts District, and he was reelected in 1922, 1924, and 1926. He was a delegate of the American Legion to the congress held in Rome in 1925, and in Bucharest in 1927.

**ANDREWS, ARTHUR IRVING** (1878- ). An American historian and educator, born in Providence, R. I., and educated at Brown University, the University of Wisconsin, and Harvard University. He was an instructor in history at Simmons College, 1906-09, and successively assistant professor of history, associate professor, and professor of history and international law at Tufts College after 1909. He was professor of diplomacy at Charles University, Prague, in 1921. In 1927 he became professor of history at the University of Vermont. He has contributed to the *American Journal of International Law*, the *Historical Outlook*, the *American Historical Review*, and other periodicals.

**ANDREWS, AVERY DE LANO** (1864- ). An American lawyer, capitalist, and soldier, born in Massena, N. Y. He was graduated from the United States Military Academy in 1886, received his law education at George Washington University and the New York Law School and was admitted to the New York Bar in 1891. He soon attained prominence as a corporation lawyer, and played an important part in the activities of large industries. He was an officer or director of the General Asphalt Company, the Uintah Railway Company, the Mexican Eagle Petroleum Company, and several banks. He was police commissioner of New York City, 1895-98, a staff officer in the Spanish-American War and saw service in France (November, 1917-May, 1919), as a staff member attached to General Headquarters. In 1918 he was made a brigadier general. The United States, France, Belgium, and Italy decorated him.

**ANDREWS, CHARLES MCLEAN** (1863- ). An American historian and college professor, born at Wethersfield, Conn. (see Vol. I). Professor Andrews continued his work in the interpretation of colonial institutions in his *Boston Merchants and the Nonimportation Movement* (1917), *Fathers of New England* (1919), and *Colonial Folkways* (1919), books of particular importance. The last named, written for the *Chronicles of America* series, is a kindly and understanding study and constitutes a real contribution to American belles lettres. In 1921 he edited with his wife *The Journal of a Lady of Quality* and in 1923, with Mrs. E. P. Trowbridge, *Old Houses of Connecticut*. In 1924 he published *The Colonial Background of the American Revolution* and in 1928 he was a contributor to the *Cambridge History of the British Empire*.

**ANDREWS, CHARLTON** (1878- ). An American author and educator, born at Connersville, Ind., and educated at De Pauw University and Harvard. He did newspaper work at Paris, France, and Indianapolis, Ind., and was on the

editorial staff of the New York *Tribune* (1914). He taught at New York University, Brooklyn Polytechnic Institute (1914-17), and Stuyvesant High School, New York City (1915-21). He has contributed to many magazines and is the author of *A Parfit Gentil Knight* (1901); *The Interrupted Revels* (1910); *The Drama To-day* (1913); *His Majesty the Fool* (a play, produced by the Little Theatre, Philadelphia, (1913); *The Technique of Play Writing* (1915); *The Torches* (a play from the French), 1917; *Ladies' Night* (written in collaboration), 1920. He also adapted *Bluebeard's Eighth Wife* (a play) from the French in 1921, *The Dollar Daddy* from the Hungarian in 1922, and *Sam Abramovitch* from the French in 1926. His later works are *The Lady of Gestures* (1926); *Get Me in the Movies* (1927); and *The Golden Age*, in collaboration (1928).

**ANDREWS, FANNIE FERN (PHILLIPS)** (1867- ). An American lecturer, social worker, and writer, born at Margaretville, N. S., and educated at the Salem (Mass.) Normal School, Radcliffe College, and Harvard Summer School. She is known as a lecturer on education in Europe and America, as secretary and organizer of the American School Citizenship League, and as a member of the advisory council of the Institute of International Education and the International Peace Bureau (Berne, Switzerland), the American Academy of Political and Social Science, and many other societies. She was a delegate to the International Conference on Education in 1914, and represented the United States Bureau of Education at Paris during the Peace Conference. Her works include *The War—What Should Be Said about it in the Schools?* (Boston, 1914), *Central Organization for a Durable Peace* (Boston, 1916), *Freedom of the Seas* (The Hague, 1917), *The United States and the World* (1918), *The World Family* (in a course in citizenship and patriotism), (1918), *A Course in Foreign Relations*, prepared for the Army Education Commission (Paris, 1919), and *The Mandatory System After the World War* (a thesis, 1923). She was also editor of an *American Citizenship Course in United States History* (5 vols.). In 1925 she made an extended tour of Egypt and the Near East to study the system of mandates.

**ANDREWS, FRANK** (1872- ). An American statistician, born at New Albany, Ind. He graduated from Johns Hopkins University in 1893 and took post-graduate courses in economics in that university. Until 1900 he was a teacher in the public schools of Maryland and Pennsylvania and in 1902-03 was employed in the United States Navy Department. From 1903 to 1914, he was assistant at the bureau of statistics maintained by the U. S. Department of Agriculture, and from 1914 to 1921, chief of the division of crop records of this bureau. In 1921-22 he was chief of the division of statistics and historical research; in 1922-24 regional live-stock statistician at Denver, Colo., and after 1924 agricultural statistician for Utah and Nevada. All of these offices were in the U. S. Department of Agriculture. From 1915 to 1921 he was a member of the United States Crop Reporting Board. He wrote bulletins on the marketing of crops, statistics of sugar, and other subjects.

**ANDREWS, IRENE OSGOOD** (Mrs. JOHN B. ANDREWS) (1879- ). An American writer on problems of women in industry. She was born at Big Rapids, Mich., and was educated at the School of Philanthropy in New York and the

University of Wisconsin. She began her career as agent for the Associated Charities at Minneapolis, Minn., and in 1906 was appointed special agent for relief work of the American Red Cross at San Francisco. In the same year, she was a factory inspector in Wisconsin. She was head resident of the Northwestern University Settlement, Chicago, in 1907. She became assistant secretary of the American Association for Labor Legislation in 1908 and was a member of the Young Women's Christian Association National Industrial Commission to Europe in 1910. She was married to John Bertram Andrews, economist, in 1910. (See ANDREWS, JOHN BERTRAM). She is the author of *Minimum Wage Legislation, Working Women in Tanneries, Irregular Employment and the Living Wage for Women, The Economic Effects of the War upon Women and Children in Great Britain* (Oxford, 1918, 1921; reprinted by the Carnegie Endowment for International Peace, Washington, D. C.), and of contributions to the *American Labor Legislation Review*, of which her husband is founder and editor.

**ANDREWS, JOHN BERTRAM** (1880- ). An American economist, born at South Wayne, Wis. He was educated at the University of Wisconsin and Dartmouth College. After teaching economics at both of these institutions, he became secretary and member of the executive committee of the American Association for Labor Legislation in 1909. He founded in 1911, and continued to edit, the *American Labor Legislation Review* (a quarterly), for recording advances in social reform. As an authority on the problems of unemployment, he served as a member of the New York Mayor's committee on unemployment, 1913-14, and in 1921 he was called upon by President Harding to become a member of the Federal Unemployment Conference. He was a member of the secretariat of the League of Nations' first official International Labor Conference in Washington, D. C., in 1921. His other activities included health conservation work and industrial research. He held memberships in the American Economic Association, the American Public Health Association and the American Sociological Society. With Prof. John R. Commons, he wrote *Principles of Labor Legislation* (1916) and *History of Labor in the United States* (1918). He wrote also *Labor Problems and Labor Legislation* (1922), and United States government reports on occupational diseases, etc., and was associate editor of *Documentary History of American Industrial Society* (1910).

**ANDREWS, LINCOLN CLARK** (1867- ). An American army officer and public official. He was born at Owatonna, Minn., studied at Cornell University, and was graduated at West Point in 1893. He served in the Spanish-American War and later in the Philippines, where he was made governor of the Island of Leyte. Later, he was instructor in cavalry tactics at West Point for three years, saw two years of duty in Cuba, and returned to act as inspector and instructor of cavalry for the National Guard of New York (1911-15). He was again on duty in the Philippines (1916-17), but after the United States entered the World War, he was made commander of the 172d Infantry Brigade of the 86th Division at Camp Grant, Ill., and took that brigade to France (August 1918). He was retired from active service at his own request in 1919, hav-

ing reached the rank of brigadier general. He was chief executive of the New York Transit Commission (1921-23) and from April, 1925, to August, 1927, was Assistant Secretary of the U. S. Treasury in charge of prohibition enforcement. In that capacity, he negotiated with the British government for the curbing of liquor imports. He is the author of *Basic Course for Cavalry* (1914); *Fundamentals of Military Service* (1916); *Leadership and Military Training* (1918); and *Man Power* (1921).

**ANDREWS, ROY CHAPMAN** (1884- ). An American naturalist, explorer, and author, chief of the division of Asiatic exploration of the American Museum of Natural History, New York City. He was born at Beloit, Wis., and was educated at Beloit College (1906) and Columbia University (1913). He made explorations in Alaska in 1908, and was a special naturalist (1909-10) aboard the U. S. S. *Albatross* on her voyage to the Dutch East Indies, Borneo, and Celebes. He explored northern Korea in 1911-12, and in the following year was again in Alaska, with the Borden expedition. Until 1914 Mr. Andrews specialized in the study of whales and other aquatic mammals. Two years later he headed the first of the Asiatic expeditions of the American Museum of Natural History which produced important and fruitful results in the discovery of evidence of very early animal and human life in Central Asia. The first expedition (1916 and 1917) was to Tibet, southwest China and Burma; the second (1919-20) was to northern China and outer Mongolia; the third (1921-24), to Central Asia, and the fourth, in 1927 and 1928, to the Gobi Desert region. The third expedition reported the discovery of the remains of the oldest known mammals and numerous evidences of very ancient human life, also geological strata previously undiscovered, with some of the richest fields of fossils ever found. Among the finds which attracted the notice of the entire world, lay and scientific, were fossil eggs of the dinosaur and the skull and parts of the skeleton of the baluchitherium, the largest known animal up to that time. The expedition which started in 1927 reported the unearthing of animal remains still huger than those of the baluchitherium, and other fossils of interest and importance. Among the incidental results of the Andrews expeditions was the opening of the Gobi Desert to the use of motor cars for commercial purposes. Dr. Andrews received the honorary degree of D.Sc. from Brown University in 1926. In 1918 he was in the intelligence service in China. He wrote: (with Hermann von W. Schulte), *The California Gray Whale* (1914); *Whale Hunting With Gun and Camera* (Chicago, 1916); *The Sei Whale* (1916); (with Mrs. Yvette Borup Andrews) *Camps and Trails in China* (Chicago, 1918); *Across Mongolian Plains* (Chicago, 1921), and *On the Trail of Ancient Man* (1926). *The California Gray Whale* and *The Sei Whale* are publications of the American Museum of Natural History.

**ANET, CLAUDE** (1868- ). The pseudonym of Jean Schopfer, a French novelist and essayist, born in Morges, Switzerland. His novel *Quand la terre trembla* (1921, tr. 1927), was a good naturalistic reproduction of the people's emotions during the Russian Revolution. His other works include *Voyage idéal en Italie* (1899); *Petite Ville* (1901) and *Les Bergeries* (1904), novels of the French provinces; *Les roses*

*d'Ispahan*, an automobile trip in Persia (1906); *Les 144 quatrains d'Omar Khayyâm* (1914); *La révolution russe* (4 vols., 1917-19); *Ariane, jeune fille russe* (1920, tr. 1927); *L'Amour en Russie* (1922); *Mademoiselle Bourrat* (1923) and *La fille perdue* (1924), plays; *Feuilles persanes* (1924); *La fin d'un monde* (1925); and *Suzanne Lenglen* (1927).

**ANGELL, JAMES ROWLAND** (1869- ). An American psychologist and educator, born at Burlington, Vt. (see VOL. I). He was the Sorbonne exchange lecturer for 1915. On America's entry into the War, he became a member of the psychology committee of the National Research Council and was assigned by the adjutant general's office to the work of classification of personnel in the Army. He was a member of the advisory committee on education and special training, in 1918, and chairman of the National Research Council (1919-1920). In 1920 he became president of the Carnegie Corporation and in 1921 he was chosen president of Yale University. A fourth edition of *Psychology* was published in 1908 and in 1918 *An Introduction to Psychology*.

**ANGELL, NORMAN** (1874- ). An English author and lecturer, son of the late Thomas Angell Lane (see VOL. XIII under LANE, RALPH NORMAN ANGELL). In 1929 he was elected to Parliament as a Labor member. Among his later writings are *The Dangers of Half-Preparedness* (1916); *Why Freedom Matters* (1916); *War Aims* (1917); *The Political Conditions of Allied Success* (1918); *The British Revolution and the American Democracy* (1919); *The Economic Chaos and the Peace Treaty* (1919); *The Fruits of Victory* (1921); *If Britain is to Live* (1923); *Foreign Policy and Our Daily Bread* (1925); *Human Nature and the Peace Problem* (1925); *Must Britains Travel the Moscow Road?* (with special reference to Trotsky's *Where is Britain Going?*, 1926); *The Public Mind: its disorders, its exploitation* (1927), and *The Money Game* (1928).

**ANGINA PECTORIS.** Not a little has been learned of this condition since 1914. It is not infrequently a consequence of remote syphilis and of imperfect treatment of the latter in its early stages. While it bears all the earmarks of a degenerative and destructive affection, it has been found amenable, even when well advanced, to the operation of division of the sympathetic nerve. Although this operation is not new, it has had a tremendous increase in the past few years and some individual operators have performed it scores of times. Marked differences of opinion have arisen as to technic and opinion is divided as to whether this intervention is an unqualified advance in treatment or only a palliative which is at the same time capable of as much harm as good. The subject was discussed in full in a paper which appears in the *Journal of the American Medical Association* for June 26, 1926. Two surgeons, Cutler and Fine, were optimists who believe that the operation has come to stay, although time will be required to establish general rules for intervention. McNealey, on the other hand, believed that the operation is wrong both from the theoretical and practical angles, the same criticism applying to all surgery which seeks to cure disease by division of the sympathetic nerves. Dr. Coffey of Oregon who had operated on 35 cases had had no death either from the disease or operation and had obtained relief in every

case. There seems no doubt that much relief may be obtained from surgery in a certain type of case, while only years of close observation can decide as to the quality of the end results.

**ANGLICAN CHURCH.** See ENGLAND, CHURCH OF.

**ANGLIN, MARGARET (MARY)** (1876- ). An American actress, born in Ottawa, Ont. (see VOL. I). In recent years, her appearances in Greek tragedies and in the plays of Shakespeare have been accorded high praise by the critics and have been well received by the public, although it is held by some writers on the theatre that her most distinctive gift is for high comedy, as in *Lady Windermere's Fan*, in which she played in the season of 1914. In the preceding year, she had presented the *Elektra* by Sophocles, in the Greek Theatre at Berkeley, Cal., followed by a series of Shakespearean representations, also in 1913. In 1915 she returned to Berkeley with *Iphigenia in Aulis*, by Sophocles, and the *Medea* of Euripides. *The Woman in Bronze* (1919) and *The Great Lady Dedlock*, a dramatization of Dickens' *Bleak House* (1923-24), preceded a lengthy tour (1924-25) and in the latter year she opened the outdoor Garden Theatre, in St. Louis, Mo., with *Elektra*. In 1926 she toured to California and Honolulu, playing *Elektra* again in Berkeley. She appeared in *Elektra* at the Metropolitan Opera House, New York City, in 1927. The same year, she was awarded the Laetare Medal by the University of Notre Dame.

**ANGLO-JAPANESE ALLIANCE.** On Jan. 30, 1902, England and Japan concluded an alliance whereby the two powers, "actuated solely by a desire to maintain the status quo and general peace in the extreme East," recognized the independence and territorial integrity of China and Korea and bound themselves to come to the assistance of each other in case more than one power joined in hostilities against either one. On Aug. 12, 1905, the treaty was renewed in a revised form, inasmuch as it provided that war with one power was to be sufficient cause for common action. The changes in the Far East, particularly the annexation of Korea by Japan, brought again a renewal and revision of the treaty in 1911. While the objects of the new pact were essentially the same as those of the treaty of 1905, an additional article was adopted which read, "Should either of the high contracting parties conclude a treaty of general arbitration with a third power, it is agreed that nothing in this agreement shall impose on such contracting party an obligation to go to war with the power with whom such an arbitration treaty is in force." This was inserted to exclude the United States from the list of powers with whom Great Britain might find herself at war as a result of the treaty.

The Anglo-Japanese Alliance had originally been formed against Russia, and it had been a factor in bringing about the Russo-Japanese War and Russia's defeat. After 1907, when an understanding had been reached by Great Britain and Japan on one side and Russia on the other, Germany became the potential enemy, and a direct result of these developments was the withdrawal of the British squadron from the Far Eastern waters to the North Sea. When the War broke out, Japan declared war on Germany "in accordance with the terms of the Anglo-Japanese Alliance." While outwardly fulfilling her treaty obligations arising out of the Al-

liance, Japan in reality used the Alliance as a screen behind which she furthered her own aims in the Far East. The preoccupation of the Allies gave her a free hand. Occasional representations and protests from the Allies were of no avail. Primarily as a result of the Anglo-Japanese Alliance, the conclusion of the War found Japan, with the connivance of Great Britain, in a powerful position, from which she receded only after the Peace Conference.

In 1914 Great Britain and the United States signed the Peace Commission Treaty, which, strictly speaking, was not an arbitration treaty. Nevertheless, Sir Edward Grey, the English Foreign Secretary, notified the Japanese government that the British government would regard the treaty as a "general arbitration treaty" within the meaning of the exemption clause of the Alliance. The fact that this notification was kept secret until 1921 served to strengthen the impression that the Alliance would operate against any power whatsoever and thus worked materially to the benefit of Japan. After Japan had eliminated in succession, by means of the Anglo-Japanese Alliance, Russia and Germany as competing powers in the Far East, the most serious obstacle to Japanese power in the Eastern Pacific was the growing ascendancy of the United States. Aside from the question of Japanese immigration in Western Pacific territories, which was in itself serious enough, Japanese and American interests came more and more into conflict in the Far East. For example, the United States stood for the "Open Door" in China, while Japan was the strongest protagonist of the policy of zones of interest in that country. It had been made clear to Japan that the Anglo-Japanese Alliance would not operate in case of a clash between Japan and the United States. Hence, there appeared in Japan signs of coldness toward a continuation of the treaty with England. It was no mere coincidence that in 1916, simultaneously with vigorous demands in the Japanese press for abrogation of the Alliance, the Japanese government concluded a secret treaty with Russia for coöperation in the Far East, which would have superseded the pact with England had not the Russian Revolution occurred. (See JAPAN AND SIBERIA AND THE FAR EASTERN REPUBLIC.) Japan, thrown back on the Anglo-Japanese Alliance for the time being, concluded thereupon in 1917 the Lansing-Ishii Agreement, whereby she obtained liberty of action in China, at least for the duration of the War. See JAPAN.

The period following on the Peace Conference witnessed further accord between Great Britain and the United States, and the two powers began more and more to coöperate in all the main issues of world affairs. At the same time, the points of conflict between Japan and the United States grew sharper. Japan was compelled under pressure from the Powers to forego a large part of her position on the Far Eastern mainland and, *nolens volens*, had to accept the Open Door policy in China. It became evident, moreover, that no full accord or alliance between Great Britain and the United States was possible while the Anglo-Japanese Alliance was in existence. As a matter of fact, the Alliance had outlived its usefulness, since Japan would not be able to count on British assistance against her only possible rival. Hence, demands were made in the press of both countries for the discontinuation of the treaty. When, therefore,

after the lapse of the 10-year term, the renewal of the Alliance came up for consideration in July, 1920, it was decided in accordance with the clause contained in the text of the 1911 treaty to let the Alliance run for another year. Meanwhile, Great Britain desired to consult the Dominions, whose attitude toward Japan was akin to that of the United States. At the same time, Great Britain and Japan discovered that the text of the 1911 treaty was "inconsistent" with the Covenant of the League of Nations and in a note apprised the League of this fact, promising that on the renewal of the treaty this inconsistency would be remedied. When, after the lapse of the year, no agreement had been reached as to a proper basis for renewal, the treaty was declared by mutual agreement in July, 1921, to remain in force for three months, and the League was informed that this automatic extension conflicted in no way with the note to the League of the preceding year. At the end of the stipulated three months, the Washington Conference (See WASHINGTON CONFERENCE) convened (November, 1921) and there treaties and agreements were concluded in consequence of which the Anglo-Japanese Alliance became completely obsolete. The Alliance was allowed to lapse in consequence of the Four Power Treaty. The Lansing-Ishii Agreement was superseded by the Nine Power Treaty of the Open Door in China. What actually took place was that Great Britain and the United States reached a complete accord as to the chief issues in the Pacific and that Japan, under pressure from the two English-speaking powers, had to make concessions and forego her liberty of action in the Far East. The British change of front from the Anglo-Japanese Alliance to coöperation with the United States had become a fact. In consequence of these events and of the American immigration legislation in 1924, Japan subsequently pursued a policy which indicated a desire to reach an agreement with Soviet Russia on Far Eastern questions, similar to that concluded with Imperial Russia in 1916.

**ANGOLA**, (ân-gô'lá) or **PORTUGUESE WEST AFRICA**. A Portuguese colony situated on the West coast of Africa, bounded on the north and east by the Belgian Congo, and on the south and east by Rhodesia and the Union of South Africa. It presents a coast-line of 1000 miles to the Atlantic and has an estimated area of 484,800 square miles. In 1920 the population was placed at 5,000,000, including 31,000 whites. The natives are of Bantu-Negro stock. Loanda, the capital, situated on the coast, has an estimated population of 18,000. Other important towns are Cabinda, Ambriz, Novo Ridondo, Benguela, Mossamades, and Port Alexander. The chief products are coffee, rubber, wax, sugar, vegetable oils, cocoanuts, ivory, oxen, fish, and whale oil. The rubber industry steadily declined, with the result that the Government applied itself to the encouragement of cotton and sugar-cane culture. The colony contains considerable quantities of copper, iron, petroleum, salt, and some gold, none of which was worked extensively. The trade, largely with Portugal and carried in Portuguese bottoms, consists of imported textiles and exported rubber, coffee, dried fish, and whale oil. In 1920 these totaled 225,569,000-escudos for imports and 233,638,000 escudos for exports. Communications were, of course, still in a primitive state. There are 818 miles of railway, 375 miles of which were pur-



chased by the Portuguese Government in 1918. There are 2420 miles of roads and 7452 miles of telegraph lines. The removal of Germany from Africa as a result of the War left British influence dominant. Rivalry between British and German interests had been keen for the gaining of economic concessions and the Germans had been particularly active in southern Angola. German agents recruited native workers for transportation to the Otavi copper mines in German territory and thus gained the enmity of the Portuguese. During the War, border conflicts took place between German and Portuguese forces.

**ANGORA GOVERNMENT.** See TURKEY.

**ANIMAL PSYCHOLOGY.** In 1914 animal psychology was just emerging from the anecdotal stage and was fighting for the right to be regarded as a legitimate branch of experimental psychology. This right 10 years later had been achieved through the perfection of objective methods of control. Indeed, the technique of animal psychology, necessitating the study of external behavior without regard to states of consciousness, has had a powerful repercussion on psychology proper (see BEHAVIORISM). The greatest amount of experimenting was done on learning and habit formation, with white rats learning to pick their way in a maze, or to choose the proper exit from an enclosure from two or more alternatives. The topics treated included learning ability, distribution of effort, retention of motor habits, the relative influence of such factors as repetition, reward and punishment, primacy and recency of experience, and transfer of training.

As a result of these investigations, the long established laws of learning have been subjected to fresh criticism and to renewed experimental attack. The theory of the conditioned reflex formulated by the Russians, Bechterev and Pavlov, has been greatly elaborated and extended. That certain reflexes, such as the salivating reflex in the case of dogs, can be made to function by conditions habitually associated with the adequate stimulus, has been definitely established. More recently (see Pavlov, *Conditioned Reflexes*, 1927) emotional disturbances in animals, akin to the neuroses in human beings, have been generated by a process of inhibiting and of building chains of conditioned reflexes.

Two other fruitful subjects of research were the study of tropisms and instincts among the lowest animals and the higher mental processes among animals most closely resembling man. The first seems by its nature to favor a mechanistic explanation and the second a conscious explanation. Jacques Loeb, in his two works, *The Organism*, considered as a whole from the physico-chemical standpoint, and *Tropisms*, forced movements and animal conduct, attempted to extend the physico-chemical explanation to the entire animal kingdom, man included. However, experiments with the lowly amoeba revealed an unexpected degree of complexity even in the movements of unicellular animals. Kepner and Edwards (*Journal of Experimental Zoology*, 1917, vol. xxiv, p. 381) find that the *Amoeba pelamys* has two types of feeding reactions, one to non-moving objects which have no possibility of escape, the other to objects in motion, which may escape. Schaeffer (*Journal of Animal Behavior*, 1917, vol. vii, p. 220) points out that the ordinary amoeba can choose between digestible and non-digestible particles. He regards the

movement of the particle as the most important condition of the feeding reaction. Glass particles are eaten if they are in motion but not otherwise. Numerous experiments with light waves led to no important conclusion as to the behavior of the lower animals, inasmuch as the light stimulus produces immediate reactions from the higher animals and from man.

The mental life of primates, particularly their modes of reacting to new situations, has been studied by Wolfgang Koehler (*The Mentality of Apes*, 1925), Robert M. Yerkes (*Almost Human*, 1925, and *Chimpanzee Intelligence and its Vocal Expressions*, 1925), and others. The former, interested particularly in Gestalt psychology, has found evidence in the primates of a form of insight closely akin to reasoning in man. This factor of insight, a direct adaptation of means to ends, he believes should be given a position of equal importance with the so-called "trial and error" learning theory put forward by E. L. Thorndike some years earlier.

One of the most recent developments in animal research grows out of dynamic psychology, namely, the determination of animal motives or "drives" as they are called, and their relative strength. F. A. Moss, C. J. Warden, and C. P. Stone have investigated the strength of the sex, hunger, maternal, and comfort drives, and still other forms of motivation are in the process of measurement. The most common technique consists in measuring the extent to which an animal will traverse an unpleasant obstacle in order to satisfy the "drive." Consult *Journal of Animal Behavior*, *Behavior Monographs*, *Journal of Comparative Psychology*, and *Comparative Psychology Monographs*.

**Bibliography.** Most of the discussion of animal psychology is scattered through the psychological and biological periodicals. Washburn's *The Animal Mind* continues as the standard textbook on the subject. For a popular exposition of animal psychology, consult the first section of McDougall's *Outline of Psychology*, and Hunter's *General Psychology*. A brief historical survey of animal psychology will be found in C. J. Warden's, *A Short Outline of Comparative Psychology*.

**ANISFELD, BORIS ISRAELEVICH** (1879- ). A Russian painter and scenic decorator who was born at Bieltsy, Bessarabia, and received his artistic training at the Qdessa Art School and the Academy of Petrograd. A series of South Russian landscapes brought his first artistic triumph at Petrograd and Paris in 1905. The same season saw his first scenic production, the "Marriage of Zobeide," which in its daring color schemes and original conception was epoch-making in Russian scenic art. It attracted the attention of Diaghilev, who employed him on the Russian ballet. (See PAINTING, under Russia.) Among other scenic triumphs were "Boris Godounov" (1908), "Ivan the Terrible" (1909), "Sadko" (1911), "Islamey," "The Preludes," "Egyptian Nights," and "La Reine Fiammette" (New York, 1918). He was primarily a colorist, but he subordinated color and all else to constructive synthesis. Among his best known canvases are "Clouds on the Black Sea," "Alder Grove—Iver," and "Gray Day on the Neva"—landscapes; a series of still life; "The Blue Statue," "The Exodus," "Garden of Eden," "The Golden God," "Garden of the Hesperides," "Buddha and the Pomegranates." His portraits include several of himself, the singer Chaliapin





*Conscience and Concessions* (1918); and *The Church in the Community* (1919). He also edited *Preachers and Preaching* (1900); *New Wine Skins* (1901); *Safeguarding Funds* (1925); *Cooperation in Fiduciary Service* (1927); and *Annuity Agreements of Charitable Organizations* (1927).

**ANTHONY, KATHERINE SUSAN** (1877- ). An American writer on feminism, born at Roseville, Ark., and educated at Peabody College for Teachers, Nashville, Tenn., the Universities of Heidelberg and Freiburg, Germany, and the University of Chicago. She was an instructor in Wellesley College (1907-8) and did research work in economics for the Russell Sage Foundation, New York (1909-13). She is author of *Mothers Who Must Earn* (1914); *Feminism in Germany and Scandinavia* (1915); *Labor Laws of New York* (1917); *Margaret Fuller—a Psychological Biography* (1920). She was author of the essay "The Family," in *Civilization in the United States—an Inquiry by Thirty Americans* (1921), co-author of *Catherine the Great* (1925), and editor of *The Endowment of Motherhood* (1920). In 1927 she translated the *Memoirs of Catherine the Great*.

**ANTHERACITE.** See COAL.

**ANTHRAX.** This communicable disease, in the form known as malignant pustule or malignant carbuncle, came much before the public because of its transmission through infected horsehair shaving brushes. Ordinarily, it is an occupational disease which occurs in workers in rawhide, wool, horsehair, bristles, etc. Numerous cases have been reported in both horsehair workers and tanners on the one hand and among the general public on the other, as a result of infection from the use of horsehair shaving brushes. As a consequence of these infections, the Health Department of Pennsylvania issued a ruling that all horsehair should be subjected to dry heat for 24 hours at 200° F., or for 2 hours to steam at 15 pounds pressure, and finally to continual boiling in water for 3 hours. The public has been repeatedly warned by health authorities against the use of cheap shaving brushes, but this warning is insufficient for the protection of the community; and in New York State, a law was passed which became effective on Jan. 1, 1922, prohibiting the manufacture, sale, and offering for sale of shaving brushes made of horsehair. The general decline in the use of the shaving brush in recent years must be set down as due in part to the possibility of contamination. In the larger exposed industries, as tanneries, the men are notably indifferent toward self-protection, and only a small proportion are directly exposed to contagion. Statistics have shown that about 10 per cent of those exposed will contract the disease, with a mortality of about 20 per cent. Some 119 workers in the Pennsylvania tanneries were infected during a period of 12 years.

**ANTHROPOLOGY.** Coördinate progress has been made in recent years in the several departments that comprise anthropology. The principal feature common to their growth has been the stressing of the historical view of man's development. Few anthropologists other than conservatives of the older generation now maintain that men developed in much the same fashion in all parts of the world. In place of this classical evolutionary or parallelist view, they seek to unravel the specific history of each group of mankind. There also has been a shift beyond this,

from a purely mechanical or objective statement of man's cultural and racial history to an analysis of the psychic and biologic factors involved in his development.

Ethnographic research has grown until there is now no important section of the primitive world unknown. At the opening of the era, the native cultures of Polynesia and South America were little known: systematic descriptions are now available from both areas, and our knowledge of North America and Africa has been considerably improved. On the other hand, little data has been added from Australia or other Oceanic areas, and from Siberia. See ETHNOGRAPHY.

Ethnologic inquiry has moved to the analysis of this material in two ways. Historical schemes on a world scale have been posited which put primary emphasis on diffusion or spread of civilization from certain early centres. Elliot Smith (England) maintains that all significant arts are derived from Egypt; Graebner and Schmidt (Germany-Austria) offer a pluralistic origin of types of civilization, the forms of which have variously combined over the world; Kroeber (United States), while maintaining that single elements diffused independently of each other, inclines to consider the ancient centres of the eastern Mediterranean, India, China, and Central America as playing the predominant rôle as foci of influence. While such historical schematization was stressed at the opening of this era, there has been of late a return to an alternative type of analysis. Boas and most other Americans, although not devoid of historical interests, are concerned with the conditions under which cultural traits are formed. Analogous to this is the interest of Radcliffe Brown and Malinowski (Australia-England) in the functional interrelationship of traits. Their avowed aim is to discover general laws of cultural development, although avoiding the historical approach. See ETNOLOGY.

Anthropologists are also concerned with the biological history of men. While essentially a zoological problem, they are forced to deal with it because the zoologists' approach is too general to provide a specific history of racial groups. Their two special problems are the history of racial types and the discrimination of heritable characters from the special forms acquired during the growth of the individual. Recent developments in this field serve to strengthen the fact of man's derivation from earlier ape-like forms. Several new attempts at race classification have been made and new analyses of local populations. Further evidence is now available to show the influence of environmental factors in forming local types. See MAN, PREHISTORIC RACES OF; INDIANS: RACE PROBLEMS IN THE UNITED STATES.

**PREHISTORY.** The essential outlines of European prehistory were laid down in the early decades of this century. Since the World War, there has been some readjustment in the European field to fit discoveries in adjacent lands and there has been exceptional activity in prehistoric research in all continents. The now traditional series of culture periods, Earlier and Later Stone Ages (Palæolithic and Neolithic), Bronze, Iron, and historic periods, are now known to apply properly to western Europe alone.

The earliest Palæolithic period (Eolithic) is still a somewhat hypothetical phase of middle or even early Pleistocene (Ice Age) times. Ober-

maier holds that the lower Palaeolithic phase (Chellean and Acheulean of France) reached Europe from the south and was lacking in central and eastern Europe. There, its place was taken by a synchronous Pre-Mousterian (*Das Paläolithikum und Epipaläolithikum Spaniens, Anthropos*, 1919-20). The following Mousterian period shows a remarkable uniformity of culture over Europe, Minor Asia and North Africa. This was followed by further differentiation on both sides of the Mediterranean. Spain followed North Africa; its Aurignacian being derived from North African Capsian, and lacking the succeeding Solutrean and Magdalenian periods of France. Of the transitional Palaeolithic-Neolithic cultures (Obermaier's Epipalaeolithic), the Terminal Capsian of southern Spain and northern Africa was ancestral to the Tardenoisian of France and influenced the Azilian; the French Campignian and Spanish Asturian are classed as Proto-Neolithic.

Beside the important consideration that the traditional series of Palaeolithic cultures of western Europe were not an outgrowth each from the preceding one, the fact that these periods were of unequal duration in various parts of the continent. G. de Geer fixes the end of the Palaeolithic in Scandinavia at 8700 years ago (*Ymer*, 1925, 1), although it is set at approximately double that antiquity on the Mediterranean. On the whole, cultural changes took place earlier in the south and east than in western Europe, the west and north being influenced from those directions. This cultural leadership of the Mediterranean persisted into historic times.

Outside of Europe, considerable evidence of Palaeolithic cultures has come to light since the War, but much of it is uncertain as to geological antiquity. The Upper Palaeolithic is recognized on the Yenisei (western Siberia) by G. von Merhart in the form of Aurignacian and Magdalenian cultures, but the intervening Solutrean is absent (*American Anthropologist*, 1923, 21). The Gobi Desert (Mongolia) contains remains of Mousterian and Aurignacian types derived from the Yenisei, and a Proto-Neolithic derived from some other source (N. C. Nelson, *Amer. Anth.*, 1926, 305; 1927, 177). The great bend of the Hwang-ho (Northern China) also contains those of Mousterian and of Aurignacian types (T. de Chardin), and southern China those of Mousterian or early Aurignacian industry (Licent and de Chardin, *L'Anthropologie*, 35, 201). Palaeolithic implements with Neolithic aspects are reported from Tonkin. It is noteworthy that all these cultures of northern and eastern Asia are of Upper Palaeolithic type (Mousterian or later). Earlier types have long been known from India. Upper Palaeolithic finds have now been made in Ceylon by F. Sarasin (*L'Anthropologie*, 36, 75). Stone tools of Palaeolithic type have also been found in South Africa, but there too their geological position is uncertain. Stratification of Aurignacian over Chellean or Acheulean tools is reported from Rhodesia (*Jour. Royal Anthro. Inst.*, 54). On the other hand Australia and Oceania seem devoid of evidences of early occupation.

America has long been searched for such evidences, but all claims of high antiquity have been disproven or are doubtful. Three sites in North America investigated since the War have claim to consideration, however. At Trenton, N. J., L. Spier demonstrated the existence of a simple

culture of possibly terminal Pleistocene age (*Anth. Papers, Amer. Mus. Nat. Hist.*, 22, 167); at Frederick, Okla., are equivocal remains which O. P. Hay assigns to the first inter-glacial period (*Science*, 1928, 160, 371, 442, 184). The most reputable case thus far presented is a group of blades of unique type which were found with fossil bison bones at Folsom, N. M. Their age is fixed by B. Brown as terminal Pleistocene. A summary of these new extra-European finds reinforces the prevalent hypothesis that the earliest remains of man will be found in the heart of the Old World land-mass, while those of peripheral regions (Scandinavia, northern Asia, N. America) are all of more recent date.

While the succeeding Neolithic period is classically set off from Palaeolithic as profoundly different because of its lithic technique, G. Elliot Smith regards the division of Upper from Lower Palaeolithic as more fundamental (*Primitive Man*, 1916). A. L. Kroeber (*Anthropology*, 1923) has pointed out that stone-grinding as the primary criterion of Neolithic industry is misleading, since this art did not appear in Europe until a relatively late stage in this period. He suggests a better definition of early Neolithic in terms of the bow, pottery, and the dog. The Neolithic is furthermore the period in which agriculture, domestic animals, weaving, houses, villages, and monuments first appear, and, as such, foreshadows the beginnings of historic cultures. Neolithic remains have long been known throughout Europe, and in general living primitive peoples may be said to be on a Neolithic level. Specifically, Neolithic remains have recently been found in the Fayum of Egypt, Mesopotamia, Kenya (East Africa), South Africa, Mongolia, and northern China.

Increasing perspective gained by the finds of recent years has weaned many from the old doctrine that Egypt and Mesopotamia were in this period the cradles of all civilization. The clearer view is that of a series of foci of early development whose interrelations were quite intricate. Egypt and Mesopotamia were but two among many such which stretched northward and eastward quite to India and China. The older view was founded in part on the assumption that agriculture, a necessity to the rearing of large social fabrics, was first practiced in these great river valleys. On botanical grounds, N. Vavilov deduces that our cereals are derived rather from mountainous districts between Abyssinia and Afghanistan (*Studies on the Origin of Cultivated Plants*, Leningrad, 1926).

No revolutionary changes have been made in recent years in our conception of the Bronze and Iron periods, during which the historic nations emerged. It is increasingly clear that metal working in bronze and traits appearing at much the same time, such as the wheel, wheel-made pottery, and writing, had their origins in or near the Near East and spread to the margins of the Old World land-mass, but not beyond. Iron, although in general use in the Near East much later than the earliest bronzes, spread more rapidly, outstripping bronze in Negro Africa and in India, reaching Japan via southern Siberia about as early as bronze. It follows that there were no equivalents of these metal-using eras in Australia, Oceania, and the two Americas. Great stress is laid on the cultural unity of widely separated areas during these periods by such students as B. Laufer, who insists

on an old and continuing connection of China with the Near East ("Some Fundamental Ideas of Chinese Culture," *Jour. Race Development*, 5; *Sino-Iranica*, 1919).

**Bibliography.** A simple outline of prehistory and its relation to present-day primitive cultures is A. L. Kroeber's *Anthropology* (1923). G. G. Mac Curdy's *Human Origins* (1924) is the best reference work available in English; M. Ebert's *Reallexikon der Vorgeschichte*, still in the process of appearing, is of encyclopædic range. R. A. S. Macalister's systematic *Textbook of European Archaeology* (1921) and M. C. Burkitt's *Prehistory* (1921) supplant Osborn, Sollas, etc. V. G. Childe's *Dawn of European Civilization* (1925) is an excellent summary of post-Paleolithic cultures. See **ETHNOGRAPHY**; **ETHNOLOGY**; **EUGENICS**; **MAN**, **PREHISTORIC RACES OF**.

**ANTHROPOMETRY.** See **ANTHROPOLOGY**.

**ANTI-AIRCRAFT ARTILLERY.** See **ARTILLERY**.

**ANTI-AIRCRAFT GUNS.** See **SMALL ARMS**.

**ANTIBODIES.** See **HEREDITY**.

**ANTIN, MARY** (MARY ANTIN GRABAU) (1881- ). An American writer on the immigrant. She was born at Polotzk, Russia, went to America in 1894, and was educated in the public schools and the Girls' Latin School of Boston, Teachers College (Columbia University), and Barnard College. Her books, especially *The Promised Land* (Boston, 1912) and *They Who Knock at Our Gates* (Boston, 1914), made an instant and deep impression by their sincerity, their idealism, and the vividness with which she showed, from her own experience, what America means to the immigrant. Her other works are *From Polotzk to Boston* (Boston, 1899); *At School in the Promised Land* (selections from *The Promised Land*, Boston, 1918), and *The Lie* (Boston, 1919).

**ANTIOCH COLLEGE.** A non-sectarian, co-educational institution at Yellow Springs, Ohio, founded by Horace Mann in 1853. The student enrollment increased from 230 in 1913 to 649 in 1928-29; the faculty from 20 to 69 members; and the library from 12,000 to 29,000 volumes. In the autumn of 1921, the college was completely reorganized in order to determine what were the controlling demands and opportunities of modern life and to furnish in a single orderly programme those elements of discipline and training which would best prepare students for all the relationships of life: personal, social, and vocational. In pursuance of this plan, the college united, in a single coördinated course of six years, a liberal college education, guidance in the choice of a profession or other calling and training for it, and a practical apprenticeship to life through part-time practical work. Students were not accepted who desired to confine themselves solely to technical training. The purpose of the programme as established was primarily to develop self-reliance and responsibility and to give the student first-hand acquaintance with practical life and his own powers. The part-time work also helped him to discover and prepare for his calling and more than cut in two the cost of a college education. Half the students studied while the other half worked, in alternate periods of five weeks. More than a hundred firms cooperated with the college in this programme. The enrollment was limited, and very close relations were maintained between students and faculty. The professional and other vocational courses prepared for engineer-

ing, business administration, education, journalism, and institutional management with emphasis on administrative and managerial training, rather than on specialized technique. Arthur E. Morgan, D.Sc., succeeded A. D. Fess, L.L.D., as president in 1921.

**ANTI-SALOON LEAGUE OF AMERICA.** See **PROHIBITION**.

**ANTS.** See **ENTOMOLOGY**, **ECONOMIC**.

**ANTWERP** (Fr. *Anvers*). Belgium's first port and second largest city (see **VOL. I**), situated on the right bank of the Scheldt 53 miles from its mouth and where it is 380 to 650 yards wide. The population, excluding the suburbs, was 312,884 on Dec. 31, 1912; 322,857 on the same date in 1919; 333,882 in 1920; 304,124 in 1921; 300,321 in 1922; 300,677 in 1923; 302,159 in 1924; 300,026 in 1925; 300,175 in 1926, and 300,001 in 1927. On Nov. 11, 1923, the Colonial School at Antwerp, which was founded on Jan. 11, 1920, and the School of Tropical Medicine, were united to form the Colonial University. The old prison, le Steen, has been converted into a Museum of Antiquities, its collection including the instruments of torture which were formerly employed in the prison. The newly erected Chamber of Commerce has a unique interior, and the zoölogical gardens of Antwerp are considered among the finest in the world.

**Shipping.** Antwerp's ample road and canal network makes her the shipping centre of Belgium and western Germany. Her port, of which the facilities are being improved, has about 3½ miles of quays 100 yards wide, 20 docks, the largest being 1050 yards long and 150 yards wide, 16 of which are for maritime, and four for inland, shipping. There are seven city dry docks which repaired 452 ships in 1926. In 1913 the new North Docks for maritime trade were opened and by 1927 the quays of these docks were provided with sheds. During the World War, the city was inactive; at its close, the Belgian merchant fleet consisted of 193 ships, 186 of which were registered with Antwerp as their home port (Jan. 1, 1920). The net register tonnage of sea-going vessels entering the port was as follows: 14,146,819 in 1913; 10,858,926 in 1920; 12,980,874 in 1921; 15,050,182 in 1922; 17,349,098 in 1923; 19,302,534 in 1924; 20,161,834 in 1925; 22,794,896 in 1926; and 23,490,300 in 1927. The accompanying table shows the origin of the larger part of this shipping for 1925 and 1926:

Flag	1925		1926	
	No. of ships	N. R. T. *	No. of ships	N. R. T.
Belgian	866	1,276,219	914	1,409,286
British	4,249	7,555,576	5,257	9,275,719
Dutch	595	1,854,218	673	2,032,290
French	750	2,112,575	698	2,031,331
German	1,439	3,109,596	1,681	3,604,262
Norwegian	591	898,172	738	1,051,167
Swedish	421	452,016	432	525,747
United States of America	164	735,240	172	753,484

\* Net Register Tons

In 1926, 11,599 seagoing ships entered the port (9971 in 1925), the ten thousandth for the year entering on November 14, the first time that that number had ever been reached, and 11,612 ships cleared in 1926. Of river craft, 39,581 with a gauging tally of 11,003,700 tons entered in 1925, and 41,886 with a gauging tally of 12,027,129 entered in 1926.

**History.** On Aug. 17, 1914, King Albert and his government moved to Antwerp and three days later the Belgian Army had retreated to the extensive and very modern fortifications of that city. On Sept. 27, 1914, the siege of the city began, October 6 the Government sailed for Ostend, and on October 10 the city capitulated to the Germans, who occupied it until the close of hostilities. The old parts of the city were not damaged, the Germans having asked for and received a map of the city before starting the bombardment. On Nov. 19, 1918, the King and Queen made a state entry into Antwerp. The Olympic Games of 1920 were held there from August 14 to September 10. See OLYMPIC GAMES.

The hundredth anniversary of Belgium's independence was to be celebrated from April to October, 1930, by an international exposition held jointly at Antwerp and Liège, the Antwerp exposition being devoted to the colonies, shipping, agriculture, and Flemish art and the Liège exposition to the iron and steel industries, the sciences, and Walloon art.

**ANZACS.** See WORLD WAR.

**ANZIOLOTTI, M.** (1869- ). An Italian jurist, president of the Permanent Court of International Justice. He was educated at the University of Pisa and became professor of international law at the University of Palermo (1902), the University of Bologna (1904), and the University of Rome (1911), and a member of the Permanent Court of Arbitration in 1916. During the Paris Peace Conference, he served as legal adviser and technical representative on the Italian delegation. In 1920-21 he was Under-Secretary General to the League of Nations. He was appointed to the Permanent Court of International Justice in January, 1928. His principal work is *General Theory of the Responsibility of the State on International Law*.

**AOSTA, A-OS'tà, EMANUELE FILIBERTO, DUKE OF** (1869- ). An Italian general, son of Prince Amadeo of Savoy. He commanded the 1st Division at Turin and the 10th Army Corps at Naples. When the World War began, he was on the reserve list, but was appointed to command the 3rd Army and remained in that position till the end of the War. See WAR IN EUROPE, under *Italian Front*.

**APES, FOSSIL.** See MAN, PREHISTORIC RACES OF.

**APICULTURE.** See ENTOMOLOGY, ECONOMIC.

**APOLLINAIRE, GUILLAUME** (pseudonym of A. VON KOSTROWIECKI) (1880-1918). A French poet and novelist who represented the extreme modernist tendencies of *les jeunes*. As editor of *Le Festin d'Esopé* (1903-04) and *Les Soirées de Paris* (1913-18), he influenced both the younger school of French poetry and cubist painting, and hoped to develop an æsthetics which would unite poetry and painting into a single art. His prose works include *Antitradition futuriste*, an exposition of futurist theory; *L'Enchanteur Pourissant* (1903); *Le théâtre italien* (1910); *L'hérétarque et Compagnie* (1912), his prose masterpiece; *Les mamelles de Tirésias*, a realistic drama (1918); *La femme assise*, a posthumous novel; and two posthumous miscellanies, *Il y a* and *Anecdotes*. His poetry includes *Alcools* (1913), a collection of his more finished poems; *Le Poète Assassiné* (1918; tr. 1923) a lyric autobiography relating his impressions of the World War; and *Calligrammes* (1918), verses composed at the front. Consult *Souvenirs de mon commerce*, by André Louis Marie Rouveyre (1921).

**APPLETON, WILLIAM ARCHIBALD** (1859- ). A British Trade Union leader, born at Nottingham, England. He was a lace maker in Nottingham until 1896, when he became secretary of the Lace Makers' Trade Union. In 1907 he was elected secretary of the General Federation of Trade Unions of Great Britain, and during the World War, he was accepted as spokesman for British labor by the British government, although it was maintained that his organization was usurping the powers of the British Trade Union Congress and the Labor Party. Among his writings on industrial economic subjects are *Unemployment* (1923); *Trade Unionism* (1924); and *Trade Unions: Their Past, Present and Future* (1925).

**APPONYI, ÖPÖD-NYI, ALBERT, COUNT** (1846- ). Hungarian statesman (see Vol. I). He served in the Chamber of Deputies during the World War and was Minister of Education in the Esterhazy and Wekerle cabinets (1917), but retired in 1918 as a result of the October revolution. He represented his country at the Versailles and Trianon Peace Conferences. Later, he took his place in the Lower House of the newly constituted Hungarian Parliament, and was chosen speaker. He had a great influence on Hungarian policy. In 1923 he visited the United States at the invitation of the Institute of International Education. His later writings include *Austria-Hungary and the War* (1915); *The American Peace and Hungary* (1919); *Hungarian Foreign Policy* (1921); *Emlékirataim*, Hungarian politics from 1872 to 1922 (1922); *Memoirs* (vol. 1, 1922); *Apponyi emlékkönyv* (1926); *Die verfassungsrechtliche Entwicklung Ungarns*, speeches delivered in three Dutch universities (1927), and, with others, *Justice for Hungary* (1928).

**AQUEDUCTS.** See WATER SUPPLY.

**ARABIA.** A peninsula of southwestern Asia. The area is estimated at 1,000,000 square miles, the population, from 6,000,000 to 7,000,000. Because of the nomadic habits of the Bedouin tribes inhabiting the peninsula, accurate population figures are impossible. The settled communities are to be found in the oases of central Arabia and in the fertile districts along the coasts. The boundaries of the various principalities are ill-defined and the loyalties of the various tribesmen are equally tenuous. The political divisions in existence in 1929 were: (1) *The Kingdom of the Hedjaz and Nejd* which has an estimated area of 150,000 square miles and an estimated population of 900,000. It is the chief principal-ity of Arabia because of its possession of the holy cities of Mecca (population 70,000) and Medina (population 15,000). The capital is Mecca and the chief port Jeddah (population 25,000). The gathering of dates forms the leading activity of the natives; the more important imports are food stuffs and building materials. Through the heart of the kingdom runs the Hedjaz railway with its terminus at Medina (815 miles), and it was the possession of this route which rendered Turkish power supreme in western Arabia. On June 6, 1916, the Sherif Hussein threw off the suzerainty of the Turkish Sultan and assumed the title of King of the Hedjaz. "The Emirate of Nejd and Husa," in central Arabia, which has an estimated population of 400,000 has been absorbed by the Kingdom of the Hedjaz. See below, under *History*. Its capital is Rujadh (population 20,000). Other towns are Boreida (15,000) and Anciza (10,000). Hides, butter,

dates, textiles, and live stock were produced and exported to some extent. In 1914 the Emir Ibn Saud expelled the Turks from Hosa and pushed his dominions to the borders of the Persian Gulf. (2) *The Emirate of Jebel Shammari* in central Arabia north of Nejd. The estimated population is placed at 250,000. The capital is Hail. In 1920, the emirate was annexed by the Kingdom of Hedjaz. (3) *Asir*, a small area on the Red Sea coast, south of the Hedjaz, with an estimated population of 1,000,000, also has come under the control of Ibn Saud. (4) *The Imamate of Yemen*, at the southwestern extremity of the peninsula. Its estimated area is 75,000 square miles; estimated population, 2,000,000. The capital, Sanaa, had 25,000 inhabitants; the chief port, Hodeida on the Red Sea, 40,000. Mocha is another port. The leading economic resource is coffee, which is exported through Aden. On the east, the leading principalities are virtually British protectorates, for Great Britain supported the reigning houses and controlled their external policies. These principalities were: (5) *The Sultanate of Oman*, in southeastern Arabia, with a coast line of 1000 miles on the Oman and Persian gulfs. Its area is 82,000 square miles; population, 500,000. The largest cities are Muscat and Matrah, which together have 20,000 inhabitants. Dates are produced and exported, while the imports include rice, cotton goods, and coffee. All these enterprises are controlled by British Indians, and it is with India that intercourse is mainly carried on. The Sultan's independence was guaranteed by Great Britain and France, a step made necessary by the turbulence of the interior tribes which recognized the sovereignty of the local Ibadhi imamate rather than that of the sultanate. (6) *Trucial Oman*, on the eastern coast, made up of five sheikdoms. (7) *El Qatar*, a sheikdom on the peninsula of that name, from which the Turks were driven out in 1913 by the Emir of Nejd. (8) *Bahrein*, made up of a group of islands of which Bahrein Island is the chief. The ruling sheik is maintained by a British subsidy. (9) *The Sultanate of Koweit*, in the southeast on the Persian Gulf. It has an estimated population of 50,000. The town of Koweit is of considerable importance and most of its trade is carried on with India. In 1914 the Sultan renounced the sovereignty of Turkey and threw in his lot with the Allies. The present ruler is subsidized by the British government. The remaining political divisions are: (10) *The Protectorate of Aden* (see ADEN); (11) *The Kingdom of Transjordan* (see TRANSJORDANIA). Irak, Syria, and Palestine also are Arab lands, though situated north of the Arabian peninsula. Consult articles under those titles.

**Explorations.** The War greatly retarded the exploration and subsequent mapping of the country, so that it is doubtful whether much more was known of this land in 1929 than in 1914. While some new knowledge was acquired of the topography and social and economic life of Asir and Yemen, the only real advances were made in central Arabia and in the Hedjaz Kingdom. The outstanding achievement was the work of H. St. J. B. Philby, who, in 1917, on his way to the court of the powerful Emir of Nejd, penetrated into the heart of central Arabia and thus was the first European in 100 years to cross from sea to sea. His journey lay from Ojair on the Persian Gulf to Jedda on the Red Sea, by

way of Hofub, Riyadh, and Taif. In the following year, he journeyed into the southern provinces of Nejd, laying his course from Riyadh to Dam, the capital of the little-known Wadi Dawasir. As a result of these activities, cartographers were able to settle more accurately the locations of such places as Riyadh, Hair, Sulaiyil, and Dam. His discoveries of a large lake near Laila and of several reservoirs were of particular importance. Two other travelers achieved notable success. In 1914 Miss Gertrude M. L. Bell (1868-1926) and Capt. W. H. I. Shakespear each added 1500 miles of survey by their observations. The latter, in a three and one-half months' journey just before the outbreak of the War, crossed Arabia by a northern route, traversing 1200 of the total 1810 miles, through country hitherto unknown to Europeans. His line lay from Koweit, on the Persian Gulf, to Kuntilla, the first Egyptian outpost in Sinai. Shakespear was killed in January, 1915, in a clash between forces of Ibn Saud and Ibn Rashid. During war operations, British military and naval officers carried on extensive researches in the Hedjaz.

**Communications and Trade.** The only railway in Arabia is still the Hedjaz line, though the construction of two branch lines has been considered. The first is to run from Medina to Mecca (280 miles) and the second from Maan to Akaba on the Red Sea. Internal communications are carried on by means of the native caravan routes, the most important of which is the transpeninsular track from Zobeir to Jedda by way of Boreida and Mecca (913 miles). Economically, the activities of the Arabs are devoted largely to the satisfaction of their local needs. Cereals are cultivated, and camel, horse, and ass rearing is carried on to some extent. Articles of export include dates, hides, coffee, pearls, and the native butter; imports are made up of cotton goods and foodstuffs. On the western coast, the important ports of call are Aden, Hodeida, Jedda, Mocha, and Jeizan; on the eastern coast, Muscat, Manama, and Koweit. The only ports carrying on a considerable commerce with Europe and the East are Aden and Manama, which are the entrepôts for Arabia.

**History.** The story of Arabia, since 1914, may be divided into two phases: the first that of the ascendancy of the British in Arabian affairs, exerted largely through the control of the King of the Hedjaz; the second that of the passing of this influence with the growing suspicion of British purposes and the impressive rise to power of the Emir Ibn Saud, leader of the native Wahabi movement. Arabs had looked coolly on the Pan-Turanian movement before the War; what nativist sentiment there was was largely centred in the idea of an Arab empire free from Turkish control. At one pole was thus the ambition of the Ottoman Sultan to absorb Arabia completely; at the other stood the aspirations of the various local leaders to head a nationalistic movement. It was the ability on the part of the British to capitalize this discontent that saved Arabia from a holy war and freed British possessions in Arabia and East Africa, as well as India, from the threat of serious Ottoman attack. In Hussein, the Sherif of Mecca, the British found the key to the situation, for in 1915 they succeeded in making a treaty with him which guaranteed the establishment of an independent Arab state under the Sherifian family for the support of the war against the Turks. Thus buttressed



by British arms, Hussein, who up to 1913 had fought in the Turkish cause, threw off his allegiance to the Sultan and in June, 1916, declared his independence. In December, he assumed the title of King of the Hedjaz; in the next year, he was recognized by the Allies. The Anglo-French declaration of Nov. 8, 1918, renewed the promise of Arab independence; the Hedjaz was represented at the Peace Conference by Hussein's ambitious son, the Emir Feisal; and in 1920 the country gained admittance into the League of Nations. But after 1920, it was perceptible that neither was Hussein a dominating power in the Arab world nor was it at all likely that Hedjaz would ever grow to be a united Arab kingdom. In the first place, Pan-Arab ideals envisaged the incorporation of the Sudan, Syria, Palestine, and Mesopotamia with Arabia, an amalgamation which Great Britain and France were prepared actively to oppose. By the Sykes-Picot agreement of 1916 and the Balfour Declaration of November, 1917, the French and British had indicated their interest in Mesopotamia, Syria, and Palestine, which they took as mandates when the War was over, regardless of Pan-Arab protests. To some extent, however, the British government was willing to utilize Hussein's aspirations. Accordingly, two of Hussein's sons were given thrones. Emir Feisal was established in Iraq (see MESOPOTAMIA) and Emir Abdullah in Korak, or Transjordan (see TRANSJORDANIA). The British administration in India vigorously opposed the extension of Sherifian power because of the Moslem objection to seeing the Holy Places in the hands of an admittedly British-controlled kingdom. However, when in 1924 the Turkish Nationalists abandoned the caliphate (q.v.) Sherifianism was strengthened and King Hussein not only revived his political ambitions but aspired to the caliphate also.

But the Arabs of central Arabia looked askance at a dynasty which they believed was so obviously being used as a pawn by British imperialism, and increasingly pinned their hopes on Nejd as the nucleus of Arab nationalism and on Ibn Saud, its Emir, as their leader. In 1914 Ibn Saud allied himself with Great Britain and waged war against his neighbor to the north, Ibn Rashid, Emir of Jebel Shammur, who had espoused the cause of the Turks. By 1918 he was master of central Arabia and, in the years following the War, he consolidated his position. Hussein's pretensions to the caliphate he regarded with indifference, and when in 1924 Hussein, after a visit to Amman, his son's capital in Transjordan, began to style himself King of Arabia, Ibn Saud replied bluntly that he was not acceptable to central Arabia in such a rôle. Hussein's power rapidly declined. Although he was proclaimed caliph by Arabian Mohammedans on March 7, 1924, and also by a meeting of Arab dignitaries in Mecca late in the summer, his claim received only indifferent support outside of Arabia or was actually opposed. He signed a treaty of friendship with Soviet Russia, but refused to sign a proposed treaty with England because it sanctioned by inference the retention of British control over Palestine. When Ibn Saud attacked Hedjaz in September, 1924, after his forces had been repulsed by British arms in attacks on the British mandates, Transjordan and Irak, Hussein's appeal for help was denied by the British. On Oct. 4, 1924, Hussein was forced to abdicate in favor of

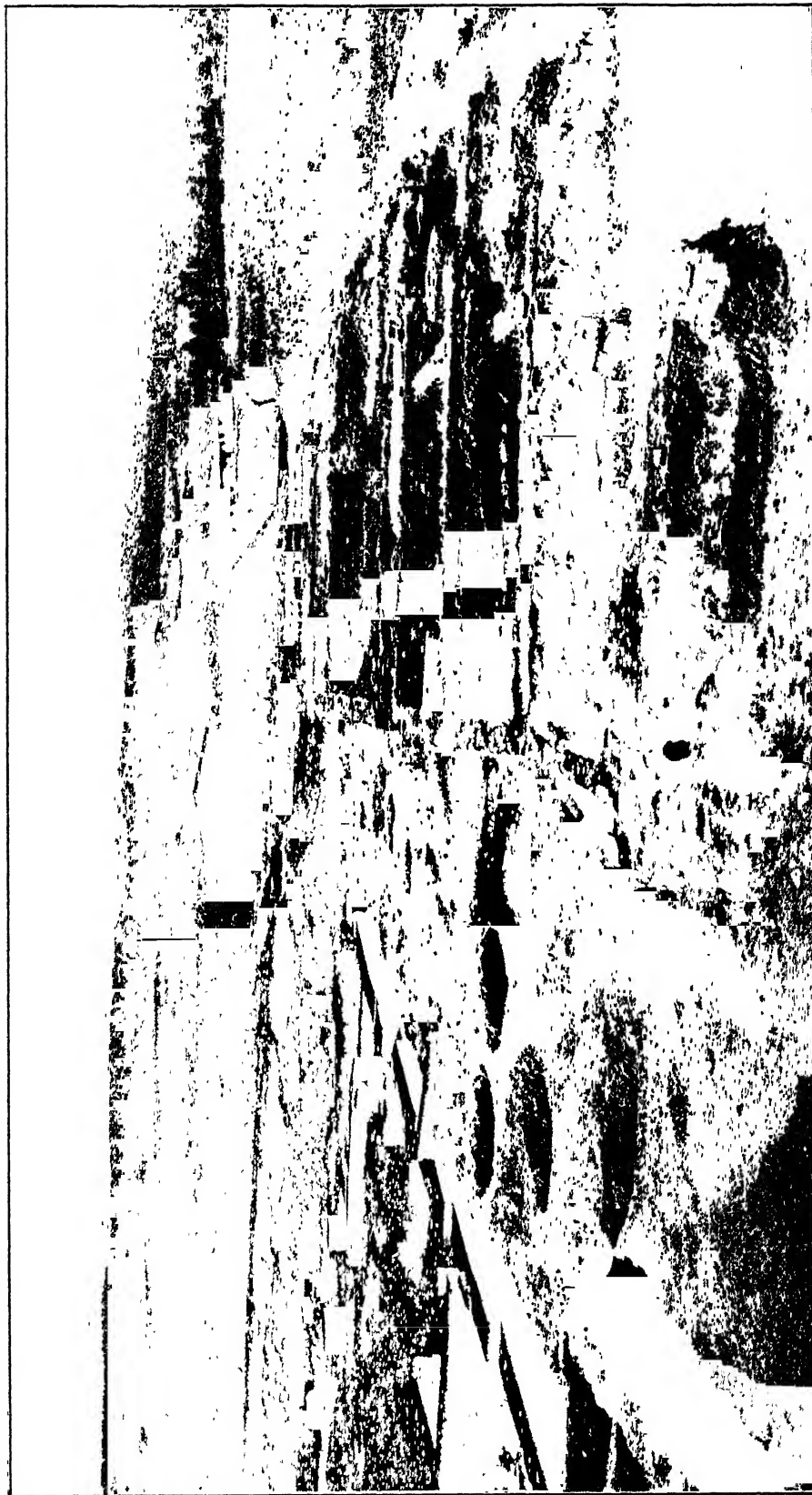
his son Ali, who at once evacuated Mecca. Ibn Saud's forces advanced on Mecca and captured it. Ali retreated to Jedda, the seaport, where he received some aid from his brothers and prepared for a siege. The Wahabi forces reached the city on Jan. 23, 1925, and remained encamped around it until June, when it was temporarily abandoned.

During nearly the whole of 1925, the situation was that of a stalemate between the opposing forces. The annual pilgrimage to Mecca was drastically curtailed by the state of war, pilgrims from India being landed only after the British had sent a warship to Rabegh. In August, Ibn Saud attacked the Holy City of Medina and the report spread that he had desecrated it with a bombardment which injured the tomb of Mohammed itself. He denied the charge, saying that he had no cannon, but it was later effective in weakening his prestige and affecting his claims to the caliphate. King Ali's resistance grew weaker and on December 20 he abdicated, leaving the whole Kingdom of Hedjaz to Ibn Saud. An agreement between Great Britain and Ibn Saud fixing the Transjordan-Nejd frontier was published December 23.

Ibn Saud proceeded to consolidate his position. On Jan. 11, 1926, he was proclaimed King of the Hedjaz at Mecca and was presently recognized as such and as Sultan of Nejd by the leading powers having interests in Arabia, except Italy and Egypt. He turned his attention at once to smoothing the path for the throngs of pilgrims coming annually to Mecca, providing for their comfort and reducing the costs of the pilgrimage. In order to advance these objects still further and to consider other Moslem problems, he called a Pan-Moslem Congress at Mecca. It met June 6 and was attended by Sunni Mohammedans from most of the Moslem world. In June and July, it discussed questions of hygiene and sanitation, hospital and medical services, transportation, etc., in connection with the annual pilgrimages, and considered a constitution for similar annual meetings in Mecca as well as for an executive committee consisting of representatives from various Moslem countries.

In August, King Ibn Saud promulgated a constitution for the Hedjaz which proclaimed the country a monarchy with capital at Mecca. While the King, in accordance with Moslem custom, was given absolute power, the constitution also provided for local and regional councils. Recognition of Ibn Saud's dominating position in Arabia prevented much further friction. In October, 1926, the Idrisi Emir of Asir, to the south of Hedjaz, placed himself under the protection of Ibn Saud on terms which made him partially a vassal, and later Ibn Saud extended his authority over a number of tribal chiefs. The agreement with the Emir of Asir almost brought armed conflict with the Imam of Yemen, who also had ambitions for the control of Asir, but British and Italian influence prevented hostilities.

On May 20, 1927, a treaty with Great Britain was signed at Jedda by which that country recognized the independence of Ibn Saud's government and various matters relating to the frontiers of his territory and of the British protectorates were arranged. King Ibn Saud also agreed to do what he could to suppress the slave trade. In November, 1927, a Wahabi raid led by Mazid Ibn Dawish into Irak was reported, with loss of life on both sides. The raid was said



*Courtesy of Professor David M. Robinson*

THE CIVIC CENTRE AT OLYNTHUS  
HOLES INDICATE GRANARIES FOR THE STORAGE OF GRAIN  
EXCAVATIONS MADE IN GREECE IN 1928 BY THE JOHNS HOPKINS UNIVERSITY

ARCHAEOLOGY



*Courtesy of The Metropolitan Museum of Art*

EXCAVATION AT THEBES, EGYPT

to be due to the establishment of a police post at Busiyah, 75 miles north of the frontier, against which Ibn Saud had protested. This and later raids caused much general uneasiness, with suggestions of possible war between the British and the Arab Kingdom. But the difficulties apparently arose from the restlessness of unruly tribes on the border and the good relations between the governments remained undisturbed. On Jan. 21, 1920, Wahabi raiders fired on a party of Americans between Basra and Koweit, killing an American missionary, the Rev. Henry Bilkerd. British airplanes bombed the raiding party, which, apparently, was made up of tribesmen hostile to Ibn Saud who wished to involve him in difficulties with foreign countries.

While Ibn Saud was extending his dominion over nearly all Arabia, the Imam Yahya of Yemen, spiritual head of the Zaidi sect, maintained his position of independence and attained a prestige second only to that of the conqueror of Hedjaz. During the war, he threw in his lot with the Turks and caused the British in the Aden protectorate much trouble. At the end of the war, Hodeida was occupied for a while by British troops. In 1921 the Idrisi captured that port and held it until 1925, when the Imam Yahya of Yemen drove them out. His relations with the British continued less than friendly after the war. In 1919 a British mission was captured and held for several months. His action in occupying a stretch of territory in the hinterland of the Aden protectorate was the source of friction with the British and, in order to come to terms, a British mission visited him at the close of 1925. It was unsuccessful, and a second mission in the following summer likewise failed, as the Imam refused to surrender the disputed land. Italy, however, signed a treaty with him (1926) in which that country recognized his independence and promised commercial and industrial aid. The next year, a mission from Yemen visited Italy and it was reported that it had arranged a secret treaty providing for Italian aid, through the furnishing of arms and otherwise, and still further strengthening the understanding between the two governments.

#### ARBITRATION, IN INDUSTRIAL DISPUTES. See LABOR ARBITRATION.

**ARBOS, ENRIQUE FERNANDEZ (1863- )**. A distinguished Spanish violinist and conductor (see VOL. I). During the season of 1903-4 he was concert master of the Boston Symphony Orchestra. Returning to Madrid, he settled there permanently as conductor of the Orquesta Sinfonica and professor of violin at the Ateneo. In 1928 he revisited the United States as guest-conductor of the New York Symphony Orchestra, and again the next year as guest-conductor of the Boston Symphony Orchestra.

**ARCHÆOLOGY.** Egypt perhaps less than any other country felt the impact of the World War, so that here there was a more consistent development of work than elsewhere. At Abydos in 1914, behind the West wall of Seti's temple was found what is probably the mystic tomb of Osiris. This is an underground structure, thirty feet below the level of the temple. It may be described as a rectangular hall about 60 x 100 feet with walls 20 feet thick. There are three aisles separated by huge monolith piers 8 and a half feet square and 15 feet in height, 5 on each side of the central aisle. These piers support an enormous architrave, 6 feet in height, which

in turn carries a ceiling of granite blocks 6 feet in thickness. In 1917 the expedition sent out by the University of Pennsylvania investigated at Gizeh the ancient necropolis near the pyramid of Cheops. It was found that the tombs belonged to princes and lesser officials. The burials took the form of shaft graves. From one tomb was recovered an inscription containing the cartouches of Cheops, Chephren, and Dedefra, which established the fact that these kings followed each other in the order given.

The most consistent work, at least in continuity of exploration, was that of the Metropolitan Museum of Art, of New York City, which from 1910 investigated its chosen site at Thebes. In 1918 it carried to completion the excavation of the palace city of Amenhotep III. On this site in 1922 was discovered one of the most important demotic papyri yet found. It throws light on the history of Egypt during the period 809-246 B.C. During his work at Illahun in 1920, in which he cleared the 12th dynasty pyramid and its surroundings, Petrie came most unexpectedly on a small undisturbed prehistoric cemetery which contained about one hundred burials. Practically every stage was represented from the open grave to the shaft tomb. In all, 30 different types were counted. One of the most interesting finds of the year 1920 was the discovery of the 11th dynasty tomb of Mehenkwetre. It lay to the south of Deir el-Bahari. In the monument was a small chamber which contained a complete set of funerary models of gardens with pools, fruit trees, covered walks, slaughter houses, carpenter shops, breweries, bakeries; in fact there was found the complete equipment of a princely house.

In 1921 the Egypt Exploration Fund resumed its work at Tel el-Amarna. This had been interrupted by the War. Had the town no other claim to distinction than its association with the name of Akhenaten it would still be interesting. But excavations showed that it presents a beautiful illustration of organized town-planning. One of the most interesting discoveries was that in some instances the streets reached a width of 180 feet. The digging afforded much information as to the character of the private houses of the Egyptians. Of course, in this case the houses were for the use of workmen, and, doubtless for economy, they were arranged according to one plan; yet it may be assumed from that very fact that the plan was usual. It showed in the centre of the house a square living room with its clerestory. In this room was a large clay brazier for heating and an ablution slab for the ceremonial washing of hands and feet. The work of the succeeding year, 1922, was concentrated on the workmen's village, the main city, the river temple, and the precinct of the south pool. From this campaign was derived an excellent idea of a princely villa. About the time of this discovery, Petrie was doing interesting work a mile or so distant from the Royal Tombs at Abydos. Here it was found that each king had laid out a great square of graves about 240 x 400 feet. In this area were discovered some 500 graves in which was evidence of the practice of human sacrifice. Apparently, at the death of a potentate, court officials were buried alive with their master. One might imagine that such a custom must have had a depressing effect on the desire to hold office. The dates of the interments are ranged from the 3d to the 5th dynasty, that is to

say, 5437-5363 B.C. Among the objects found was an ivory comb of King Zet. Many bone arrow heads and neatly trimmed flints were recovered.

The most spectacular discovery since Theodore N. Davis's finding of the tomb of Youa and Touya was the opening of the rockcut tomb of Tutankhamen (q.v.) by Lord Carnarvon and Howard Carter in the Valley of the Tombs of Kings at Luxor in 1922. Here below the tomb of Rameses VI was uncovered the opening of the tomb of this king. A flight of stairs led down to two rock-hewn chambers which were literally crammed with golden treasure. The intrinsic value of the find, estimated at \$40,000,000, is astounding enough in itself. The tomb was a revelation of the luxurious life of an Egyptian king in the second millennium B.C. (c. 1350). Owing to differences between the Egyptian government and Mr. Carter, who carried on the work after the sudden death of Lord Carnarvon, the exploration of the tomb was interrupted, but work was resumed in 1923. Every year since then has witnessed new finds of great importance. During the winter of 1927-28, the fourth and last chamber was opened.

As far back as 1911, the Archaeological Survey of Nubia showed a certain correlation of the culture of this land with that of early Egypt. So far as can be made out, the indigenous population of the Nile Valley was closely related to this Nubian stock. In the course of time, this primitive civilization was overrun by the invasion of a race which seems to have come in from Asia and to have begun this dynastic history of Egypt. As if in retribution, this Nubian stock appears to have returned, at a much later date, to its ancient dominion of the Nile Valley. This is borne out by the results of the expedition sent to Nubia in 1921 by Harvard University and the Boston Museum of Fine Arts. At Napata, the explorers examined royal cemeteries and at Nuri a group of pyramids belonging to kings and queens who lived in the years 860-250 B.C. Not the least interesting event was the uncovering of the burial chamber of Tihaga, who is mentioned in Isaiah. From the data collected by the expedition, it is fairly well established that this Ethiopian people, of Libyan origin, entered the land about 900 B.C. and eventually became the conquerors of Egypt.

Asia Minor, because of the operations of the War, was a less profitable archaeological field than Egypt. The Mesopotamian Valley became a seat of war and the great excavations inaugurated by the Germans at Babylon in the last years of the nineteenth century by Koldewey came to a close with the opening of hostilities. The resumption of archaeological work throughout this territory was tardy. In a measure, the delay was occasioned by the manifest hostility of the Turks toward Western people. In 1920 the British Museum resumed its work at Carchemish, which had been interrupted in 1914. The efforts of the excavators were concentrated upon the site of the double ring of the city walls. On the land side, all the gates, the fortifications of the acropolis, and the great river wall were cleared out. On this site of Carchemish were discovered a number of Hittite tombs and certain other archaeological material belonging to this race. All evidence illuminating this mysterious people is welcome, but in spite of attempts to show an Indo-European source for the race, re-

sults at the end of this period had not been conclusive. One particular bit of evidence for the story of prehistoric Greece at least is the discovery of an inscription which records a treaty between a certain Hittite King and Atreus of Mycenae. Not only is this document important for establishing contact between the Greek mainland and the coast of Asia Minor, but also it strengthens the value of Homer as a historical document. Work at Nippur produced new tablets narrating the stories of the creation and the deluge. With amazing rapidity, the early history of Mesopotamia is being revealed by finds at Kish and Ur. In the latter place, among the most remarkable finds were those of the year 1928 which brought to light the grave of the King and his Queen Shih-ad. The amount of gold treasure found in this latter's tomb speaks vividly of the luxury in Ur in the fourth millennium B.C. Moving westward into Palestine, the diggings of the English at Bethshehem threw some light on the origin of the Philistines, who appear to have been a people penetrating from the Mediterranean area.

The establishment of the American School at Jerusalem has produced results which help to clear up the early history of this part of Palestine. Much of this work has centred in Jerusalem itself.

Greece was the scene of renewed archaeological activity at the close of the War, as well as the islands of the Aegean, and the eastern shores of the Mediterranean. In 1922 the American School of Classical Studies, in association with the Fogg Art Museum of Harvard University, began explorations at Rhodes. At Colophon, the French had been engaged in excavating. At the latter place evidences of geometric culture, probably of the sixth century, were discovered, and at one place a Mycenaean beehive tomb was found, which shows that about 1000 B.C. the culture of Ionia was about the same as that of the Aegean and the Greek mainland. As in Egypt, considerable of the archaeological work in Greece was connected with the problem of the prehistory of the country. For a long time it had been the concern of scholars to discover the source from which came the pre-Mycenaean stock. As early as 1912, Wace and Thompson worked in Thessaly and were able to establish that, at least in that part of Greece, the inhabitants had penetrated into the peninsula from the North. In this early period, contact with the southern Mycenaean culture of the Mediterranean was not established until well on toward the close of the Bronze Age. This pre-Mycenaean civilization was latterly given the somewhat vague name of Helladic. That the people represented by this culture penetrated gradually southward until they overran Greece is proved by Blegen's discoveries at Korakou, not far from Corinth. From the evidence already accumulated it would appear that this Helladic culture represented what might be called the original civilization of the Greek mainland and that its creators continued in control of the country until, fairly early in the second millennium before our era, the race represented so well in the remains in Crete and later at Tiryns and Mycenae invaded from the Mediterranean, and conquering the native stock, made themselves overlords and gave us what we call Mycenaean culture. The use of the term Helladic indicates an effort to discover a name which will describe more accurately than Mycenaean or Minoan that culture which in



ARCHÆOLOGY



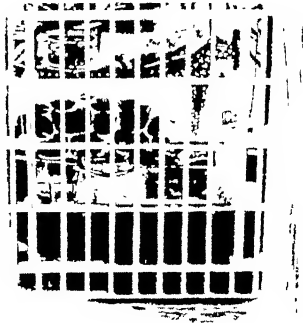
*By courtesy of Mr. Howard Carter*

**THE ROYAL CEMETERY IN THE VALLEY OF THE TOMBS OF THE KINGS AT  
LUXOR**

**Showing the Tomb of Tutankhamen below that of Rameses VI**



## ARCHÆOLOGY



*By courtesy of Mr. Howard Carter*

### THE TOMB OF TUTANKHAMEN

1. Interior of the Antechamber of the Tomb of Tutankhamen
2. The Antechamber as seen from the Passage through the Steel Grille installed for protection

the days of the florescence of Mycenæ, to use the words of one of its inventors, Dr. Blegen, extended "from Thessaly to southern Laconia and from Thoricus to Pylos." The name, as can be seen, is intended more closely to fit the breadth of culture which obtained in early Greece than any local or dynastic name could. This culture, or rather the period covered by this name, follows upon the Neolithic Age in Greece. It is synonymous with the Age of Bronze. Its dates are about 2500 B.C. to 1200 B.C. Since it is a period in which dates are all too vague, it has been found convenient to divide it, as in Crete, into three divisions, known respectively as Early Helladic (2500-2000), Middle Helladic (2000-1600), and Late Helladic (1600-1150?). Late Helladic is meant to be synonymous with Mycenaean. This was the time when the power of Minoan Crete had extended northward and overcome the indigenous culture which, developing on the mainland, had stemmed from the North before the coming of the Aegean folk.

Wace, who had previously worked in Thessaly, showed by work at Mycenæ that this place was already inhabited at the close of the Neolithic Age and became a flourishing city about 2000-1500 B.C. He discovered that the famous circle of graves within the Lion Gate belonged to this time. His examination of the palace made it clear that the structure was much more elaborate than had previously been believed. It appeared that, after Cnossus fell, the city was fortified by a wall which was also carried around the famous circle of graves. At that time, the ground was leveled, the circle of slabs erected, and new gravestones put in place to mark the site of the original burials. These tombs belong to an earlier dynasty than that represented by the beehive tombs. To return to the palace, Wace found that the structure, which dates 1400-1100 B.C., is of the megaron type. Under it were traces of first or second Late Helladic culture (1600-1400). To this latter time belong the circle of graves which continued in use until 1400 B.C. Under the present palace remains were those of an earlier palace dating about 2200-1800 B.C. This structure, older than the palace at Tiryns, was later replaced by one belonging to the first Late Helladic period, and that in turn by one much larger. This one recalls the building at Cnossus and helps to show the relationship of this culture with that of Crete. The accumulated evidence makes it clear that the earliest settlement on the site goes back to the beginnings of the Bronze Age. The place became important in the period reaching from 1800 to 1600 B.C. By the year 1300, Mycenæ had become the chief city of that part of Greece and so continued until the coming of the Dorians.

The most recent contribution of importance is the excavation of the site of Olynthus by Dr. Robinson of Johns Hopkins University. Much light has been thrown on Greek history of the fifth and fourth centuries B.C.

At Carthage, notable work was done by the French, who excavated two Punic temples and a Punic acropolis dating about 700 B.C. Near the Punic parts of the city was discovered the temple of Tanit in the midst of a field which was practically covered with votive inscriptions set up in her honor and to Baal Ammon. Under these inscriptions was uncovered a bed of urns containing the bones of birds and sheep as well as those of a few children. In the

deepest stratum, third from the top, many jars were found containing the bones of children whose ages ranged from four months to twelve years, grim evidence of the human sacrifice practiced in the name of the goddess Tanit. The date of these remains is about 800 B.C. So far as can be made out, Carthage was a flourishing Egyptian colony at the time Dido was supposed to be building it. Egypt had established a settlement there some 500 years before the coming of the Phœnicians.

One notable discovery was made in 1921, when an important hypogeum was located outside Porto Maggiore. The building dates from the end of the second or early in the third century of the Christian era. In the upper part is a sepulchral chamber down to which leads a staircase that ends on a landing just outside the room. The main chamber is 15 x 17 feet and has a vaulted roof with an opening for light in the middle. Besides the two main rooms, there are several galleries. After the close of the War, excavations were pushed at Ostia and Pompeii. In addition to this, many smaller, unimportant places had been more or less spasmodically dug. Possibly the most interesting work was in connection with the excavations at Pompeii, where not only much interesting material was actually recovered but much that would otherwise have been lost was saved by the skillful use of plaster poured into the natural molds made by the volcanic deposit on the various objects covered by it. In this way, it was possible to restore the appearance of such things as house doors, even to the bronze hinges, the nails, and the very grain of the wood. The same care was displayed in the reconstruction of houses, with the result that in several places it was possible to reconstruct the overhanging balconies and the window frames of the fronts of houses in such a way that much of the original appearance of the street was obtained. At Syracuse, excavations were conducted on the site of the temple of Athene. Under the foundations of the building, the Italians discovered traces of pre-Hellenic settlement. These remains were succeeded by early colonial Greek remains.

Of late, Italy has come back with enormous enthusiasm to archaeological work. The most impressive undertaking is the clearing of the site of Herculaneum, which because of the great depth of deposit, is most arduous. The draining of Lake Nemi undertaken to recover the pleasure ships sunk there is another engineering feat to the credit of the Italians. In Spain, France, England, and Germany, discoveries of minor importance have been made from time to time, usually unpremeditatedly. See ETHNOLOGY.

**ARCHER, GLEASON LEONARD** (1880- ). An American lawyer, educator, and author, born at Great Pond, Me., and educated at Boston University and the university law department (LL.B., 1906). He was admitted to the Massachusetts bar in 1906; in the same year, he founded the Suffolk Law School and became dean and treasurer. He was appointed chief arbitrator by the State of Massachusetts in the Springfield street railway dispute of 1914. In 1926 Atlanta Law School, Atlanta, Ga., conferred an honorary LL.D. upon him. He is author of *Law Office and Court Procedure* (1910), *Ethical Obligations of the Lawyer* (1910), *Law of Contracts* (1911), *Law of Agency* (1915), *Law of Torts* (1916), *Equity and Trusts* (1918), *Law of Evidence* (1919), *Introduction to the Study*

of Law (1919); *Building a School* (1919); *The Law of Real Property* (1923); *Criminal Law* (1923); *Wills and Probate* (1925) and *The Impossible Task* (1926).

**ARCHER, WILLIAM** (1856-1924). An English dramatic critic (see Vol. II). Shortly before his death, Mr. Archer ventured into play writing. *War is War* appeared in 1919, *The Green Goddess* in 1921, and *The Old Drama and the New* in 1923. His plays are considered relatively of much less importance than his critical work.

**ARCHIBALD, RAYMOND CLARE** (1875- ). An American professor of mathematics and author, born in Colchester County, N. S., and educated at the University of Mount Allison, N. B., Harvard University, the University of Berlin, the University of Strassburg, the Sorbonne, and the University of Rome. He began his career in Canada as professor of mathematics at Mount Allison Ladies' College and Acadia University, and in 1908 was called to Brown University, Providence, R. I. He was promoted to professor in 1923. He was elected member of the Council of the American Mathematical Society in 1918, and librarian in 1921. In 1922 Professor Archibald became president and in 1923 trustee of the Mathematical Association of America. In 1922 the University of Padua conferred on him the honorary title of doctor. Besides contributing extensively to mathematical journals and reviews in Europe and America, he is author of *The Cardioid and Some of Its Related Curves* (1900); *A Bibliography of the Life and Works of Simon Newcomb* (1905 and 1924); *Carlyle's First Love, Margaret Gordon, Lady Bannerman* (1910); *Mathematical Instruction in France* (1910); *Euclid's Book on Divisions of Figures with a Restoration* (1916); *The Training of Teachers of Mathematics for the Secondary Schools of the Countries Represented in the International Commission on the Teaching of Mathematics* (1918); *Benjamin Peirce, 1809-1880* (1925); and *Bibliography of Egyptian Mathematics* (1927). He was editor of the *Bulletin of the American Mathematical Society*, 1914-20, and of the *American Mathematical Monthly*, 1917-18, and editor-in-chief of the latter, 1919-21. He became associate editor of *Revue Semestrielle des Publications Mathématiques* in 1921, and of *Isis* in 1924.

**ARCHIPENKO, ALEKSANDR PORFIRIEVICH** (1887- ). A Russian sculptor, esteemed the foremost of radical modernists. He was born at Kiev, studied two years at the Moscow Art School, and went to Paris at 20. He was influenced by the Byzantine art of his native land, the monumental sculpture of Egypt and archaic Greece, the Gothic, which he studied in the Louvre, and Central American carvings. Rejecting Cubism, he aimed to achieve pure, abstract sculpture independent of natural form. His figures were slender and rhythmic, the heads unfinished and small. One of his innovations was to hollow out the parts of the figure he wished to emphasize, which the imagination of the spectator was expected to fill; another was "sculpto-paintings" in which wood, metals, and papier-mâché were combined in decorative panels. His school at Paris was dispersed by the World War during which he worked at Nice. In 1921 he removed to Berlin, where he established an important school, and in 1924 to the United States. He is represented in many Continental museums, including Berlin, Vienna, Frankfurt, and Rotter-

dam, Nisaka in Japan, and the Société Anonyme in New York. Consult his biography by Hans Hildebrandt (Berlin, 1923).

**ARCHITECTS, THE AMERICAN INSTITUTE OF.** The national organization of the American architectural profession. Delegates from the chapters (which numbered 58 in 1928) assembled in annual convention constitute the highest authority in the organization and elect the officers and directors and determine all policies of the Institute in professional matters. The Institute was founded to organize and unite in fellowship the architects of the United States, to promote the æsthetic, scientific, and practical efficiency of the profession, and to spread an understanding of art and service among the people. Its activities include efforts to improve and extend architectural education in universities and in the lower schools; it sponsors and works for proper laws for the registration of architects in various states; and maintains a public information service to give the prospective builder the financial as well as the æsthetic service of the architect. The sixty-first annual convention was held in 1928, at which time the Board of Directors reported that Maurice Chauchon, of Paris, was in the United States to study, as the second appointee of the association under the conditions of the French Traveling Fellowship, made possible through the gift of Julian Clarence Levi, of New York.

The Institute, under the direction of its Committee on the Plan of Washington and Environs, continued its campaign of urging upon Congress the desirability of effecting certain improvements to insure the future greatness of the national capital; the Committee on Education sponsored art courses given under a grant of the Carnegie Corporation, by which the Institute received \$10,000, making it possible for the committee in 1928 to invite 20 colleges to send their best art teachers to take an intensive course in the fine arts at the Fogg Museum at Harvard University. These instructors, in turn, were to reproduce such instruction for their students during the following year, in an effort to educate the public to a more intelligent interest in, and knowledge and appreciation of, architecture and the other fine arts. An annual feature of the national convention, in addition to the reports of the various committees, was the numerous lectures and addresses on architecture and related subjects. An important phase of the Institute's work was the attention it gave to the development of a plan to bring about working collaboration between the architect, the landscape architect, the painter, the sculptor, and the craftsman.

By 1928, more than 3000 of the 10,000 practicing architects in the United States were members of the Institute; the initiation fee was raised from \$20 to \$25 in 1927, which was in addition to the yearly membership fee of \$25. In 1928 the endowment fund of the Institute amounted to approximately \$75,000, the income from which was devoted to the maintenance of The Octagon House in Washington; the property and funds totaled \$338,625.87, of which \$46,176.16 belonged to the Waid Education Fund, the income being used to defray expenses of lecturers sent out to various States and to preparatory schools. The headquarters of the Institute are at The Octagon, Washington, D.C. Next to Mount Vernon and Monticello, The Octagon is probably the finest of the old colonial homes near Washington having historical significance.

It was designed by William Thornton, an eminent architect, and built in 1798 for Colonel William Tayloe; after the burning of the White House in 1814, it was occupied by President Madison and his wife, Dolly Madison, during 1814 and 1815, while the White House was being restored. The Treaty of Ghent which concluded the War of 1812 was ratified by President Madison in the Round Room of The Octagon on Feb. 17, 1815.

**ARCHITECTURE.** All over the world, the last few years have witnessed vital and deep-seated changes in architectural thinking and criticism. They have been years, if not definitely of progress, at least of a movement toward novelty whose speed, in comparison with style changes of the past, is amazing. In nearly all the European countries, the most important architectural buildings since the World War have been built in some sort of what is loosely called "modernistic" style; that is, a style which as far as possible disregards past traditions and attempts to create in accordance with the mechanical nature of modern materials and the technical and commercial basis of modern life. Up to about 1924, this movement had but little effect in America; but since the Exposition des Arts Décoratifs in Paris in 1925, there has occurred in the United States, also, a surprising swing to the left. At first, this movement was literary and commercial; it was boomed in books and by certain large shops out to develop a new market. Yet it caught the popular fancy. "Modernistic" interiors filled the decorating columns of Sunday supplements. "Modernistic" stage sets decorated the most expensive reviews at the theatres; modernism grew fashionable.

The effects of this were felt immediately throughout the architectural world, and even the usually conservative architectural press first grew tolerant and then in large part wildly, and rather non-critically, enthusiastic. Moreover, this movement came just at a time when the public was becoming more and more architecturally conscious and being fed with an unprecedented number of popular books on architecture. Edwin Avery Park's *New Backgrounds for a New Age* and the American publication of Le Corbusier's *Towards a New Architecture* are typical. Both of these works are obsessed with the idea of machinery and its effect upon modern life; both express the feeling that the great styles of the past have grown up in accordance with their own times and that twentieth-century inspiration from past styles is fundamentally illogical. Both are passionately sincere and underlying the æsthetics of both is the same rather bleak conception of beauty as the inevitable quality of something that works, expresses its working, and is easily and cheaply made, and is efficient.

In all the countries of Europe and America, commercial pressure and this basic æsthetic premise have mingled to produce three different types of radical designers. The first are the pure logicians, who attempt to design a building as they would solve a mathematical theorem; they produce the architecture of science. Such are A. and G. Perret in Paris, with their stark, concrete churches, e.g., Notre Dame, at Raincy, 1924; and in Germany, Walter Gropius, whose Bauhaus, at Dessau, 1926, is perhaps the most unmitigatedly mechanical of all modern buildings. The second type consists of the pure revolutionists, who are against the past because it is the past and demand a style that is, above all

else, new. It is this class of designers who first produced the *art nouveau* in France in the nineties. Its most characteristic modern exponents are to be found in America in some of the followers of Louis Sullivan. In France, this movement has produced some of its most attractive work through the medium of such brilliant craftsmen as Brandt, in iron, and Ruhlman, in furniture. The third group consists of those who are "modernist" to be fashionable; this class embraces that myriad legion of inadequate and worse craftsmen and artists who are born to follow and not to lead.

In addition, there are, of course, the really creative designers who transcend all these classes and absorb and transmute into a new synthesis not only the science and the novelty but also all the tradition which is still alive. It is to such as these that we must look for the creation of great architecture.

The chief characteristics of modern architecture so created today may be summarized as follows:

First, structural honesty. This implies a soundness of conception in the building as a whole, so that supporting members shall seem to support, etc.

Second, regard for material. This means not only that materials shall be used in a manner conformable to their qualities but also an eager quest for the most perfect material for each use and a continual effort to get out of new materials, frequently mechanically manufactured, the greatest possible decorative effect. The use of brickwork in much of the recent radical building in Holland and Germany is characteristic.

Third, independence. This quality means that the designer of a building should approach every problem in it unprejudiced by stylistic bias. It has led, among other things, to the development of vertical lines and the omission of cornices in American high buildings and, in Germany, to the nervous balancing of vertical lines and horizontal bands so characteristic of the work of Eric Mendelsohn.

Fourth, novelty in decorative detail. It is in this matter that there is the greatest divergence of opinion. Naturalistic ornament is common, especially in America, as in the arcade of the New York Telephone Building, 1926, by McKim, Voorhees & Gmelin, now Voorhees, Gmelin & Walker, or the bronze frieze of the Chanin Building, New York, by Sloan & Robertson, 1929.

There are other architects who believe that the only fit ornament for a mechanistic era is geometric. Chief among these are Buchman & Kahn, whose Number Two, Park Avenue, New York, 1927, is typical. There are others, still, who have devised a new category of forms, based largely upon Egyptian, Assyrian, and archaic Greek precedent, freely combined and readapted, or on stylized simplification of classic details. This, originally a peculiarly French idea, well illustrated in the iron work of Ferro-Brandt, in America has produced many of its most gracious manifestations, as in certain of the banks of Denison & Hiron.

**United States.** In the United States, it is natural that commercial buildings furnish the greatest number of examples of radical design, for they present the most modern type of problem. The extent to which this radicalism reigns can best be judged by the enormous growth of new loft buildings west of Fifth Avenue in New

York, between 34th and 59th streets. Here, almost without exception, every new building attempts novelty in design, largely following the example of the geometric modernism of Buchman & Kahn. Strictly commercial, the stepped masses of these buildings, occupying the limits of space allowed by the zoning law, produce an effect of stark power; the ornament that decorates them, though almost always radical in type, is unimportant. The best of these modern loft and office buildings is Number Two Park Avenue, by Buchman & Kahn, 1927, particularly noteworthy on account of the daring use of color—reds and blues—at its top, and the vivid richness of its lobby, in which ornament, basically geometric, though with occasional Assyrian and Egyptian touches, is used with the greatest imagination.

Office buildings pure and simple, generally of the skyscraper type, have felt the impact of commercial modernism somewhat less. Thus, the Tribune Building in Chicago, by Howells & Hood, 1925, though typically modern in its general towered effect, has all of its detail in a flamboyant late Gothic style, and even the American Radiator Building, by Raymond Hood, 1924, though entirely novel in silhouette, in its use of black brick, and in the balance of color and gilt, nevertheless bases all of its decorative detail on the same type of late Gothic.

The best of the modern office buildings accept the problem with a deeper logic by applying to the ornament the same novelty that governs the general design. The New York Telephone Building is typical of this synthesis. The lobby is particularly interesting because it shows a richness and warmth more associated with Renaissance styles than with so-called modernism; it uses bronze, marbles, modeled plaster, and a richly painted ceiling in ways convincing and imaginative. Yet despite the novelty of all its detail, its very warmth and richness are things which some doctrinaire modernists deplore.

The Fisher Building, in Detroit, by Albert Kahn, 1928, is another beautiful example of a modern problem, treated frankly, richly, and with a distinct sense of monumentality. Its piled up masses, broken into long, vertical bands of light and shade, have power and beauty, quite unconnected with their style. Somewhat similarly free, though treated in a different manner, is the American Insurance Union Citadel, at Columbus, Ohio, by C. Howard Crane, and Kiehler & Dore, Associated, 1927, noteworthy on account of its slim grace and rather strange, domical top.

Quite different, and expressive of the neo-classic type of decorative detail, is the Fidelity Mutual Life Insurance building, at Philadelphia, by Zantzinger, Borie & Medary, with sculpture by Lee Lawrie, 1927. This is a long, comparatively low building, whose parts have been reduced to such simplicity that real monumentality results, and the sculpture is fresh, architectural, and dignified. Particularly interesting is the balance of stone pier and cast metal window spandrels. Again, however imaginative and novel in conception and detail, it is a building which no thoroughgoing doctrinaire modernist would admire, as its use of stone and occasional arched forms would be considered contrary to the essence of steel structure. It is all a question of where the line is to be drawn and whether imaginative creation of architectural forms is to

be limited by mathematical theories strangely similar to the ethical theorizing of Ruskin, eighty years ago.

The Massachusetts Mutual Life Insurance Building, at Springfield, Mass., by Kirkham & Parlett, 1927, and the Kansas City Life Insurance Building, Kansas City, by Wight & Wight, 1925, both are spreading, low buildings in which no trace of modernism has entered; the first is modified colonial, the other is pure Greek revival. Other important office buildings, worthy of note, are the Southwestern Bell Telephone Company's building, St. Louis, by Mauran, Russell & Crowell, 1924; the addition to R. H. Macy & Co., New York, by Robert D. Kohn, 1924; and the exquisitely simple and refined Alabama Light and Power Company's building, Birmingham, by Warren, Knight & Davis, 1927—all in various types of freely novel detail. The last is unusually significant in the manner in which it is handled; its straightforward simplicity of line and mass is so quiet and unassuming that there is no unpleasant obtrusion of structural necessities, no effort to be theoretical. It is thus another example of those buildings which, although true to structure and true to their time, nevertheless do not force their date upon one. They are bigger than any one passing fashion.

There is no such pressure toward novelty in monumental and public buildings, for in them there is no such definite change in materials and requirements. Thus, there seems little that is inconsistent in such a building as the Detroit Museum of Fine Arts, by Paul Cret and Zantzinger, Borie & Medary, Associated, 1927, with its quiet and restrained classic beauty, and the Pasadena Public Library, by Myron Hunt and H. C. Chambers, 1927, with its refined, early baroque playfulness. The Municipal Auditorium of San Antonio, Texas, by Ayres, Ayres, Willis & Jackson, 1928, carries its Spanish Renaissance dress becomingly. In the Los Angeles City Hall, by Austin, Parkinson & Martin, 1928, just as the problem was a new one, due to the necessity of many floors of offices, so the solution was more fresh, and the detail, though basically classic, with occasional Romanesque and Byzantine touches, more novel and less academic. The continuing work on the Nebraska State Capitol at Lincoln, originally designed by the late Bertram Grosvenor Goodhue, and carried on by Mayers, Brust & Phillip, the Goodhue Associates, preserves vigor, novelty, daring freshness, and yet basic classicism. With unusual foresight, the authorities in charge have carried on the undertaking slowly and refused to yield to pressure to have the building completed more rapidly and more cheaply. As a result, there is year by year growing, in Lincoln, the most significant public building built during the last few years in America. The decorative floors and ceilings, largely the work of Hildreth Meière, are beautiful, integral parts of the whole scheme. Distinguished by a similar directness, although less simply powerful in conception, is the Los Angeles Public Library, also designed by the late B. G. Goodhue, 1925, whose chief characteristic is the brilliant manner in which, throughout the interior, the structural elements are allowed, themselves, to form the essence of the decorative scheme.

The style variation in commemorative monuments has been tremendous. Thus, the Kansas City War Memorial, 1926, and the New Britain,

Conn., War Memorial, 1928, both by H. Van Buren Magonigle, are handled with detail that is fresh and unconventional. In both, the main feature is a shaft and the main aim to produce simply an impression of rather restrained emotionalism. In the Nashville, Tenn., War Memorial, by Edward Dougherty and McKim, Mead & White, Associated, 1927, and the Harding Memorial at Marion, Ohio, by Henry Hornbostel and Eric Fisher Wood, 1928, the style is academic, in both cases Greek Doric, and the effect more cold. The smaller memorials, of which the Virginia War Memorial at Richmond, by Paul Cret and Marcellus E. Wright, 1925, is typical, run the whole gamut between.

Educational work continues, in the main, conventional. Thus, the Lawyer's Club at the University of Michigan, by York & Sawyer, 1924, is in the popular collegiate Gothic; the Harvard Graduate School of Business Administration, by McKim, Mead & White, 1927, is a scholarly, colonial group, with rather more than the usual imagination and charm in its composition; and much new work at the University of Illinois, by James M. White and Charles A. Platt, is Georgian in inspiration.

The great number of schools that have been built all over the United States are, unfortunately, rarely distinguished. More and more, the necessity for great size, low cost, and enormous window areas has tended to develop a school of almost factory type, particularly common in the Middle West. That this development is not necessary is evidenced by many noteworthy exceptions, such as several public schools in Yonkers, N. Y., by Howard Chamberlain, treated in a modified colonial; the one-storied schools of California, by Alison & Alison and others; and the parochial school of Sts. Simon and Jude in Brooklyn, by McGill & Hamlin, in an unconventional style of Romanesque derivation.

The most remarkable of recent school groups is the Cranbrook School, Cranbrook, Mich., by Eliel Saarinen, 1928. In this work the restraint and imagination of its designer—famous for his railway station in Helsingfors, Finland, as well as for his daring second prize design in the *Chicago Tribune* competition in 1924—is beautifully expressed. At first glance, simple, straightforward, and unassuming, these buildings reveal themselves, on closer scrutiny, to be full of the most subtle handling of materials and touches of ornament, fresh and imaginative.

A remarkable group whose purpose is at least partially educational is the Columbia-Presbyterian Medical Center, in New York, by James Gambrel Rogers, 1928. Here, the most efficient relationship of parts has been allowed to dictate the plan and the necessity for great height, because of limited area, has forced this complex plan into tall, deeply shadowed masses of great power. Its beauty is thus the product of inherent conditions. The whole group, because of its basic acceptance of the conditions of modern life, and its careful arrangement of all of those facilities which modern science has produced, is destined to wield a large influence in the future.

The largest ecclesiastical undertaking of the past few years has been the work on the Cathedral of St. John the Divine in New York, by R. A. Cram. This includes almost the entire nave, the beginning of the west front, the foundations of the north transept, and the completion of the baptistry. It is too early to judge the final appearance of the nave, but the baptistry, full of

strong Spanish influence, has a great sense of richness and beauty in its interlaced vaulting ribs and the great polychromed shields around the walls. Another important work of R. A. Cram is the Princeton Chapel, 1928. In this, as in the Cathedral, the inspiration is that of mediæval Gothic. It is all scholarly work, at times beautiful in proportion and detail, at times strangely cold and bookish.

Quite different in character are various attempts that have been made in the use of reinforced concrete in church design. The most ornate and ambitious of these is the National Shrine of the Sacred Heart in Washington, by Murphy & Olmstead, 1926. In this, not only are the main structural elements of concrete, but also all the Byzantine ornament, in which there is a rich and original use of color, produced by ingredients incorporated into the material itself. Much simpler is the impressive Cathedral of St. John, in Los Angeles, by Pierpont & Walter S. Davis, 1926. In this, the form marks give texture to the simple walls, and the ornament is carefully concentrated. The effect is impressive out of all proportion to the size and expenditure. Its simplicity forms a direct contrast to the complex Gothic of the Riverside Church, New York, by Henry C. Pelton and Allen & Collens, Associated. The enormous complexity and strange shapes of the steel work of this building, necessary to carry the Gothic forms adopted, are almost a perfect *reductio ad absurdum* of the attempt to combine twentieth century structural systems with thirteenth century architectural detail. It is probably some factor of this kind which makes so many of the small churches more effective than the large and monumental types, for in these smaller buildings, there is no such temptation to falsify, and the stringent need for economy that is so frequently present, thus itself becomes a benefit.

In housing, both in the city and in the country, style changes are much less evident than in the larger buildings. Here and there, the most radical design may appear, as, for instance in an apartment house in Los Angeles, by R. J. Neutra, 1928, which is frankly inspired by the ultra-radical work of Eric Mendelsohn in Germany, and in the quieter Peacock Apartments in Kansas City, by Borstrom & Brots, or the interesting apartment hotel in Sixty-third Street, New York, by Henry Churchill and Herbert Lippmann. These are, however, exceptions; elsewhere, conventionality reigns; the typical city apartment house has become a huge, rectangular box with many windows and a rich doorway—a type almost standardized, with details of all sorts and occasionally possessing the beauty of simplicity and pleasant texture. In the main, the tremendous flood of building of apartment houses and hotels that characterized the years from 1920 to 1927, produced little of outstanding architectural merit and almost nothing of peculiar novelty or interest.

Occasional exceptions, such as Andrew J. Thomas' great housing group on the Grand Concourse, New York, for the Rockefeller interests, only serve to make more obvious the average drab character of the product. Similarly, the construction of floods of speculative, small houses, particularly in Florida, and the suburbs of all the large cities, has produced results that are depressingly uninteresting and vary from the ill-considered boxes that cover sordid miles of Brooklyn and Queens in New York and the



suburbs of Detroit and Chicago, to the over-ornamented vulgarities of Florida and Hollywood.

Houses built for individual owners, on the other hand, are frequently of great distinction, although conservatism in style is general. The best of them have, however, escaped from the archaeology that was general up to the time of the World War. More and more it is becoming unimportant whether a house is colonial or French or English; it is primarily just house. As in the case of churches, the smaller and less expensive houses are frequently more convincing and have more of that style which comes from consistency, than the larger and more expensive types. Particularly worthy of study, as showing this trend toward simplicity and directness, are the houses of William Forster, Peabody Wilson & Brown, and J. C. McKenzie Jr., around New York; by Mellor & Meigs, Carl Ziegler, Robert McGoodwin, and Edmund Gilchrist near Philadelphia; and in southern California, by Donald McMurray, Reginald Johnson, and George W. Smith. The colonial adaptations of R. H. Dana, Jr., in Connecticut, are also admirable in their preservation of the simple and unsophisticated charm of the early buildings.

The most remarkable of all the recent houses in America are those of Frank Lloyd Wright, near Los Angeles. In these, there has been developed a new system of construction by means of pre-cast concrete tiles, set with reinforcing bars in the joints between them. By varying patterns upon these tiles, and by the contrast of plain and decorated units, walls of extraordinary interest are produced. Moreover, the houses are planned and composed with that unconventional genius so characteristic of their designer. In these houses, he seems, for the first time, to have achieved a material exactly suited to his continually growing skill. These most recent works of his lack the harshness and some of the mannered peculiarities of his earlier work, and are, nevertheless, instinct with vivid life. The true fire of creation has produced them; new materials put together by a great architect have produced a beauty that is new in the world.

Great Britain. Here, also, the flux of architectural taste is evident. Three influences are dominant in the urban work—the heavy baroque classicism of the early twentieth century, represented by many shops and office buildings on Regent and Oxford streets, London, in which the effort seems to be to crowd into one façade the greatest possible number of rustICATIONS, “cheese box” columns, broken pediments, cornices, and other classic enrichments; the influence of the more sober type of American monumental classicism, as illustrated in the Southport War Memorial, by Grayson & Barnish and A. L. McMillan, Associated, 1924; and particularly in the last three years, direct radical influence from the Continent, especially from Scandinavia, Germany, and Austria, as illustrated in the house “New Ways” in Northampton, designed by Behrens of Vienna, 1926.

All of these influences tend to merge with the characteristic English love of heavy scale and ornamental detail and richness of surface texture. A typical example of this merging is Adelaide House (an office building) in London, by Sir John Burnet, A.R.A., 1925. Britannic House (an office building), by Sir Edward Lutyens, R.A., 1925, shows the more Roman and classical phase of the movement; the Under-

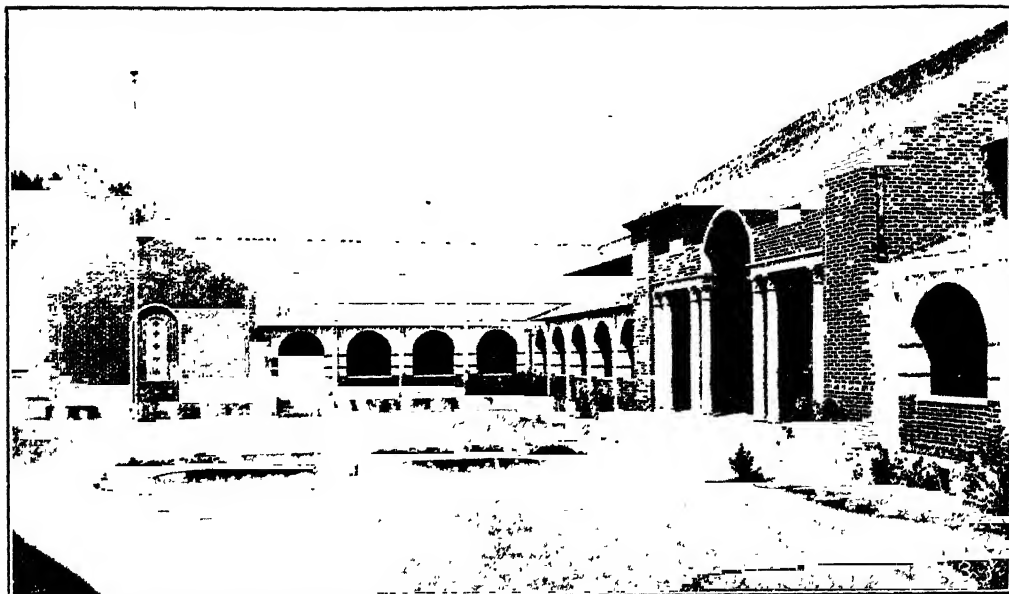
ground Electric Railway office building, London, by Adams, Holden & Pearson, 1927, with its receding masses shows strong American influence.

In ecclesiastical work, an entirely different development is going on, based upon daring simplifications of originally Gothic ideals of height and structural expression. It is a development apparently little affected by passing style fashions and produces, therefore, work direct, simple, dignified, and emotionally sound. The greatest monument of this movement is the completion of the choir and transepts of Liverpool Cathedral, by Sir G. G. Scott, 1924, whose lavish and rather sombre Gothic strikes a note of power that is new in Gothic building. Characteristic of the smaller churches, in which ornament is almost eliminated, and the simple masses allowed to speak for themselves, are those of St. Alphage at Hendon and the Roman Catholic Church of St. Michael at Ashford, the former by Nicholas Dixon-Spain, 1928, and the latter by Sir G. G. Scott, 1928.

In educational work, the Sutton Valence school in Kent, by Adams, Holden & Pearson, 1926, shows a simplicity of scheme and a directness of treatment similar to the ecclesiastical work. The war memorial chapel of Charterhouse School, by Sir G. G. Scott, 1927, is in a modernized Gothic. On the other hand, Ashburne Hall at the University of Manchester, by Thomas Worthington & Sons, 1925, and the impressive new group of college buildings at Bristol, by Oatley & Lawrence, 1925, both are closer to past tradition; the latter particularly interesting in its rich, Tudor Gothic treatment. The war memorial cloisters at Winchester School, by Sir Herbert Baker, 1924, are full of dignified charm and typically English twentieth-century freedom.

France. The Paris Exposition des Arts Décoratifs in 1925 was of tremendous importance, not only to France but also to the rest of the world. It brought into one focus all of the struggling radical design movements of Europe. Their combined effect produced eager excitement that radiated its influence far and wide. Since its occurrence, almost no architecture has been built in France uncolored by its shadow. With the customary French love of critical logic, the movement toward modernism in France has received extended critical examination and France, *par excellence*, has become the centre of the intellectualizing type of radical designers—the architects who design from theories, rather than from creative imagination, and trust that beauty will follow as inevitably as the correct mathematical answer follows from a geometric theorem. The square, uncompromising boxes of Jeanneret and Mallet-Stephens and the stark, harsh shapes of the Perretes are the result. But France also has always been the home of a strong and vital architectural tradition, as well as the continuing idea of beauty in exquisite and imaginative craftsmanship. In the best modern work, these two elements mitigate the starkness of purely intellectual designing. Thus, such churches as St. Louis at Vincennes, by Droz & Marrast, 1924, with great intersecting concrete arches and rich color decoration, are creations of valid beauty, and the great casino at Evian, by J. Hébrard, 1928, the country club, La Festa, at Monte Carlo by C. Letrosne, 1928, and the Municipal Stadium at Lyon, by Tony Garnier, 1926, despite the radical character of their detail are all in the best vein of traditional French design.

## ARCHITECTURE



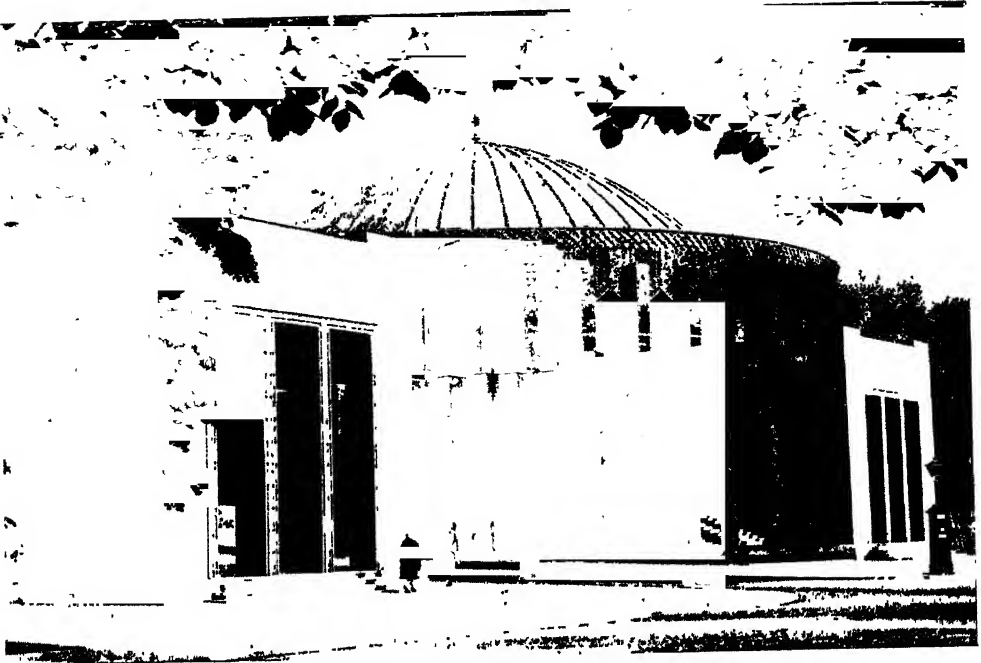
**GRAMMAR SCHOOL NO. 2  
GLENDDORA, CALIFORNIA**  
Allison & Allison, Architects



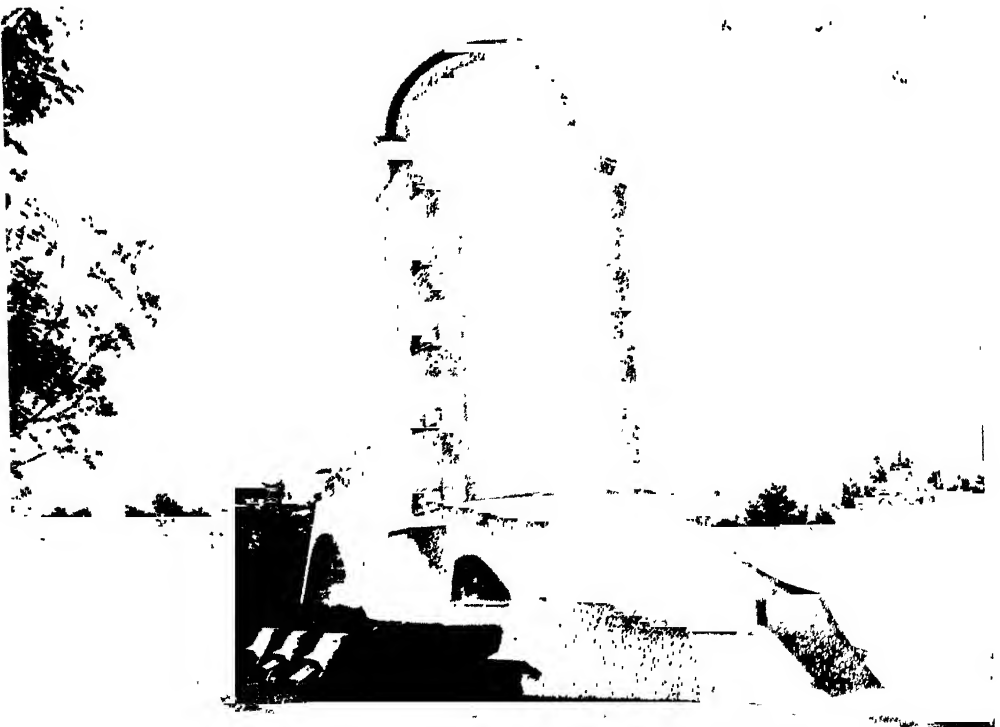
*Photograph by Hiram Myers*

**CHURCH OF THE HEAVENLY REST  
NEW YORK CITY**  
B. G. Goodhue Associates, Architects

ARCHITECTURE



RHEINHALLE CONTAINING THE PLANETARIUM AT THE  
DÜSSELDORF EXPOSITION  
Wilhelm Kreis, Architect



*Photographs from German Tourist Information Office, New York*

THE EINSTEIN TOWER NEAR BERLIN  
Erich Mendelsohn, Architect

MODERN GERMAN ARCHITECTURE

A similar imaginative freedom is visible in the *Hôtel de l'Intransigeant* at Paris by P. Sardou, 1925, and in the alterations of the *Galleries Lafayette*, by F. Chanut, 1927. Such small shops as the food shop Corcellen and that of Roger & Gallet, both by M. Marrast, 1924, continue the tradition of exquisite combination of rich materials. Similarly, the theatre of the Michodière, by Bluysen, 1927, and the *Moulin Rouge*, by Thiers, Forest & Nibodeau, 1925, both continue the tradition of lavish entertainment halls characteristically Parisian. The *Salle Pleyel*, by Auburtin, Grasset & Mathon, 1928, combines one enormous concert hall and two smaller recital halls in a plan of great brilliance. The exterior, with its great rectangular windows and octagonal openings above, is a lovely composition of unforced novelty. The interior of the great hall, with its sweeping, curved lines, has aroused much discussion. It is a form basically without scale, and even the lovely frieze around the bottom, by Jaulmes, cannot swing the vast, egg-shaped interior.

The contributions of France to the world-wide change in taste have been enormous; first of all, through the development of a theoretical, critical basis, and secondly, through the continued excellence of its decorative craftsmen, that make its metal work, its furniture, and its textiles an inspiration to all the world. In addition, the close connection of sculpture and architecture remains a dominant element, as in the monument of the heroes of the Dismude, by Roux Spitz, 1925.

**Germany and Austria.** It is in Germany and in Austria that the sway of this new type of design is most complete, perhaps because the overturn, due to the War, was there most deeply felt. Up to the time of the War, German architecture was largely controlled by court taste; since the War, it is basically industrial and financial. This has meant that the problems faced are new problems and the style most fitted to them, a new style. In factory design, for instance, Germany has led the world, and the idea of putting all the varied buildings of a modern, industrial plant into one architectural composition, with creative beauty as well as engineering efficiency, is purely a German idea. The hat factory of Steinberg, Hermann & Co., near Berlin, by Eric Mendelssohn, 1923, is typical, with its spacious cool interiors and its central building that distantly recalls the shape of a felt hat. Even more interesting is the factory layout for the manufacture of gasoline motors designed by Walter Gropius for the Industrial Exposition at Cologne as long ago as 1914; a more conventionally detailed, but equally boldly conceived, scheme is the bindery of the Ullstein A. G. at Tempelhof, Berlin, by E. C. Schmohl, 1927. The simplicity of Emil Fahrenkamp's storage warehouse at Nuremberg, 1924, has a remarkable, monumental character. In none of these cases, as too often in America, is a head office building made architecture, with the rest of the group sprawling thoughtlessly behind, but the whole is organized into one aesthetic unit. Even mine heads are similarly organized into architecture, as in the Koenigsborn Mine at Unna, by Alfred Fischer, 1924.

A similar novelty controls the commercial work. In Hamburg, the usual exterior material, brick, has been allowed to dictate exterior detail; the result is such interesting, if eccentric, forms as those of the Chilehaus, by Fritz

Hoeger, 1924, or his cigarette factory at Wandsbek, 1927. Elsewhere, a more radical tendency is evident in the sharp balance of vertical and horizontal lines, with little or no ornament, as in the Stuttgart shop by Eric Mendelssohn, 1928, or in the high building in Cologne by J. Koerber, 1925.

In work of a more monumental character, there is naturally greater restraint and frequently a distinct element of nationalistic tradition. Thus, several recent Bavarian post offices—Kirchenlamitz, by Erhard; Schaftlach, by Holzdammer; and Mainburg, by Grimm, all 1927, while without archaeological copying, use the traditional Bavarian steep roofs, and the Finance Ministry Building at Breslau, by Allescher, 1928, is distinctly neo-baroque in character. The Stuttgart railway station by Bonatz & Scholer, 1913-1927, is a remarkably dignified example of monumental design without definite stylistic detail. A somewhat similar attempt to achieve monumental effect, without classic detail, characterizes the buildings of several of the expositions that have been held annually in Germany. The permanent brick buildings of the Dusseldorf Exposition, 1926, by W. Kreis, are particularly successful; the Planetarium, with its dome top and deeply projecting buttresses, is one of the most effective examples of its type that has yet been built. The Tannenberg War Memorial at Hohenstein, by Walter and Kreuger, 1927, produces its effect by stark size. The contrast between this war memorial and such a pre-war monument as the Voelkerschlachts Denkmal at Leipzig, with its diabolic gigantism and brutally powerful figures, reveals the essential soundness of the newer work.

It is, however, in the field of group housing that German design is preëminent. Each development is conceived as a whole with all the necessary play spaces and reserved areas as essential parts; the widest variety of plan types is found, carefully considered from the point of view of picturesque appearance and variety, as well as sunlight and prevailing winds. The individual houses are frequently less attractive than the schemes as a whole; often the sterilizing touch of doctrinaire cubism is evident. In other cases, however, simple directness of design has produced beauty, as in the housing group for the Berlin street railway employees at Tempelhof, by W. Borchard, 1924, or in a group of smaller houses, the development at Zehlendorf-West, by Mebes & Emmerich, 1924.

**Austria.** It is also housing which forms the outstanding note of recent Austrian architecture. In this work, the influence of Josef Hoffman—one of the most brilliant of twentieth-century architects—is strong. Particularly noteworthy are large apartment-house groups in Vienna, in which free charm of layout and material is combined with a distinct urban character. Such housing groups are more than mere machines for living; they become works of art. Of several groups, that at Fuchsenfeldhof, by Schmidt & Aichmeyer, 1925, may be cited as most perfectly combining traditional Viennese romanticism with twentieth-century economy. Of Hoffman's own work, the most characteristic was the Austrian Building at the Paris Exposition des Arts Décoratifs, 1925, with its fresh, refined, and delicate use of large scaled, horizontal moldings.

**Italy.** Architectural taste in Italy seems still chaotic; three different and conflicting tendencies are at work—the ancient Roman, the

baroque, and the extremely revolutionary. The Italian Building, by Brasini, at the Paris Exposition of 1925 was typical of this; a heavy modernism was imposed upon gigantic Roman details. Similarly, the Supercinema at Rome, by Foschini & Spaccarelli, 1927, shows the same combination, while the apartment houses at Milan, by Broglio, 1925, and the Ambassador Hotel in Rome, by Piacentini & Vogt, 1927, show the baroque influence dominant. The ultra-modern work is almost always harsh and bizarre, without either the theoretical basis of French cubism or the inventive charm of the best north European work.

**Other Countries.** If a similar general search for new forms expressive of modern life dominates architecture throughout Europe, different countries have found different individual expressions. Thus, in Holland, horizontal lines and horizontal projections dominate design and interestingly original combinations of reinforced concrete and brick are used. The influence of Frank Lloyd Wright is everywhere evident. Work is almost universally vital and imaginative, although frequently experimental and unsure. Characteristic examples are apartment houses in Amsterdam, by P. Kramer and M. de Klerk, and especially the post-office building at Utrecht, by J. Crouwel, Jr., 1925, remarkable for its use of hyperbolic arches in the main hall.

In Scandinavia, the modernism is much colored by traditional late Renaissance classicism. Restraint and charm are the chief merits of this work. The concert hall and the Enskilda Bank, both in Stockholm and both by Ivor Tengbom, 1925, are typical. Very characteristic, also, are numerous simple church buildings by Tengbom and others, that are picturesque, true to Scandinavian type, and yet stimulating in their fresh treatment of every form.

Outside of Europe, the most important architectural work not already noted is the gradual building of the new capital at Delhi, India, by Sir E. Lutyens and Sir H. Baker. This group is lavishly planned on a great monumental scale and daringly attempts to build an æsthetic harmony by the combination of classic and native Indian forms. Particularly imaginative are the Secretariat buildings, under construction in 1929; the legislative building, with its immense, circular colonnade, is both less daring in conception and less interesting in mass.

**League of Nations.** The drawings submitted in the League of Nations competition in 1927 proved the chaos of architectural taste in Europe. Every type of taste was represented, from the most severe classic through the wildest baroque, to uncompromising and doctrinaire mechanism. As a first result, first prizes were distributed broadcast, obviously with regard to political sensibilities as much as architectural achievement. After further careful study of the prize winning designs, the committee finally decided to appoint, as architects, the Paris firm of Nénot & Flegenhimer, whose design was one of the least radical in the competition, with a carefully studied plan, and a straightforward, classic style in the exterior. The choice of such a conservative design will be much criticized, but was undoubtedly the safest decision; to experiment at the cost of the League of Nations in buildings that should be the most dignified in the world and should stand for at least a century, would have been a dangerous course.

**ARCTIC REGION.** See POLAR RESEARCH.

**ARGENTINA**, ār-jěn-tě'ná. A South American republic lying on the eastern coast of the southern part of the continent, consisting of 14 provinces, 10 territories, and one Federal district. Its area is 1,153,119 square miles and its population (Jan. 1, 1927), 10,648,814, as compared with the census figure of 1914 of 7,885,237. The populations of the larger cities were estimated thus in June 1927: Buenos Aires, 2,030,765; Rosario, 410,000; Córdoba, 200,000; La Plata, 169,000; Tucumán, 122,000. Because of the annual return of Spanish and Italian laborers to their homes after the harvests, immigration and emigration almost balanced, the numbers in 1917 being 51,665 immigrants to 83,999 emigrants; in 1919, 69,879 immigrants to 67,710 emigrants; in 1920, 188,688 immigrants to 148,907 emigrants; in 1926, 113,352 immigrants to 159,448 emigrants. Before the World War, non-Latin immigration amounted to only 13 per cent of the total. Since the War, this proportion has increased rapidly. It was 19.6 per cent in 1922, 25.2 per cent in 1923, and 30 per cent in 1926. The chief sources of the new immigration are Poland, Russia, Jugo-Slavia, Czechoslovakia, and Lithuania.

**Agriculture.** Because of the virgin fertility of the soil, the food-crop harvests have been bountiful, with the result that Argentina in late years has led the world in the exportation of maize, as well as linseed, and stands next to the United States and Canada in the exportation of wheat. The danger of sapping the soil is always real, and the Government is wisely applying itself to teaching the advantages of a more varied husbandry and intensive cultivation. This fact, together with the higher prices during the War, resulted in an increasing application to cotton, tobacco, and sugar-cane culture. In July, 1928, the President of the Republic stated that the area planted to wheat, linseed, oats, barley, birdseed, and corn increased in 1927-28 to 17,338,000 hectares, an area 623,000 hectares larger than the plantings in the preceding year and 4,372,645 hectares greater than in 1922. Exports of wheat, linseed, oats, barley, rye, and corn, which were 9,373,046 tons in 1926, rose to 15,501,694 tons in 1927.

The grazing industries of course stand next to agriculture in prominence. In 1920, the last year for which complete figures were available, there were 37,064,900 cattle (29,116,625 in 1908); 9,432,400 horses (7,531,376 in 1908); 912,800 asses and mules (750,125 in 1908); 36,209,000 sheep (67,211,754 in 1908); 4,819,800 goats (3,945,086 in 1908); 1,436,600 pigs (1,403,591 in 1908).

**Industry.** By the latest industrial census, that of 1920, 48,779 factories, employing 410,201 persons, with a capital of 1,787,662,000 pesos, were enumerated. The value of manufactured products was 1,861,789,710 pesos (\$782,000,000). The most important single industry was that of food production; 19,000 establishments were engaged in it. Packing plants, and meat refrigeration, flour-mills, creameries, and wool-washing plants were at the head.

**Mining.** This industry has reached no great importance. Control of the mines is vested in the state and national governments, and concessions are strictly regulated. Petroleum is the most important of the products mined, the output in 1927 being 8,726,000 barrels. During the War, wolfram and mica were in considerable demand.

Commerce. The total foreign trade of Argentina in recent years is shown below. The figures given represent the real, rather than the nominal, value adopted for tariff purposes and are stated in gold pesos with a par value in United States money of 96.5 cents per peso. In 1919 the average exchange value of the gold peso was \$.90; in 1920, \$.907; in 1921, \$.731, in 1922, \$.818; in 1927, \$.9630.

COMMERCE  
(In Gold Pesos)

Year	Imports	Exports
1913	496,230,000	519,160,000
1919	655,772,000	1,070,965,000
1920	934,968,000	1,044,085,000
1922	686,000,000	672,600,000
1927	856,804,000	1,009,326,000

The chief articles imported are textiles, iron and steel, glassware and crockery, foodstuffs, oils, chemicals, timber and wood, and coal. The exports are chiefly foodstuffs, including wheat, corn, frozen beef and mutton, linseed, hides and skins, wool and quebracho. The United States holds a commanding position in Argentina's import trade, while the United Kingdom is the best customer for Argentine exports. The trade with the more important countries for 1913 and 1926, the latest year for which details were available, are given in thousands of dollars.

TRADE WITH PRINCIPAL COUNTRIES  
(Thousands of Dollars)

Country of origin or destination	Imports for consumption	Domestic exports
	1913	1926
Total	492,456	757,931
United States	72,458	186,886
Brazil	10,815	38,952
Paraguay	2,653	7,909
Belgium	25,643	36,138
France	44,475	55,836
Germany	83,296	86,095
Italy	40,636	68,216
Netherlands	4,759	8,829
Spain	14,472	17,685
Sweden	2,649	4,859
United Kingdom	152,883	146,432
Shipments for orders		
		116,822
Per cent of total:		
United States	14.7	24.7
Belgium	5.2	4.8
France	9.0	7.4
Germany	16.9	11.4
Italy	8.3	9.0
United Kingdom	31.0	19.3

Communications. On Jan. 1, 1928, the length of railways open to traffic was 22,791 miles, of which 4418 miles belonged to the State and 18,373 miles belonged to private companies. In 1927 the total receipts of both the State and privately owned lines were 146,840,800 gold pesos as against 137,942,400 in 1926. In 1927, 154,687,000 passengers and 49,471,000 metric tons of freight were carried. The capital invested in 1925 amounted to 1,276,843,316 gold pesos. In 1926 there were 3939 post offices, 203,502 miles of telegraph wire, 675,258 miles of telephone wire, and 204,463 instruments in use. There were 266,030 motor vehicles registered in 1927. In the same year, the air line between Buenos Aires and Montevideo was abandoned. In 1927,

3378 vessels of 11,864,000 net registered tons entered the ports of the Republic.

Finance. The budget charges, in paper pesos, for 1912 and 1927, were as follows, one paper peso equaling 44 centavos gold money:

Year	Revenue	Expenditure
1912	128,751,718	248,764,942
1927	655,558,588	651,934,237

As reported to Congress on June 28, 1928, the consolidated internal debt on Dec. 31, 1927, was 1,051,697,962 pesos, as against 957,421,027 pesos on Dec. 31, 1926. Foreign loans to the amount of 253,205,636 pesos were issued during 1927 and 37,809,250 pesos were amortized, making the foreign debt at the end of 1927 total 1,103,820,137 pesos. The floating debt was reduced from 655,488,630 pesos on Dec. 31, 1926, to 408,440,376 pesos on Dec. 31, 1927. In addition to the latter sum, however, the Government recognizes a debt of 40,000,000 pesos arising from differences in exchange in connection with the cancellation of the English loan of 1920.

Education. Statistics published in 1928 showed 10,608 public elementary schools in charge of 45,271 teachers, with an enrollment of 1,302,534 pupils. There were 44 national secondary schools with an enrollment of 15,111 pupils, and 84 normal schools with an enrollment of 13,997. The five national universities, the universities of Buenos Aires, La Plata, Córdoba, the Litoral, and Tucumán, had a total enrollment of 15,843 students. The 1929 budget provided for expenditures of 147,707,756 pesos for the Ministry of Justice and Education.

Defense. In 1910, two dreadnaughts were laid down in American yards. These, finished in 1917, were the *Moreno* and *Rivadavia*, both of 27,940 tons displacement and capable of 23 knots per hour. For 1929, the military budget was 67,587,321 paper pesos and the naval budget 46,816,045 paper pesos. See NAVAL PROGRESS.

History. The period of the War saw Argentina confronted by local problems in many ways analogous to those of the United States. The conflicting sympathies of the foreign-born population, many of whom returned to their native lands to fight in the armies; the active Allied and German propaganda; the rising cost of living; and the increasingly articulate character of labor, which expressed itself in strikes and disturbances; all added to the vexations of the Government and distracted attention from matters which had hitherto been Argentina's main concern, i.e., its economic expansion and development. In 1917 a general railway strike temporarily paralyzed business and sporadic strikes continued throughout 1918 and 1919.

Argentina's rôle as a neutral was made difficult in 1917 by the intensification of the German submarine campaign and the subsequent arrogance displayed by the German Foreign Office. The famous *spurious versenkt* despatch of the German Ambassador, which the papers published on Sept. 8, 1917 ("I advise that they [Argentina's ships] be sunk without trace"), brought matters to a head and, after serious anti-German disturbances in Buenos Aires, the Argentine Congress voted for the severance of diplomatic relations. But the President refused to act and, in spite of the entry of the United States into



the War, Argentina remained aloof from the struggle.

In 1910 Roque Saenz Peña was elected President, and on his death in 1914, the Vice President, de la Plaza, continued the term. In 1916 a split in the governing party caused the election of Hipólito Irigoyen, the Radical candidate, and Argentina viewed an administration of hitherto unknown men. Leaders in the new party included Honorio Pueyrredon, Diego Luis Molinari, Elpidio Gonzáles, and Alfredo Demarchi. Business men and technicians were appointed to important offices, and civilians held the war and navy portfolios. In the congressional elections of 1919, both houses remained Radical. The President's known sympathies for labor threw him into many difficulties, notably with the foreign-owned public-service corporations. His able administration and his success in maintaining Argentina's neutrality won universal recognition for his talents. In 1922 Marcelo T. de Alvear, likewise of the radical party, was elected President.

The six years of Dr. de Alvear's administration were marked by continued internal development and harmonious foreign relations. The fiscal situations presented one of the biggest problems. Large annual deficits had to be funded—that for 1922 alone being 90,000,000 paper pesos—and the floating debt had to be consolidated. For these and other purposes, Argentina turned to the United States for a succession of large loans, advanced not only to the National Government but to city and provincial governments as well. Some of these loans, such as a \$50,000,000 loan of 1921, one for \$27,000,000 in 1922, and one for \$55,000,000 in 1923 were short-term loans, made for the purpose of meeting current fiscal or refunding needs, but many were for longer periods. Among the latter were two loans in 1924, for \$40,000,000 and \$30,000,000, respectively; two in 1925, for \$45,000,000 and \$29,700,000; two in 1926, for \$20,000,000 and \$16,000,000; two in 1927, for \$27,000,000 and \$21,200,000; and one in 1928 for \$20,000,000. All these were made to the National Government to run 34 years in each case, and all called for 6 per cent interest except the last, which was floated at  $5\frac{1}{2}$  per cent. Besides these, there was one loan of \$40,000,000, \$31,325,000 of which was taken in the United States to run for thirty-three years at 6 per cent, made in 1927. Although new tax measures were proposed from time to time, such as increased income taxes, higher land valuations, etc., deficits continued to be met from year to year from the proceeds of these foreign loans and from unexpectedly large current revenues due to bountiful returns from the country's leading industries, and under President de Alvear's direction the fiscal situation steadily improved. The basic soundness of the country's finances, in spite of temporary stringencies, made it possible for the Government to plan ambitious public works and large military and naval programmes. On Aug. 27, 1927, the Conversion Office was reopened and the gold standard was reestablished on the basis of 44 centavos gold per paper peso.

Strenuous opposition was aroused by the Government's attempt to put into effect a workers' pension law hastily passed in December, 1923. It called for contributions from both employer and employee and met the strong disfavor of both. Widespread strikes and lockouts caused postponements in 1924, and in the following

year the law was suspended. In 1926 it was repealed altogether. A strike of dock workers in the summer of 1924 caused much inconvenience. Among the pleasant social events of this period was the visit of the Prince of Wales in August, 1925. The senate appropriated 400,000 pesos to defray the expenses of an official programme and during his three weeks' stay he was royally entertained. A disagreement between the Government of Argentina and the Vatican, which caused strained relations for several years, arose in March, 1924, when the Vatican refused to ratify the appointment of Mgr. Michele de Andrea as Archbishop of Buenos Aires. This appointment, in accordance with the usual custom, had been recommended by the Argentine government, and President de Alvear insisted that it should be carried through.

The controversy brought other disagreements in its train and at one time proposals were presented in Congress for the full separation of Church and State. The Argentine Minister to the Vatican was recalled, and in January, 1925, the Government announced to the Vatican that the Papal Nuncio, Mgr. Giovanni Beda Cardinale, was persona non grata. He was replaced, but the original disagreement continued. Although Mgr. de Andrea withdrew from his candidacy for the position of Archbishop, the President refrained from nominating anyone else until October, 1926, when his selection of Mgr. Fray Bottaro brought the matter to a close.

The Government continued to give active attention to internal development plans, particularly the building of roads, lack of which has been a big handicap. Cotton growing made great strides and Argentina reached the point of being listed as one of the world's exporters of cotton. Immigration was sufficient in the main to supply needed labor, although there was difficulty in inducing laborers to move out of the cities into the agricultural regions where they were most needed.

Following the restriction measures adopted in the United States, it was expected that the immigrant tide would turn strongly toward Argentina, but this proved not to be the case. The high tide of immigration was reached in 1923, when 250,000 immigrants entered the country. The need for permanent, rather than migratory, settlers was strongly felt. It led to the formation in 1927 of a "Railway Colonization Consortium" by the principal railway systems, a company organized to acquire and improve unoccupied lands and sell them to settlers on highly favorable terms. It received the hearty support and aid of the Government and before the end of the year had settled two small colonies from Europe.

In its foreign relations following the War, Argentina's history was uneventful, which means that for the most part they were entirely harmonious. Argentina was the first country to ratify the League of Nations Covenant (July 7, 1919), but it withdrew from active participation in the following year when the League failed to adopt a number of changes it recommended. For many years thereafter, the country was half within, half outside, the League. It did not send delegates to Geneva or take part in the major activities of the League, but desultorily kept up its payment of dues. President de Alvear was friendly toward the League and urged closer relations, especially after the admission of Germany in 1926, but the influence of the pre-

ceding administration was sufficient to prevent full adhesion.

The world-wide agitation attending the execution of Sacco and Vanzetti in the United States was reflected in Argentina in the form of demonstrations and strikes of protest. In December, 1927, two American branch banks were bombed, presumably because of the strong anti-American feeling aroused by the execution. The passage of the Fordney-McCumber Tariff Act also brought in its train much irritation in Argentina. This feeling became pronounced when the United States proposed to send a commission to the country to investigate costs of production of corn and flaxseed. Diplomatic representation ensued and the visit of the commission was cancelled. The feeling against the United States was deepened by the quarantine against Argentine cattle and sheep because of foot-and-mouth disease. The intervention of the United States in Nicaragua provoked strong expressions against North American imperialism.

At the Sixth Pan-American Conference at Havana in January and February, 1928, Argentina took the lead in urging an unconditional declaration against the intervention of any country in the internal affairs of another. The United States insisted that the declarations should be qualified. Dr. Honorio Pueyrredon, chairman of the Argentine delegation, took a firm stand also in favor of a Pan-American agreement looking toward mutual tariff concessions, but when his Government failed to support him, he resigned as chairman of the delegation and also as Ambassador to the United States. When the Pan-American Conference on Arbitration and Conciliation met in Washington in December, 1928, Argentina was the only country not represented, and it alone did not sign the treaties agreed upon at the Conference.

The presidential elections held in April, 1928, brought out a heavy vote. The main division of the electorate was into "Personalistas," and "anti-Personalistas," or adherents and opponents of former President Irigoyen, who was again a candidate. The result of the election reflected the intense devotion of his following, 240 out of 376 electoral votes being cast for him. He was known as unfavorable toward the existing League of Nations and in the fall the budget item for the payment of League dues was eliminated. On taking office in October, 1928, he resumed his work of reform where he had laid it down six years before. He moved vigorously against official corruption, particularly in the provincial governments. In the provinces of Mendoza and San Juan, he removed the heads of the government and took over their duties himself. Late in 1928, the Government published correspondence with Great Britain over the installation of a wireless plant by Argentina on the South Orkney Islands, the British protesting that Argentina should first have received British permission. The correspondence reopened the long-standing differences over the ownership of the islands, Argentina claiming not only these but the Falkland Islands as well. In December, the nation formally welcomed President-elect and Mrs. Hoover on their South American tour. The year 1929 was marked by a strong agitation against the high tariffs of the United States, which it was feared might be raised still higher by the new administration. There was much sentiment in favor of a tariff war against the United States.

**ARGENTINE ANT.** See ENTOMOLOGY, ECONOMIC.

**ARIZONA.** The fifth of the United States in size (113,956 square miles) and the forty-fifth in population; capital, Phoenix. The population of the State increased from 204,354 in 1910 to 334,162 in 1920, a gain of 63.5 per cent; estimated population, 1928, 474,000. The white population increased from 171,468 (1910) to 291,449 (1920), while the Negro population increased from 2009 to 8005, and the Indian population from 29,201 to 32,089. The Chinese in 1920 numbered 1137, against 1305 in 1910; the Japanese, 515, against 301. The native white population increased from 124,644 to 213,350, while the foreign-born whites increased in number from 46,824 to 78,099. The urban population rose from 63,200 to 117,527, the rural, from 141,094 to 216,635. The largest cities in the State are Phoenix and Tucson. The population of the former increasing from 11,134 to 29,053, while the population of the latter grew from 13,193 to 20,292.

**Agriculture.** Agriculture is not the leading industry in Arizona, nor did the agricultural development of this State keep pace with the growth of its population. While the increase in population from 1910 to 1920 was 63.5 per cent, the number of farms in the State increased only 8.1 per cent, or from 9227 to 9975. The farms in Arizona in 1925 numbered 10,802. It should be noted that in 1910 individual schedules were secured for farms on Indian reservations, whereas in 1920 in a number of cases where the farming operations of a reservation were returned on a single schedule, the reservation was recorded as one farm, a difference of at least 2000 farms being thus accounted for. The land in farms increased from 1,246,613 acres in 1910 to 5,802,126 in 1920 and 11,065,291 in 1925. The improved land acreage also showed a considerable increase, from 350,173 (1910) to 712,803 (1920). The total value of farm property made an apparent increase of 210.9 per cent, from \$75,123,070 (1910) to \$233,592,989 (1920), but declined thereafter to \$194,048,696 in 1925. The average value per farm rose from \$8142 (1910) to \$23,418 (1920), but fell to \$17,964 in 1925. In interpreting these values, the general price inflation up to 1920 and the succeeding deflation are to be taken into account. The index number of prices paid to the producers of farm products in the United States was 104 in 1910 and 216 in 1920. The proportion of land used for agriculture in 1910 was 1.7 per cent; in 1920, 8 per cent; in 1925, 15.2 per cent. The percentage of farm land improved decreased from 28.1 (1910) to 12.3 (1920). Of the total number of farms in 1925, 8179 were operated by owners; 2327, by tenants; and 296, by managers. The greater proportion of farmers in Arizona are native. In 1920 there were 8262 native, and 1067 foreign-born, white farmers. Of a farm population of 71,954 in 1925, 48,820 were white; the remaining 23,134 were mostly Indian. Of 8179 farms operated by owners, 3276 (or 40.1 per cent) were under mortgage in 1925. Those under mortgage numbered 3380 (1920) and 1043 (1910). Arizona is one of the most important States in live-stock production. In 1925 cattle numbered 1,068,727, as compared with 821,918 in 1920. Sheep increased to 1,163,905 from 881,914. Arizona is one of the most arid States and its possibilities for agriculture are controlled almost entirely by the development

sion; Steward Observatory; State Museum; and Arizona Bureau of Mines; and a college of education, which was organized in 1922. In common with other Western universities which have concerned themselves primarily with local needs, both cultural and industrial, the University of Arizona, located in the midst of copper resources, has developed a school of mines, with copper specialists as instructors, to further the leading industry of the State, which also furnishes three-fifths of the American output. Other problems which have engaged the attention of the university concern irrigation, certain types of dry farming, and plant adaptation to climatic and soil conditions. President, Homer LeRoy Shantz, Ph.D., Sc.D.

**ARKANSAS**, *är'kan-sa*. The twenty-sixth of the United States in size (53,335 square miles) and the twenty-fifth in population; capital, Little Rock. The population of the State increased from 1,574,449 in 1910 to 1,752,204 in 1920, or by 11.3 per cent; estimated population, 1928, 1,944,000. The white population increased from 1,131,026 (1910) to 1,279,757; the Negro, from 442,891 to 472,220. The population of Arkansas is very largely native. The native whites numbered 1,265,782 in 1920 as compared with 1,114,117 in 1910, while the foreign-born population decreased from 16,909 to 13,975. The urban population rose from 202,681 to 290,497, while the rural increased from 1,371,768 to 1,461,707. The largest cities in the State are Little Rock and Fort Smith. The population of the former increased from 45,941 in 1910 to 65,142 in 1920, and that of the latter from 23,975 to 28,870.

**Agriculture.** As Arkansas is an important cotton-growing State, agricultural conditions have been affected, as in the case of other Southern States, by the devastations of the boll weevil. For a detailed account of the influence of the weevil on agriculture and cotton growing, see *ENTOMOLOGY, ECONOMIC*, under *Boll Weevil*. In 1923 in certain districts of Arkansas, the leaf worm defoliated 95 to 98 per cent of the plants, which dried up, and the immature bolls produced practically no crop. The boll-weevil attack, however, was less than in 1922, because conditions were less favorable for the insect. There followed a practice in 1924, 1925, and 1926 of increasing the acreage planted to cotton year by year, so that production actually rose. In 1913 such area was 2,502,000 acres and the production, 1,073,000 bales; in 1921, 2,382,000 and 797,000; in 1922, 2,844,000 and 1,040,000; in 1923, 3,020,000 and 622,000; in 1924, 3,094,000 and 1,094,000; in 1925, 3,738,000 and 1,600,000; in 1926, 3,782,000 and 1,620,000.

While the population of Arkansas increased 11.3 per cent in the decade 1910-20, the number of farms increased 8.4 per cent, or from 214,678 to 232,604. It thereafter fell to 221,991 in 1925. In 1910 the acreage in farms was 17,416,075; in 1920, 17,456,750; and in 1925, 15,632,439. The improved land in farms increased from 8,076,254 acres (1910) to 9,210,556 acres (1920), or 14 per cent. The total value of farm property apparently increased from \$400,089,303 in 1910 to \$924,395,483 in 1920, and thereafter declined to \$540,727,221 (1925); the average value of farm property rose from \$1864 (1910) to \$9974 (1920) and fell to \$2833 (1925). In interpreting these values and, indeed, all comparative values at the period involved, the inflation of the currency in years prior to 1920 is to

be taken into account. The total percentage of land used for agricultural purposes was 51.8 per cent in 1910, 51.9 per cent in 1920, and 46.5 in 1925. The percentage of improved land increased from 46.4 (1910) to 52.8 (1920). Of the 221,991 farms in 1925, 95,476 were operated by owners, as compared with 112,647 in 1920; 616, by managers, as compared with 730; 125,899, by tenants, as compared with 110,221. There was thus a marked decrease of owners and a less extensive increase of tenants. The white farmers in 1920 numbered 160,322 and in 1925, 158,708; colored farmers, 72,282 in 1920, decreased more sharply to 63,283 in 1925. The farms free from mortgage in 1920 numbered 64,881; in 1910, 82,321. Those under mortgage numbered 33,990 in 1920, as compared with 22,374 in 1910. Farmer owners reported as under mortgage debt in 1925 numbered 31,410. In 1925 the total number of cattle in the State was 810,156; in 1920, 1,072,966; sheep numbered 100,159 in 1920 and 51,156 in 1925. The estimated production of the chief farm crops in 1927 included corn, 36,575,000 bushels; wheat, 322,000; oats, 4,140,000; rice 7,438,000; potatoes, 1,972,000; sweet potatoes, 4,408,000 bushels; and hay, 876,000 tons. Comparative figures for 1913 are corn, 47,025,000 bushels; wheat, 1,313,000; oats, 6,360,000; rice, 3,769,000; potatoes, 1,800,000 bushels; and hay 384,000 tons.

**Mineral Production.** Arkansas, recently becoming one of the more important of the mineral-producing States, has mineral resources of great value. The most notable feature of the mineral production of the State was the development of the petroleum field. The results of this development on a large scale were shown only as late as 1921, since previous to that time the reports of production were included with those of other States. In 1921 the oil production had reached 10,473,000 barrels, valued at \$12,746,000; and this increased to 40,179,000 barrels for 1927. Coal mining ranked second in importance, until exceeded by the natural-gas output. In 1914 coal production was 1,836,540 tons, valued at \$3,158,168; in 1916, 1,994,915 tons, \$3,836,845; 1918, 2,227,369 tons, \$8,172,376; 1920, 2,103,596 tons, \$9,592,000; 1921, 1,227,777 tons, \$5,360,000; 1927, 1,548,834 tons, valued at \$5,393,000. Arkansas is chief among the States producing bauxite, from which aluminium is taken. The production in 1914 was 195,247 long tons, valued at \$976,686; 1916, 375,910 long tons, \$2,011,590; 1920, 481,279 long tons, \$2,897,892; 1921, 124,850 tons, \$755,400; 1927, 303,830 tons, \$1,892,860. The total value of the mineral products of the State increased from \$5,787,199 in 1914, to \$14,081,691 in 1918 and \$84,485,672 in 1926. Natural-gas production in 1926 was 43,566,000 M cubic feet, valued at \$5,817,000.

**Manufactures.** Arkansas is not an important manufacturing State, but there was a substantial increase in its industrial development in recent years. The number of establishments in 1909 was 2925; 3123 in 1919; 1257 in 1925; and 1146 in 1927; while the number of persons engaged in manufactories in those years was 51,730, 58,202, 43,977, and 40,032, respectively. The capital invested in 1909 amounted to \$70,174,345; in 1914, \$77,162,485, and in 1919, \$138,817,974. The monetary value of the products increased from \$74,916,367 in 1909, to \$200,312,858 in 1919, and was \$195,208,000 for 1925, and \$182,750,871 for 1927. The increase about 1919 was due in great measure to the

changes in industrial conditions brought about by the War. The principal industries, with the value of their product, in the three census periods, were as follows: Lumber and timber products, 1909, \$40,640,000; 1919, \$91,852,000; 1925, \$73,357,576; cottonseed oil and meal, 1909, \$7,789,000; 1919, \$25,304,000; and 1927, \$15,252,000; car construction and repair, 1909, \$4,154,000; 1914, \$4,971,000, and 1919, \$11,030,000; rice cleaning and polishing, 1909, \$945,000; 1919, \$8,996,000; and 1925, \$10,449,266. The most important manufacturing cities of the State are Little Rock and Fort Smith. The former had 125 manufacturing establishments in 1909, 149 in 1914, and 242 in 1919; the value of their products was \$6,882,000, \$7,755,000, and \$23,168,000, in those respective years. Fort Smith, in 1909, had 83 manufacturing establishments, 103 in 1914, and 115 in 1919; the value of the products for those years was \$3,739,000, \$4,646,000, and \$14,813,000, respectively.

**Education.** Educational conditions in Arkansas have made notable improvement during recent years. Important local legislation was enacted from time to time; and several important commissions and associations carried on work with excellent results. The Arkansas Illiteracy Commission undertook to give adult illiterates in the State the opportunity of at least learning how to read and write; and the School Improvement Association was exerting its force in the life of many schools and communities in the State. In 1923 there were over 600 organized school-improvement associations, with a membership of approximately 15,000. The Legislature of 1919 passed a measure accepting the provisions of the Smith-Hughes Federal Act, providing for vocational education. The enrollment in the schools increased from 395,978 in 1910 to 446,525 in 1916 and to 496,927 in 1925-26, while the average daily attendance increased from 255,135 in 1910 to 292,750 in 1916 and 349,657 in 1925-26. The biennial survey of the Bureau of Education showed for 1925-26 an enrollment in the elementary and kindergarten schools of the State of 462,175, and in the secondary schools, 34,752. The total enrollment of white school pupils in the State in 1925-26 was 382,172; and of the colored pupils, 114,755. The permanent school fund of the State in 1925-26 yielded \$65,725 in income. The total expenditures for public day schools, 1925-26, were: current, \$10,536,475; outlays, \$3,429,391. The percentage of illiteracy in the State decreased from 15.1 in 1910 to 11.5 in 1920, the percentage among those of native white parentage decreasing from 8.5 to 5.7, and among the Negroes, from 32 to 26.5. An equalizing fund was provided by Act of 1927 authorizing payments to school districts that, applying the 18-mill tax, were yet unable to meet minimum school standards.

**Finance.** State expenditures in the year ending June 30, 1927, as reported by the U. S. Department of Commerce, were: for maintenance and operation of departments, \$13,192,622 (of which \$4,011,789 was for local education); for interest on debt, \$157,667; for permanent improvements, \$7,343,863; total, \$20,694,152 (of which \$9,060,701 was for highways, \$2,679,431 being for maintenance and \$6,381,720 for construction). Revenues were \$20,311,611. Property and special taxes supplied 39.3 per cent; sales of licenses and gasoline tax, 43.1 per cent; earnings of departments and remuneration for officials' services, 4.8 per cent. Property valua-

tion was \$614,383,153; State taxation thereon, \$5,345,133. Net State funded debt, June 30, 1927, was \$3,017,087.

**Political and Other Events.** The State has remained consistently Democratic. In 1914 Governor Hays was reelected. On Jan. 1, 1916, State-wide prohibition went into effect as a result of laws passed by the Legislature of 1915. Senator Clarke died Oct. 1, 1916, and W. F. Kirby was chosen as his successor. In 1916 Charles H. Brough was elected governor; for President, Woodrow Wilson received 112,282 votes and Charles E. Hughes, 47,135. A primary election law was adopted. A constitutional convention in 1918 submitted a new constitution to the people, who defeated it. Governor Brough was reelected in 1918 and J. T. Robinson was elected to the United States Senate. Camp Pike was established near Little Rock during the World War. In October, 1919, five white men and a larger number of Negroes were killed in Phillips County, in collisions between armed whites and Negroes. Five hundred United States troops were sent to the scene of the disorder from Camp Pike. As a result of these disturbances, 86 Negroes were convicted on various charges and 12 condemned to death. In 1920, Thomas C. McRae was elected governor and Thaddeus H. Caraway was elected United States Senator. For President, Cox received 105,618 votes; Harding, 69,874. Constitutional amendments providing for changes in the initiative and referendum, equal suffrage, and an increase in the membership of the Supreme Court received a favorable vote; but as a majority of the total vote cast for governor was required, and they failed to receive this, the amendments failed of adoption. In 1922 Governor McRae was reelected; a proposed amendment to the constitution, providing for a new initiative and referendum law, and other amendments relating to taxation and revenue were defeated. In 1923 strikes on the Missouri & North Arkansas Railroad were ended in December as a result of an agreement reached by the parties and the Governor. In January, 1923, serious rioting occurred in Harrison. On May 14, 1923, flood and fire at Hot Springs did damage amounting to over \$20,000,000. The State's vote for President in 1924 was: Davis, 84,793; Coolidge, 40,036; LaFollette, 13,159. Tom J. Terrall, Democrat, was elected governor by 100,606 over 25,154 for Gabriel, the Republican candidate. John E. Martineau was elected governor, on the Democratic ticket, in 1926. In the Mississippi Valley floods of 1927, over 4,000,000 acres within the State were inundated. For President in 1928, Smith received 119,196 votes; Hoover, 77,751; Harvey Parnell, Democrat, was elected governor.

**Legislation.** The Legislature of 1915 passed a State-wide prohibition bill. In 1917 several amendments were passed in the Legislature, but, as noted above, they failed of adoption. At extra sessions in 1919, measures were passed to create special road-improvement districts. In 1921 the Legislature abolished the corporation commission and the paid penitentiary commission, substituting therefor the Arkansas Railroad Commission and an honorary penitentiary commission. A resolution was adopted for an amendment to permit the taxation of personal property by improvement districts, but it was defeated at the polls. The Legislature of 1923 passed measures for the protection of oil and gas lands, provided for instruction in patriotism in

the public schools, and passed a uniform stock transfer act. A State highway programme was enacted in 1927, involving State measures for payment of road-improvement district debts, through the proceeds of automobile and gasoline taxes; and State construction of highways through issue of \$52,000,000 of State debt in four years, by the agency of a State note board.

**ARKANSAS, UNIVERSITY OF.** A coeducational State institution founded in 1871, at Fayetteville, Arkansas, and comprising colleges of arts and sciences, education, engineering, and agriculture (including the experiment station); a graduate school; and schools of law and business administration; while the medical school is located at Little Rock. The enrollment increased from 665 in 1913 to approximately 1900 in the autumn of 1928, and summer school enrollment grew from 789 in 1923 to 850 in 1928. The number of faculty members was increased from 80 to 196 (in 1928-29), including administrative officers. There were approximately 90,000 volumes in the library in 1928, in comparison with 45,000 at the end of 1923; the productive funds of the University amounted to \$132,000 in 1928; and the income for the year 1928-29, to \$1,200,000. Among the departments added between 1914 and 1928 were those of economics, philosophy, journalism, secondary education, school administration, public speaking, agriculture, architecture, and a graduate school (in 1927) with a dean in charge, and an engineering experiment station. The tax levied for the support of the University was somewhat more than doubled, to \$.001; the State Legislature in 1925 appropriated \$650,000 for new buildings; and later adopted a comprehensive building programme to be carried out by 1933, under which two new buildings for the colleges of engineering and agriculture, respectively, costing more than \$700,000 with equipment, and comprising the first units to be added under the new programme, were completed for occupancy in 1927. President, John Clinton Futrall, LL.D.

**ARLEN, MICHAEL** (1895- ). Pseudonym of Dikran Kouyoumdjian, a British-Armenian novelist. He was born along the shore of the Danube, but his parents moved to England when he was young. He went to school and a university there, and then visited Switzerland. On his return to England, he broke with his parents and began to write popular fiction about the fashionable set with which he associated. His stories and novels were *The London Venture* (1920), *The Romantic Lady*, *Piracy*, *These Charming People* (1924), *The Green Hat* (1924), his most successful novel, which was dramatized the following year; *May Fair* (1925), and *Lily Christine* (1928).

**ARLISS, ARTHUR, GEORGE** (1868- ). An English-American actor born in London, England, where he was educated. He made his first appearance on the English stage at the Elephant and Castle Theatre, London, in 1887, and subsequently toured in America with Mrs. Patrick Campbell's company. Some of his best performances have been in *The Darling of the Gods* (1902), *The Devil* (1908), *Disraeli* (1911), *Paganini* (1916), *Hamilton* (1917), *The Green Goddess* (1921-23), and *Old English* (1924-27). He also has played leading rôles in several successful screen productions and is the author of *Widow's Weeds*, *There and Back*, *The West End*, *The Wild Rabbit*, *What Shall It Profit?* (with

Brander Matthews), and *Hamilton* (with Mary P. Hamilton; 1917). In 1927 he published an autobiography, *Up the Years from Bloomsbury*.

**ARMAMENTS, LIMITATION OF.** See WASHINGTON CONFERENCE. For effect on naval design and shipbuilding, see VESSEL, NAVAL; NAVIES.

**ARME'NIA.** Armenia, as the term was generally employed before the War, did not designate a sovereign state. There was no Armenian state in modern times until the Armenian Republic of Erivan arose in 1918. What the name did signify was portions of Turkey, Russia, and Persia inhabited by Armenians. In the six Armenian vilayets of Turkey, i.e., Erzerum, Van, Bitlis, Diarbekr, Mamut-el-Aziz, and Sivas, lived approximately 1,000,000 Armenians, scattered among more than 3,000,000 Kurds, Turks, and other races, chiefly Moslems. Cilicia, styled Lesser Armenia by Nationalists, also was claimed by virtue of historical tradition and a large Armenian population. Russian Transcaucasia, chiefly the provinces of Erivan, Elisavetpol, and Tiflis, included something over 1,000,000 Armenians, mingled with other races. In addition, perhaps 150,000 Armenians dwelt in northwestern Persia, wherefore the Persian province of Azerbaijan was often included in Nationalist dreams of a greater Armenia. After the outbreak of the War, the Young Turk government charged the Armenians with pro-Ally sympathy and revolutionary purposes and, on this pretext, the Turks began a brutal and systematic campaign of extirpation and banishment. Massacres took place in the centres where groups of Armenians were to be found, in Bitlis, Sivas, Kharput, and Trebizond. Deported to Syria, Arabia, and Mesopotamia, and gathered in huge concentration camps, they suffered all the privations of hunger and lack of shelter, and they died in great numbers. From 1,000,000 to 1,200,000 were deported, and of these at least half met death by actual murder or as a result of neglect.

The Russian advance into Asia Minor in 1915-16 and the fall of Erzerum served to distract the Turks and was the means of saving many Armenians. But the collapse of Russia in 1917 and the Treaty of Brest-Litovsk in 1918 placed the Armenians at the mercy of the Turks once more. The Armenians in Transcaucasia tried to halt the ruin that awaited them by creating the Republic of Erivan, but the Turks swept into Transcaucasia in the spring of 1918, and only the Armistice in the autumn saved the remnants of the Armenians from complete obliteration. The Peace Conference seemed favorable to Armenian hopes. An Armenian delegation, composed of Russian and Turkish Armenians, laid their people's aspirations before the Supreme Council. The creation of an independent Armenia in the midst of Turkish territory, no matter how just, was beset by many difficulties, and attempts were made to induce the United States to accept a mandate over it. The refusal of the American people to involve themselves in Eastern politics and intrigue delayed the settlement of the Armenian question until the completion of the Treaty of Sèvres. By this instrument, a greater Armenia in Russia and Turkey was provided for in 1920 and President Wilson was chosen to map out the confines of the territory in Turkey. President Wilson made public his decision in March, 1921, three months after Erivan had fallen before Turkish and Russian



invaders. By the Wilson line, Armenia was given some 30,000 square miles in the Turkish vilayets of Trebizond, Erzerum, Bitlis, and Van, a coast-line of 150 miles on the Black Sea, and the port of Trebizond. It was a fair enough award, but unfortunately, it was conditioned on the capability of the Armenians to take possession. Their inability to do this, the appearance of the Turkish Nationalist government at Angora, the alliance between Bolshevik Russia and Nationalist Turkey, the helplessness of the European powers who dared not embark on a new war, rendered nugatory the Treaty of Sévres and wrecked all hopes for an independent Armenia. Meanwhile the entry into Erivan of the Bolsheviks and the creation of a Soviet Republic, Dec. 2, 1920, heightened the indifference of the Allies.

Almost the last hope of the Armenians fell with the evacuation of Cilicia by the French in 1921. (See *CILICIA*). In 1919-20 about 500,000 Armenians, placing their faith in French aid, had pushed into Cilicia and put themselves under the protection of French arms. But the Turkish Nationalists turned on the French in force, invaded Cilicia, and took their usual vengeance on the Armenians. It is estimated that 25,000 of them perished here in 1920. The Franco-Turkish Treaty of Oct. 20, 1921, provided for the departure of the French forces, abandoning the Armenians. Finally in 1923 the last chapter was written. By the Treaty of Lausanne, a perplexed and war-weary Europe sought relief through the restoration of the status quo, and Turkey in Asia Minor was left intact. The roseate promise of an independent Armenian State was now definitely ended and the Armenians were again Russian, Turkish, and Persian subjects.

**SOCIALIST SOVIET REPUBLIC OF ARMENIA.** Since 1918 a state belonging to the Transcaucasian Federation and affiliated with the Union of Socialist and Soviet republics. The republic, made up of the former Russian government of Erivan, is, like Georgia and Azerbaijan, situated on the Transcaucasian peninsula and has an estimated area of 11,880 square miles and a population in 1926 of 867,671, as against 1,184,600 in 1914. Eighty per cent of the population is rural. The population is largely Armenian and Christian, about 60 per cent, while minorities of Turco-Tartars, Russians, Greeks, Kurds, and Georgians are also to be found. Erivan, the capital, has a population of about 62,000; Alexandropol, 50,000. A university, with but one faculty, however, was opened at Erivan in 1920.

**Industry and Trade.** Agriculture engages the great proportion of the population, wheat, rice, licorice root, tobacco, and wine being the leading products. Prior to the War, Armenia produced up to 150,000 bales of ginned cotton annually. Cotton growing decayed completely after the Bolshevik Revolution but is gradually reviving. In 1926 the production of raw cotton was 862,890 poods. Mining made up the most important economic activity before the War, for here were found copper ore, rock salt, and iron pyrite deposits. In fact, before the War, the Government of Erivan produced 20 per cent of Russia's whole copper output. From 18,000 to 20,000 tons of salt were extracted annually, 6500 tons of copper, and 50,000 tons of iron pyrites. Three-quarters of the mines, however, had no access to railroads. Actually, having no seafront,

the country was almost wholly cut off from contact with the outside world, and being compelled to depend for its communications on the single Transcaucasian railway that passed through its territory on the way from Batum to Baku. The country has great industrial possibilities for it was estimated that 9,000,000 horse power could be utilized from the water courses.

**History.** The destinies of Armenians were, after all, to be cast in with the lot of Russia and not the West or the United States. Five days after the collapse of the Russian Empire, on Sept. 20, 1917, Armenia, with Georgia and Azerbaijan, established the Federal Republic of Transcaucasia. The career of this federation was stormy; the sympathies of its members indicated marked dissimilarities; and a break, hastened by the Turkish invasion of Transcaucasia in the spring of 1918, came on May 26-28, 1918. War-torn Erivan was evacuated by the Turks late in 1918; a brief respite followed; and then hostilities were renewed, this time with Georgia, in January, 1919. Meanwhile, without the formality of a popular election, a government keenly Nationalistic in tone had been created at Erivan in the Russian Armenian provinces, by the Dashnakzagan party (moderate or Menshevist Socialist), and the country was organized not for reconstruction and peace, but for expansion and war. The Turks and the Kurds were the enemies. Encouraged by the fair promises of the Allied statesmen to believe that Armenia, like Poland, was to be regenerated, Armenians fell easy prey to the war temper. In July, 1919, a high commissioner was despatched to Armenia, and credits were extended to the Dashnakzagan government; in August, Major General J. G. Harbord, U. S. A., appeared to ascertain the possibilities of an American mandate over the country; on Apr. 23, 1920, the Government was formally recognized by the United States; three days later, the San Remo Conference called on President Wilson to delimit the boundaries of a free and greater Armenia. No power, however, seemed willing to assume a mandate over Armenia or to give the struggling Republic of Erivan the aid of which it stood sorely in need; British troops, having temporarily occupied the region in the winter of 1917-18, had been withdrawn in the following summer, to be replaced by Allied troops after the Armistice, which in turn had been evacuated in 1920. The United States Senate, unwilling to follow President Wilson's generous impulse, refused to consider a United States mandate. Britain and France were equally reluctant. Although alternative plans, such as protection by the League of Nations, were discussed, Armenia was left to its own slender resources and extravagant pretensions. Somewhat unreal, therefore, were the paper promises contained in the Treaty of Sévres of Aug. 10, 1920, whereby, out of the major portions of the Turkish vilayets of Van, Bitlis, Erzerum, and Trebizond, a republic was to be erected, and the final act, the drawing of the frontiers on the West, was delegated to President Wilson. It was merely necessary for Armenians to take possession, without aid from the Allies, it is true, but with their good wishes. A general mobilization was ordered, 34,000 men were collected, and a move was commenced on the Turkish provinces by bands of unskilled, undernourished men. To defeat them was a surprisingly easy task. Kars fell without a



struggle, Oct. 31, 1920; a week later, Alexandropol was entered. By Nov. 7, 1920, when a Turco-Armenian armistice was signed, not only were Armenians in flight from the Turkish provinces, but they saw Erivan wholly occupied by the Nationalist Turks. The conduct of the latter was typical: for the six months the country remained in their possession, 140 towns were destroyed, 400,000 people were rendered homeless, the countryside was stripped of every plow, horse, ox, and milch cow. It was Russia, and not the United States or Great Britain, that was able to save something of the Armenian hopes. Meanwhile, the Russian Bolsheviks, now acting more or less in concert with the Turks, had massed 10,000 Red troopers at Akstafa on the Northwest frontier, invaded the country, and coöperated with Armenian Bolsheviks in setting up a Soviet Republic. The new Government at once signed a provisional treaty at Alexandropol on Dec. 2 with the Turkish Nationalist commander, Kiazym Kara Bekir Pasha. This treaty handed over to Turkey the districts of Kars and Ardahan and renounced all claim to Turkish Armenia. This disaster was confirmed by the Russo-Turkish Treaty of Moscow in March, 1921, and by the treaty arranged at Kars the following October between Turkey and the Transcaucasian republics. The temporary restoration of the districts of Karabagh, Zangeoor, and Nakhitchewan to Armenia was but an ephemeral and inadequate consolation.

A final effort of the Dashnakzagan Party to regain power was unsuccessful. On Feb. 18, 1921, through a *coup d'état*, Erivan was seized, but by April 2, the party was in flight, and the Soviet reestablished. On April 21, the Turks evacuated what remained of the Republic; on October 13, in the above mentioned Treaty of Kars, Armenia was recognized by Turkey. Russian aid was profuse but, in the face of the great suffering, ineffective. In 1921, as a result of the evacuation of Cilicia (q.v.) by the French, it was reported that Erivan was filled with 400,000 Turkish Armenian refugees. Russia sent clothing, agricultural implements, 1,500,000 gold rubles for the purchase of grains and animals from Persia, medicines, and nurses; yet in 1922 alone the death toll in Erivan was 150,000 from starvation and cholera. There was, during 1922-24, an application to local problems purely, for under the Soviet leaders the hope of the greater Armenia had been forsaken: the Armenian national home was in Erivan, Kars, and Ardahan; the Armenian vilayets of the former Ottoman Empire had definitely reverted to Turkey, and Turkish possession of them was tacitly recognized by the Allies when they signed the Treaty of Lausanne with Turkey in 1923, from which the Sèvres clauses on Armenia were quietly omitted. Nor was the tiny Republic of Erivan itself really independent. From the Red invasion, it had been overshadowed by the power of Moscow, and at the end of 1921 it had been reintegrated in a Federal Transcaucasian Republic which entered into the Alliance of Socialist Soviet Republics, dominated by Moscow, by the treaty of Dec. 30, 1922.

Under the Soviet regime, Armenia settled down to her task of economic recovery and the building up of a nation to which the hundreds of thousands of Armenians scattered over the world could look back as a homeland. Progress was marked. A well-developed irrigation system was

constructed and by 1925 the total area sown, 255,900 dessiatines, equalled the pre-war area under cultivation. Cotton and tobacco raising made steady advances year by year, and the mining of copper became a leading industry. At Erivan, the capital, a large textile factory, a national theatre, and a national university testified to the revival of industrial and cultural life. In October, 1926, this pleasing aspect of national life was temporarily darkened by a disaster of major proportions, when a series of severe earthquake shocks visited the country. A large part of the city of Leninakan (formerly Alexandropol) was destroyed, many hundreds of people were killed, and thousands of homes were razed.

The problem of settling great numbers of Armenian refugees living precariously in various parts of the Near East outside the borders of the Armenian State engaged leisurely the attention of the League of Nations for several years, which finally, in 1925, sent a commission headed by Dr. Fridtjof Nansen to Armenia to see what could be done. The commission formulated a plan for irrigating two large tracts near Erivan which would provide a home for 15,000 refugees, and proposed an international loan of \$5,000,000 to be raised under the auspices of the League of Nations for this purpose. Although committees of the League approved the plan at different times, its lukewarm reception in some quarters, presumably because of political considerations, stood in the way of its execution. In September, 1928, it was reported that the British government, for reasons of economy, would not join with other governments of Europe which had agreed to help finance the plan. See RUSSIA; WAR IN EUROPE.

#### ARMIES AND ARMY ORGANIZATION.

Military organization comprises the correct and systematic arrangement of the man power and economic resources of a nation to provide that unity of effort essential to success in war. It is employed to carry out the military policy of a nation, which is formulated for the protection and promotion of its national policies. Military organization is divided into the organization of land forces whose mission it is to carry out in the field the military policy of the nation, and the organization of noncombatants and of industries to provide equipment, munitions, and supplies to enable the land forces to fulfill their mission. Previous to the World War, the major European powers and Japan in the Far East had carried military organization to a high degree of development, while the United States, with no definite military policy, was in a period of transition.

During the first three years of the World War, the increase in fire power due to improvement in rifles and machine guns, the increased mobility and rate of fire of heavy artillery, the development of airplanes not only for observation and reconnaissance but for bombing and combat, the introduction of grenades, light mortars, and tanks, and the utilization of gas and other chemical agencies, gave rise to the formation of small units to take advantage of these additional tactical opportunities, but resulted in no radical reorganization either by the Central Powers or the Allies. In the United States, during this period, trouble with Mexico caused the mobilization of a large part of the Regular Army and the National Guard on the Mexican border and the organization of an expeditionary

force which conducted a campaign in Mexican territory. There resulted a grouping of units which made possible some training and experience in the manœuvring and supply of larger units, and although little or no definite preparation was made for the possible contingency of entry into the War, the foundation was laid for the expansion which became necessary after that contingency materialized.

The establishment of Military Training Camps, first for college students and then for business men, in 1915 and 1916, resulted in the partial training of many citizens who formed the nucleus of the body of officers required when the emergency arrived. When the United States entered the War, it became apparent that the forces to be raised should be organized and equipped to utilize to the fullest extent the newly developed weapons and should conform as far as practicable to the organization of the Allies' forces, in conjunction with which the troops would operate. The available forces at the outbreak of the War were the Regular Army and the National Guard, but the prompt enactment of the Selective Service Act provided means for expanding these forces to war strength beyond the natural expansion by enlistment and for the creation of new units to the full extent available of the man power of the nation.

The armed forces of the United States were, therefore, organized primarily into three components: first, the Regular Army; secondly, the National Guard; and thirdly, the National Army, combined as the United States Army in August, 1918. The last named was provided with officers in the higher commands from the Regular Army and in the lower grades from the officers' reserve corps and from graduates of officers' training camps which were immediately established. All these forces were organized under new tables of organization prepared after a study of the organization of the Allied armies; the basic unit was a division of some 28,000 officers and men. The division was made up of a division headquarters, two infantry brigades, a field artillery brigade, a division machine gun battalion, a field signal battalion, an engineer regiment, and divisional trains. An infantry brigade was composed of a headquarters, two infantry regiments, and one machine gun battalion. The artillery brigade was composed of a headquarters, two 75-millimeter gun regiments, one 155-millimeter howitzer regiment, and a trench mortar battery. An infantry regiment was composed of a headquarters and three battalions with four rifle companies of 250 men, a supply company, and a machine gun company, each. An artillery regiment comprised a headquarters and two battalions of three four-gun batteries, a headquarters company and a supply company, each. An engineer regiment was composed of a headquarters and two battalions with three companies of 250 men each. The divisional trains comprised a headquarters and military police company, an ammunition train, a supply train, an engineer train, usually attached to the engineer regiment, a sanitary train, and a mobile ordnance repair shop, attached to the ammunition train.

The road space occupied by a division was 30¼ miles with foot troops marching in columns of squads.

General headquarters, reserve, army, and corps troops comprising heavy artillery units,

engineer units of various kinds, pioneer infantry, and service units, were organized and assigned as required and as they were available. Engineer, quartermaster, signal, and various other special units were organized for service in the base and intermediate zones and along the lines of communication.

The divisions so organized proved unwieldy and lacked mobility, their transportation was complicated, their entry into, and withdrawal from, battle was difficult, development was retarded, and the smaller units could not be adequately supervised by the division commander and his staff. They had great striking and penetration power and under the conditions on the Allied front they proved very effective.

In 1920 the National Defense Act of 1916 was thoroughly revised in the light of war experience, and a definite military policy for national defense was adopted; provision being made for the maintenance of a small and highly trained peace establishment consisting of the Regular Army, the National Guard, and the Organized Reserves, all so organized and trained as to be readily expanded to war strength in emergency. Provision was further made for voluntary military training of citizens through reserve officers' training corps established at various high schools, colleges, and universities, and by means of annual civilian military training camps.

The Regular Army of the United States constitutes a permanent military force. Its peacetime strength was limited by Congress in 1924 to 12,000 officers and 125,000 enlisted men. The National Guard is, first, the organized militia of the State to which it belongs, and secondly, a component of the Army of the United States in time of war. The National Guard is so organized and trained under supervision of the Federal authorities that when mobilized in time of war it will constitute with the Regular Army the first line of defense. The Organized Reserves, comprising the officers' reserve corps and the enlisted reserve corps, composed of citizens who voluntarily accept commissions or enlistments, are grouped into skeleton organizations for rapid expansion in time of war. In time of peace, the Regular Army, the National Guard, and the Organized Reserves are organized, so far as practicable, into brigades and divisions, and for purposes of administration, training, and tactical control, the continental area of the United States in 1924 was divided on a basis of military population into nine corps areas. The Regular Army, owing to its limited strength, is assigned to the corps areas according to military necessities; the National Guard and the Organized Reserves are distributed so that each corps area contains two divisions of the National Guard and three divisions of Organized Reserves and also various corps and army troops.

In a major emergency, the complete mobilization would provide land forces consisting of six field armies with a total of 2,000,000 men, each corps area furnishing one Regular Army division, two National Guard divisions, and three Organized Reserve divisions and corps and army troops according to their varying military population, skeletonized units being brought to war strength by enlistment and the operation of selective service. In a major emergency, mobilization would be effected progressively, the Regular Army and the National Guard being first mobilized and moved to the theatre of operations, followed by the mobilization of the Reserves, including the

necessary troops for lines of communication and the zone of the interior.

The amended National Defense Act of 1920 further provided for the organization of a General Staff in the War Department, modeled after the General Staff which operated in France with the American Expeditionary Forces during the War. It consists of the Chief of Staff, the Deputy Chief of Staff, and four staff divisions dealing with personnel, intelligence, operations and training, and supply; these divisions are designated, respectively, G-1, G-2, G-3, and G-4. The duties of the General Staff, as defined in the Act, are to prepare plans for national defense and the use of the military forces for that purpose, and for the mobilization of the manhood of the nation and its material resources in emergency, to investigate and report on all questions affecting the efficiency of the Army of the United States and its state of preparation for military operations, and to render professional aid and assistance to the Secretary of War and the Chief of Staff. To carry out one phase of these duties, a war-plans division has been constituted to study and develop plans for defense; this is so organized that, in case of a major emergency, it could take the field as the staff of general headquarters in the theatre of operations. In time of peace, command and administration are carried out through the nine corps areas; no commanders are appointed or staffs organized for units greater than a division.

Subsequent to the adoption of the amended National Defense Act of 1920, a board of officers was assembled who defined a general plan of organization for the Army of the United States as provided for in the Act. The strategical and tactical organization of the military forces, it was recognized, might include a general headquarters, groups of armies, corps or divisions, depending on the theatre of operation, the general strategical situation, and the size of the forces engaged. Under the plans outlined by the special board of officers, tables of organization were prepared by the General Staff and put into operation. Tables were prepared for such general headquarters reserve, army, and corps troops as might be required in a major emergency, and which should be included in the Organized Reserves. A typical organization of an army in 1929 comprises an army headquarters and army special troops; two or more corps temporarily assigned; two cavalry divisions; heavy artillery from the general headquarters reserve; a brigade of anti-aircraft artillery; an air service consisting of headquarters, an observation group, and an attack wing; and certain special troops of the signal corps, engineer corps, medical corps, and ordnance corps, with the requisite trains. A typical organization of a corps comprises a corps headquarters and corps special troops; two or more divisions temporarily assigned; an artillery brigade of two regiments of 155-millimeter howitzers and a regiment of 155-millimeter guns; and an observation (flash) battalion and an ammunition train, an air service of two observation squadrons and four balloon companies; an anti-aircraft regiment; a medical regiment; an engineer regiment with three auxiliary battalions; and the requisite trains.

In order to meet the objections to the divisions as organized during the War, the new tables of organization provided for a reduction in strength to about 20,000 officers and men. This reduction was secured by transferring the regi-

ment of heavy artillery to the corps, reducing the strength of the companies in the engineer regiment to 100 men, and the strength of a rifle company in an infantry regiment to 200 men, with a corresponding reduction in the number of machine guns, but leaving the percentage of machine guns to rifles the same. This reduction in strength was in line with the changes in European armies based on the experience of the War. A division so organized still occupies a road space with foot troops marching in columns of squads of about 27 miles, and it is probable that further reduction in the strength of a division will be made in the future, without making any reduction in the strength of a battalion.

The retention of the two-brigade, four-regiment organization has to a certain extent sacrificed manœuvring and mobility to striking power, but in view of the modern tactics of organization in depth, the three-unit scheme was not adopted until the battalion was reached in organization. Since it was recognized that the machine gun was purely an infantry weapon, the machine gun battalions of the former organization were abandoned, and machine gun companies were organized in each battalion.

An infantry division as organized in 1929 comprises a division headquarters; special troops; two infantry brigades, each consisting of a headquarters, a headquarters company and two regiments; a field artillery brigade consisting of a headquarters, a headquarters battery, an ammunition train armed with two anti-aircraft machine guns, and two regiments of 75-millimeter guns, horse drawn; a combat engineer regiment; a division aviation; a medical regiment; and a division quartermaster train.

The special troops of an infantry division consist of a headquarters; a headquarters company; a signal company; a light tank company of 24 tanks, 10 armed with 37-millimeter guns and 14 with machine guns; an ordnance company; a service company (Q.M.C.); and a military police company. An infantry regiment consists of a headquarters; a headquarters company; a service company; a howitzer company armed with three 37-millimeter guns and three 3-inch trench mortars; and three battalions, each consisting of a headquarters, a headquarters company, three rifle companies and one machine gun company armed with 12 machine guns. A field artillery regiment (75-millimeter guns) consists of a headquarters; a headquarters battery; a service battery, armed with two anti-aircraft machine guns; and two battalions, each consisting of a headquarters and headquarters battery, a combat train armed with three anti-aircraft machine guns and three batteries of four 75-millimeter guns and two anti-aircraft machine guns each. A combat engineer regiment consists of a headquarters; a headquarters and service company, and two battalions of three companies each. A division aviation consists of a headquarters; an observation squadron with three anti-aircraft machine guns and 13 airplanes, each armed with two fixed and two flexible machine guns, and a photographic section. A medical regiment consists of a headquarters; a service company; a veterinary company; a collecting battalion of three companies; an ambulance battalion, consisting of a headquarters, one animal-drawn company and two motorized companies; and a hospital battalion of three companies. The division quartermaster train consists of a headquarters; four motor transport companies, each

with two  $\frac{3}{4}$ -ton and 27  $1\frac{1}{2}$ -ton trucks; two motor repair sections; one motorcycle company with 32 motorcycles; and two wagon companies (animal-drawn), each with 66 wagons.

A 155-millimeter howitzer regiment (motorized), frequently attached to an infantry division, consists of a headquarters; a headquarters battery; a service battery; and 3 battalions, each consisting of a headquarters and headquarters battery, a combat train and 2 batteries of four 155-millimeter guns and two anti-aircraft machine guns each.

A cavalry division, as organized in 1929, comprises a headquarters; special troops; two cavalry brigades, each consisting of a headquarters, a headquarters troop, and two cavalry regiments; a field artillery regiment of 75-millimeter guns (horse); an armored-car squadron; a division aviation; a combat engineer battalion (mounted); a medical squadron; and a division quartermaster train.

The special troops of a cavalry division consist of a headquarters; a headquarters troop; a signal troop; a light tank company of 24 tanks, armed as in an infantry division; and an ordnance company. A cavalry regiment consists of a headquarters; a headquarters troop; a machine-gun troop armed with 16 machine guns and 3 one-pounders; and three squadrons each consisting of a headquarters and two troops. A field artillery regiment (horse) in a cavalry division consists of a headquarters and headquarters battery; a service battery; and two battalions, each consisting of a headquarters and headquarters battery, a combat train with three anti-aircraft machine guns and three batteries each of four 75-millimeter guns and two anti-aircraft machine guns. An armored-car squadron consists of a headquarters with 2 cross-country cars; and 3 troops, each with 4 cross-country cars and 12 armored cars each armed with a machine gun and a submachine gun. A cavalry division aviation consists of a headquarters; an observation squadron with three anti-aircraft machine guns and 13 airplanes each armed with 2 fixed and 2 flexible machine guns; and a photographic section. A combat engineer battalion, mounted, consists of a headquarters; a headquarters and service platoon; and three companies. A medical squadron consists of a headquarters; a collecting troop; an ambulance troop with 10 animal-drawn and 10 motor ambulances; a hospital troop; and a veterinary troop. A cavalry division quartermaster train consists of a headquarters; 2 motor transport companies, each with two  $\frac{3}{4}$ -ton and 27  $1\frac{1}{2}$ -ton trucks; 1 motor repair section; 1 wagon company with 66 wagons; and 4 pack trains, each of a bell horse and 50 mules.

Regiments and higher units have attached medical personnel and chaplains. Units smaller than a regiment, operating independently, have attached medical personnel.

See ARTILLERY: STRATEGY AND TACTICS.

**ARMIN, FRIEDRICH SIXT VON** (1851- ). A German general, born at Wetzlar. In 1917 he was appointed chief-in-command of the 4th Army in Flanders which, in 1918, took Armentières and Kemmel Hill. See WORLD WAR, under *Western Front*.

**ARMISTICE, THE.** See WORLD WAR.

**ARMISTICES.** See WAR, DIPLOMACY OF THE.

**ARMORED CRUISER.** See VESSEL, NAVAL.

**ARMORED SHIP.** See VESSEL, NAVAL.

**ARMOUR, J (ONATHAN) OGDEN** (1803-1927). An American capitalist and merchant (see VOL. II). After he had become head of Armour & Co., in succession to his father, Philip D. Armour, in 1901, the sales grew approximately from \$250,000,000 in 1910 to \$1,038,000,000 in 1919, with a total net income ranging from \$9,808,305 to \$27,180,124. A suit was impending in 1920 for alleged violation of the Sherman Anti-Trust Law, but an agreement was reached with the United States Government whereby Armour & Co., as well as several other big packers, should restrict their business to meat packing alone. The Armour interests suffered in the economic depression that followed the World War, and in the year 1923 Armour & Co. was reorganized, Mr. Armour losing control but retaining the chairmanship of the board of directors. After 1926 the firm ceased to be a family affair, and in April, the Armour Grain Corporation, which had been organized by the elder Armour in 1890, was liquidated. Mr. Armour developed at Lake Forest, Ill., a model farm which was valued at \$5,000,000, but this enterprise also, of which he was very fond, he was compelled to relinquish. He wrote *The Packers* and *the People* (1906).

**ARMSBY, HENRY PRENTISS** (1853-1921). American agricultural chemist, born at Northbridge, Mass. (see VOL. II). For the 14 years which preceded his death, he was director of the institute of animal nutrition at the Pennsylvania State College. He was a member of the Agricultural Committee of the National Research Council (1917) and a delegate to the Inter-Allied Scientific Food Commission (1918). His later works included *The Nutrition of Farm Animals* (1917) and *Conservation of Food Energy* (1918).

**ARMSTRONG, EDWARD** (1846-1928). An English historian and educator (see VOL. II). He was provost of Queen's College (1911-22) and warden of Bradfield College (1910-25). In 1921 he was lecturer to Oxford University for the Dante sexcentenary and in 1926 he received the Serena Medal of the British Academy.

**ARMSTRONG, EDWARD COOKE** (1871- ). An American educator, born at Winchester, Va. (see VOL. II). After heading the Romance department at Johns Hopkins University for seven years, he became professor of the French language at Princeton in 1917. During the War, he served as national recruiting secretary for the Foyer du Soldat and as national director of French instruction in the training camps (1918). After the armistice, he was dean of American students and lecturer at the University of Bordeaux. In 1925 he became secretary of the American Council of Learned Societies. He is a Chevalier of the French Legion of Honor. He wrote and edited several books on the teaching of French and was co-editor of *Modern Language Notes* (1911-15).

**ARMSTRONG, HELEN MAITLAND** (1869- ). An American artist, born at Florence, Italy. She was the daughter of the United States Consul General in Italy. Her early education was at home; later, she studied at the Art Students' League. Among her works are the windows of All Saints' Chapel, Biltmore, N. C., and windows in the armory of Mrs. O. H. P. Belmont's New York house, the New York Church of the Ascension, and St. Michael's Church, and five in the chapel at Sailors' Snug Harbor, Staten Island.

**ARMY.** See **ARMIES** and **ARMY ORGANIZATION**.

**ARMY INTELLIGENCE TESTS.** See **MENTAL MEASUREMENT**; **RACE PROBLEMS**.

**ARNHEIM, FRITZ** (1866- ). A German historian and traveler, born in Berlin and educated at the universities of Berlin and Halle. In the course of his studies, he made prolonged tours through Sweden, Belgium, and Norway (1900-12), and subsequently lectured on these countries. He became editor of *Mitteilungen an der Historischen Litteratur* (1915) and co-editor of *Schwedische Blätter* (1920). His numerous works on historical subjects, literature, etc., include *Der Hof Friedrichs des Grossen* (1912); *Schweden* (1917); and *Arteilung Skandinavischer Staaten in der Illustrierten Weltgeschichte* (1920).

**ARNOLD, BION JOSEPH** (1861- ). An American electrical engineer, born at Cazenovia, Mich. (see Vol. II). During the years 1914-21, he reviewed plans for a comprehensive system of steam railway terminals for the city of Chicago and advised the officials of Boston, Des Moines, Omaha, and other cities of the United States, and of Winnipeg, Man., in regard to traction matters. He was a member of the Naval Consulting Board during the World War and was called into active service in December, 1917, as a lieutenant colonel in the United States Army Signal Corps, Aviation Section. He made reports on the aluminum situation and supervised the development and production of aerial torpedoes. In 1919 he received a commission as colonel in the air corps, Officers' Reserve Corps, and in 1925 was transferred to the Auxiliary Corps with the same rank.

**ARNOLD, JULEAN (HERBERT)** (1876- ). An American commercial attaché for China. He was born in Sacramento, Calif. and educated in the University of California. In 1902 he was commissioned by President Roosevelt the first student interpreter to China and, from 1904 to 1914, held various consular positions in China and Japan. He was commercial attaché in China and Japan, 1914-17, commercial attaché in Japan, September-November, 1923, and has been commercial attaché in China since 1914. He received various decorations from the Chinese government and the degree of LL.D. from St. John's University, Shanghai, in 1919. He is the author of numerous magazine articles on China, and the compiler of the *Commercial Handbook of China*. In 1918, 1922, and 1926-27 he was chairman of the American delegation to the China Tariff Revision Commission, and has been honorary high advisor of the National Red Cross of China.

**ARNOLD, RALPH** (1875- ). An American geologist, born at Marshalltown, Iowa. He was graduated from Throop Polytechnic Institute in 1896 and from Leland Stanford Junior University in 1899, and pursued his studies at the latter institution until 1902. He was an assistant in geology at Stanford, 1899-1903, and also taught chemistry and physics at Hoitt's School, Menlo Park, Calif., 1899-1900. In 1900 he entered the service of the United States Geologic Survey as a field assistant, and he passed through the subordinate grades until he became geologist, 1908-09. During these years, he acquired an intimate knowledge of the geology and paleontology of the California petroleum fields, and in 1909 he resigned from the Survey to enter

private practice as an oil expert. He has made investigations of the fields of various American States, Trinidad, B. W. I., Venezuela, and other countries. In 1911-12 he was consulting petroleum engineer of the United States Bureau of Mines. He lectured at Harvard University, the University of Chicago, and the Massachusetts Institute of Technology, 1914 and 1915. He was a member of the Excess Profits Tax Board, 1918, valuation expert and chief of the mining, oil, and gas section, 1918-19, and representative of the board at the National Reconstruction Conference of 1918. Dr. Arnold, who received the degree of Sc.D. from the University of Pittsburgh in 1921 and that of D.Eng. from the University of Southern California in 1925, has been an officer or member of many associations of scientists, and has written numerous papers on geology and paleontology. In 1914 he became an associate editor of *Economic Geology*.

**ARNOUX, AR'NOO', ALEXANDRE** (1884- ). A French poet and novelist, born at Digne (Basses), France, who was the author of realistic stories and of a fantastic play. His style was alert, lively, dramatic. His works include *L'Allée des mortes*, poems (1906); *Au grand vent*, poems (1900); *La mort de Pan* drama (1909); *Le roman littéraire IV*, with D. Flaboché (1912); *Abisag ou l'Eglise transportée par la loi* (1918); *La nuit de Saint-Barnabé*, describing Parisian urchins (1920); *La Légende du roi Arthur et des Chevaliers de la Table Ronde*, a translation of Malory (1920); *Indice 33*, awarded the Prix de la Renaissance (1922); *Huon de Bordeaux*, a fairy melodrama (1922); *Suite Variée* (1925); *Le Chiffre* (1926), and *Rencontres avec Richard Wagner* (1927).

**ARRHENIUS, AR-rä'ni-us, SVANTE** (1859-1927). A Swedish chemist (see Vol. II). Among his later books were *Quantitative Laws in Biological Chemistry* (1915), *The Destinies of the Stars* (1918), and *Chemistry and Modern Life* (1919).

**ARSONVAL, ARSENE D'** (1851- ). A French physician, physiologist, and physicist. He was co-discoverer with Hertz, Tesla, and E. Thomson of high-frequency electrical circuits and sole originator of their use in the treatment of disease. Every piece of apparatus for this purpose was separately invented by him, and the application of the method is known as arsonvalization. Born at La Porcherie (Haute-Vienne), he was educated in Limoges and received his medical degree from the University of Paris in 1877. He began his career as assistant in the laboratory of Claude Bernard and in 1882 was made director of the newly created laboratory of biological physics in the École des Hautes Études. In 1889 he collaborated with Brown-Séquard in the pioneer research into the internal secretions. In 1894 he was appointed professor of medicine in the Collège de France. Beginning in 1881 and through the ensuing quarter-century, he published a continuous series of articles on electro-physiology in all of its aspects. His pioneer work on the action of high-frequency circuits on man and animals was done during 1890-95. In 1903, assisted by Chauveau and others, he produced his magistral work *Traité de Physique Biologique*. He became vice president of l'Académie des Sciences in 1916 and its president in 1917.

**ARTHUR, JULIA** (1869- ). An American actress, born at Hamilton, Ont. (see Vol.



II). On her return to the stage in 1914 after an absence of 14 years, Miss Arthur acted in *The Eternal Magdalene* in New York. Other of her appearances were in *Liberty Aflame* (1917), *Out There* (1918), *An Ideal Husband* (1918) and *Macbeth* (1921).

**ARTIFICIAL GEMS.** See MINERALOGY.

**ARTIFICIAL SILK.** See RAYON.

**ARTILLERY.** The dictum of the great Napoleon that artillery has been and always will be the determining factor of armies and peoples was abundantly confirmed by battle experience in the World War. One of the outstanding lessons of the War was the increasing relative importance of artillery in modern warfare. The combatant troops of all the nations engaged in this greatest of all conflicts insistently demanded not only more artillery, but artillery of greater power and increased mobility. With entire populations of nations engaged in the struggle, scientific, engineering, and manufacturing knowledge was focused on the production of more and more powerful weapons to a degree never before experienced. The natural result of this condition of affairs is the great array of more powerful ordnance which owes its existence to the stimulus given inventive genius by the World War.

In addition to greater range and greater mobility, the modern artillerist demands greater rapidity of fire; greater permissible elevation, with a view to possible use against aircraft; all-around fire or the nearest practicable approach to it, in order to avoid constant shifting of the entire gun carriage; increased quickness of going into action and limbering up for quick abandonment of untenable positions; and interchangeability of the gun with its companion howitzer of a slightly larger calibre on combination gun-howitzer mounts in order to simplify supply and maintenance problems in the field. Manifestly, these conflicting requirements involve considerable compromise. The ingenuity of ordnance engineers has therefore been directed toward securing the most desirable combination of characteristics. To arrive at this result, practically all of the war departments of the nations involved in the conflict, as soon as the Armistice afforded proper opportunities, made a special effort to review the artillery situation not only in their own armies but in the armies of all nations involved in the War.

In the United States Army, this desire to benefit by the lessons of the strife after the war ended in 1918, led to the convening of the Board of Officers with instructions to make an exhaustive study of the entire artillery situation, and then to recommend the types and calibres of artillery which should be developed for future armament. Similarly constituted boards of officers representing the Armies of the Allied Powers made extended visits to the United States in the years immediately following the War, admittedly or presumably engaged in similar research. Few of the great nations of the world disclose the details of their ordnance designs, but under the present form of government and existing institutions of the United States, it would be quite impossible to keep secret information of this nature except in time of war. It is probable, however, that the information in regard to recent developments in artillery design published in the United States represents in the main a fair gauge of progress in similar directions in

other countries, inasmuch as ordnance information was freely interchanged among the Allied Powers, and successful attempts were made to secure similar information from the authorities of the Central Powers after the Armistice. The following descriptions of artillery material may, therefore, be taken as typical of the state of the art of ordnance design and manufacture throughout the world.

**Light Field (Division) Artillery.** Prior to the War, weight was the determining factor in the design of division artillery. Motor traction had not arrived at a degree of dependability which would justify its employment in manœuvring artillery over varying terrain. The main reliance was still on animal transport, as it had been for the preceding century. Assuming that a horse could pull 650 pounds at all gaits and that a six-horse team was the maximum number that could be manœuvred effectively, 3900 pounds became the maximum weight for any complete single unit of division artillery. Within this limit, the ordnance engineers of all countries strove to arrive at the best combination of range, striking velocity, and explosive effect on bursts. In the United States Army, a division field gun 3 inches in calibre, firing a projectile weighing 15 pounds, was adopted as standard, and other countries varied only slightly from these figures. In order to achieve greater bursting effect, a heavier projectile carrying a larger explosive charge was needed. Since the degree of mobility of the division gun must be maintained, it was found necessary to design a companion piece, the division howitzer, using a projectile approximately twice as heavy as that of the gun and attaining approximately the same range by providing for greater elevation of the howitzer carriage than provided by the gun carriage, thereby avoiding the increased weight which would have resulted through strengthening the gun to fire the heavier projectile at low angles of elevation.

During the War, motor transport was developed to a high degree of dependability and the maximum permissible weight of divisional artillery units was considerably increased. Accordingly, the Calibre Board of the United States Army laid down these requirements for ideal divisional artillery:

#### REQUIREMENTS OF THE CALIBRE BOARD FOR LIGHT FIELD (DIVISION) ARTILLERY

	Gun	Howitzer
Calibre	About 3 inches	105 millimeter
Weight of projectile	Not over 20	30 to 35 pounds
Maximum range	pounds	
Carriage to permit elevation of	15,000 yards	12,000 yards
Traverse	80°	65°
Weight	360°	360°
Range with normal or reduced charge	Not over 4500 pounds	Not over 4500 pounds
Rate of fire, rounds per minute	11,000 yards	20

Carriage to be interchangeable for gun and howitzer. Perfection of split-trail type recommended. Wheels to have rubber tires when motorized. Development of self-propelled mounts recommended. Simple firing mechanism, preferably of lanyard type, desired. One type of breech block for both gun and howitzer. For normal use, a maximum speed of 12 miles per hour.



Division guns and howitzers which gave the required ranges within the prescribed limits of weight were designed and successfully fired, the increase in range over that of pre-war types having been attained principally by improvements in the contour of the projectile and by increasing muzzle velocities of the pieces. Increased velocities necessitated corresponding increases in length of the piece, for the division gun 131.7 inches in the new design, as compared with 87.8 inches in the pre-war type. Increased length of the piece in turn made it necessary to support it as near the breech as possible in order to avoid the necessity of digging holes in the ground to permit recoil of the gun when fired at high elevation. The consequent unbalancing of the gun requires the addition of an equilibrator system to maintain ease of manual elevation. Fortunately, the increased weight due to the equilibrator system and the increased length of bore is more than offset as far as mobility is concerned by the introduction of dependable motor transport in place of animal transport.

The requirement for a maximum elevation of 80 degrees was due to a desire to provide for possible use against aircraft and also in order to provide a more curved trajectory which would give a steeper angle of fall and thus prove effective against personnel grouped behind earthworks but without overhead cover. The increased elevation obviously added nothing to the maximum range inasmuch as elevation in excess of 45 degrees tends to decrease range rather than to increase it. In order to provide for angles of elevation greater than 45 degrees, it was necessary to increase the capacity and therefore the weight of the equilibrator system,

to provide variable recoil with consequent increased complication and weight of the equilibrator system. While entirely practicable from an engineering and manufacturing standpoint, complication of design necessary to meet requirements which were outside of the ordinary functions of the piece led to a lowering of the maximum required elevation in the ideal mount from 80 degrees to 45 degrees, at which elevation practically maximum range is secured. A traverse of 360 degrees as originally prescribed for the ideal division gun and division howitzer was likewise caused by a desire to provide a piece suitable for use against aircraft, but this requirement was abandoned in favor of two types of carriages, the split-trail, which permits considerable changes in azimuth without moving the gun carriage, and the box-trail, which permits only a change of 10 degrees in the azimuth but reduces complications of design and decreases weight and cost.

The requirement of a carriage to mount interchangeably both the 75-millimeter gun and its companion piece, the 105-millimeter howitzer, was due to the feeling that it would expedite manufacture in the shops and simplify maintenance in the field. Strict adherence to this requirement, however, necessitated a combination carriage much heavier than either a specially designed gun carriage or howitzer carriage alone. Inasmuch as the howitzer mounted on the combination carriage required elevation mechanism of only 65 degrees, it did not fully utilize the weight of that part of the mechanism needed to provide the 15 degrees greater elevation for the gun. Further, as the howitzer imposed upon the carriage greater firing stresses than the gun, the combination car-

#### EXPENDITURE OF ARTILLERY AMMUNITION IN RECENT WARS

##### Previous Wars Compared with One Month of World War

YEAR	WAR	ARMY	ROUNDS EXPENDED DURING WAR
1859	Italian	Austrian	15,326 I
1861-65	Civil	Union	5,000,000
		Prussian	36,199 I
1866	Austro-Prussian	Austrian	96,472 I
1870-71	Franco-Prussian	German	817,000 ■
1904-05	Russo-Japanese	Russian	954,000 ■
1912-13	Balkan	Bulgarian	700,000 ■
1918	World War	Brit. & Fr.	12,710,000

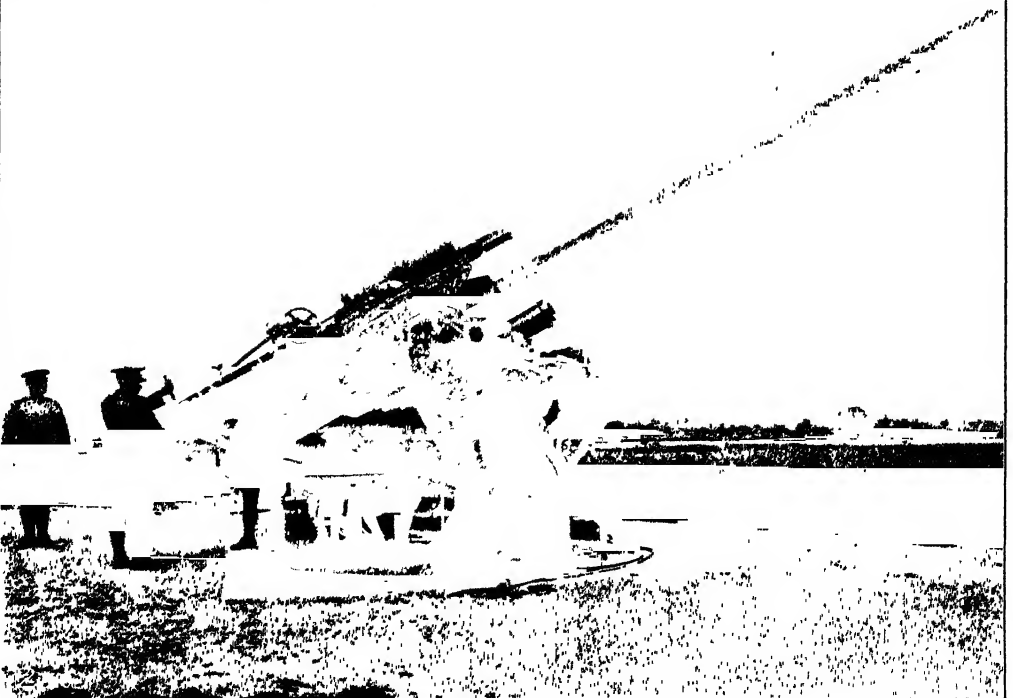
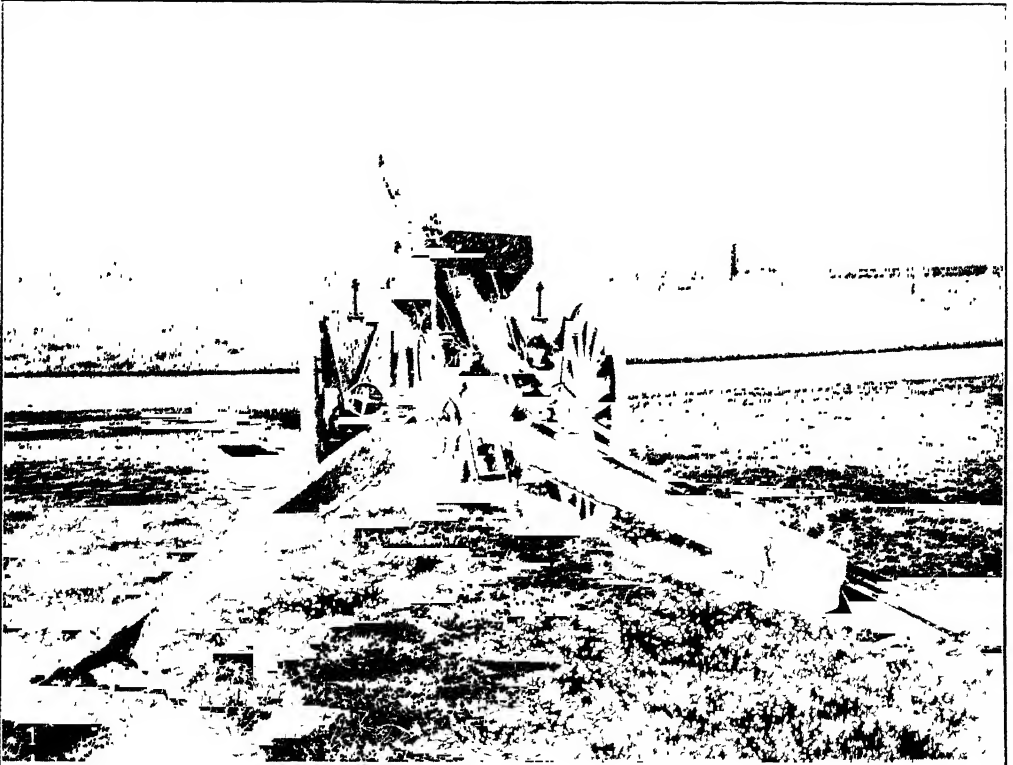
One Month<sup>a</sup> — — —

##### Expenditures for One Year, Civil and World War

YEAR	WAR	ARMY	ROUNDS EXPENDED FOR ONE YEAR
1864 <sup>b</sup>	Civil	Union	1,950,000 ■
1918 <sup>c</sup>	World War	U. S.	8,100,000 ■■
1918 <sup>c</sup>	World War	British	71,445,000
1918 <sup>c</sup>	World War	French	81,070,000

a, Average, year ended Nov. 10, 1918. b, Year ended June 30, 1864. c, Year ended Nov. 10, 1918.

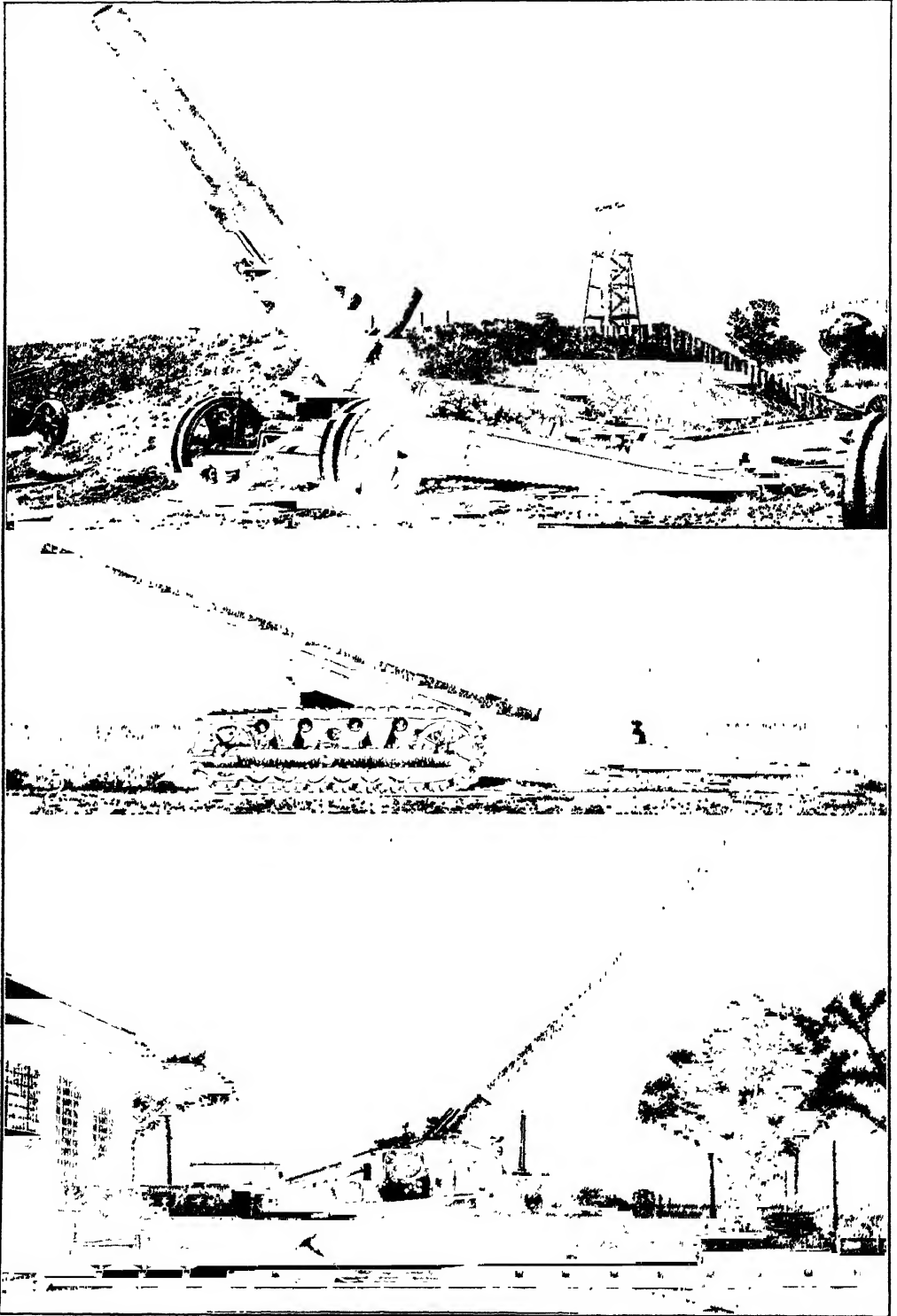
## ARTILLERY



*Photographs Ordnance Department, U. S. Army*

1. U. S. ARMY 75-MM. GUN AND MOUNT, MI, 45 DEGREES ELEVATION AND TRAVERSED TO LEFT.
2. U. S. ARMY 105-MM. ANTI-AIRCRAFT GUN AND MOUNT, MI—RIGHT SIDE.

## ARTILLERY



*Photographs, Ordnance Department, United States Army*

### UNITED STATES ARMY ARTILLERY

1. EIGHT-INCH HOWITZER, M1920M1, Mounted on an 8-Inch Howitzer-155-millimeter Gun Carriage, M1920 E, Elevation, 45 degrees.
2. A 155-MILLIMETER GUN ON TRAILER MOUNT.
3. FOURTEEN-INCH GUN ON RAILWAY MOUNT, M1920.

## EXPENDITURE OF ARTILLERY AMMUNITION IN MODERN BATTLES

YEAR	BATTLE	DAYS' DURATION	ARMY	ROUNDS OF ARTILLERY AMMUNITION EXPENDED
1863	Chickamauga	2	Union	7,325
1863	Gettysburg	3	Union	32,781
1870	St.Privat	1	German	39,000
1904	Nan Shan	1	Japanese	34,047
1904	Liao Yang	9	Russian	134,400 ■
1904	Sha Ho	9	Russian	274,360 ■
1915	Neuve Chapelle	3 <sup>a</sup>	British	197,000 ■
1915	Souchez	1 <sup>b</sup>	French	300,000 ■
1916	Somme	7 <sup>c</sup>	British	4,000,000
1917	Messines Ridge	7 <sup>c</sup>	British	2,753,000
1918	St.Mihiel	4 <sup>b</sup>	U. S.	1,093,217

Artillery preparation lasted: a, 35 minutes. b, 4 hours. c, Intermittent 7 days.

riage was of necessity made stronger and, therefore, heavier than was absolutely needed when mounting a gun. The need for all possible mobility not only en route but while being manned in action was found to outweigh the theoretical advantages which might be obtained by interchangeability of mounting, and it is entirely probable that in the future the division gun and the division howitzer will each have its specially designed carriage in order to keep the weight down to a minimum and thereby effect

the greatest degree of mobility without decreasing power.

The increased application of motor transport to military problems permitted not only the hauling of greater loads at a speed equal to that of animal transport but greatly increased the speed at which these increased loads can be moved. These increased speeds in themselves affected artillery design by necessitating the rubber-tiring of wheels and in many cases spring-supporting of loads, which had never

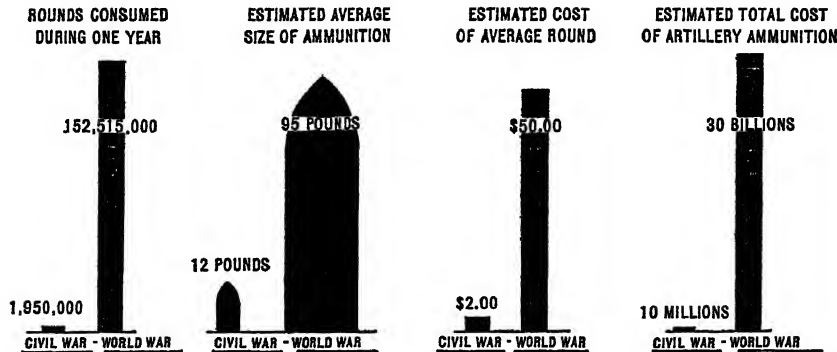
## RATES OF ARTILLERY FIRE PER GUN PER DAY IN RECENT WARS

WAR	ARMY	APPROXIMATE ROUNDS PER GUN PER DAY
1854-56, Crimean	Brit. & Fr.	5* ■
1859, Italian	Austrian	.3
1861-65, Civil	Union	4 ■
	Austrian	2.2 ■
1866, Austro-Prussian	Prussian	.8
1870-71, Franco-Prussian	German	1.1** ■
1904-05, Russo-Japanese	Russian	4 ■
1912-13, Balkan	Bulgarian	7 ■
World War		
September, 1914	French	8** ■
Jan. 1 to Oct. 1, 1918	Italian	8** ■
Jan. 1 to Nov. 11, 1918	United States	30**
Jan. 1 to Nov. 11, 1918	French	34**
Jan. 1 to Nov. 11, 1918	British	35** ■

\* Siege of Sebastopol

\*\* Field gun ammunition only.

## COMPARISON OF ARTILLERY AMMUNITION VALUES CIVIL WAR - WORLD WAR



been found necessary before. Here, as elsewhere, no advantage is obtained without an off-setting disadvantage. The application of rubber tires to artillery wheels increases the total weight of the unit by several hundred pounds.

Great progress also was made in the design and manufacture of self-propelled mounts for division artillery. Requirements of an ideal mount were set by the Calibre Board at a maximum speed of 12 miles per hour and a maximum weight not to exceed the capacity of a light pontoon bridge, or 9000 pounds. It is an interesting commentary on the rapid advances in automotive engineering that within three years of the establishment of this required maximum speed, a self-propelled mount for .75-millimeter guns or 105-millimeter howitzers actually attained a maximum speed of 30 miles per hour or two-and-a-half times what was deemed possible of attainment when the Calibre Board established its requirements.

**Medium Field (Corps) Artillery.** These characteristics for ideal corps artillery pieces were established by the calibre Board:

## MEDIUM FIELD (CORPS) ARTILLERY

	Gun	Howitzer
Calibre	Between 4.7 in. and 5 in.	About 155 mm.
Weight of projectile	Not over 60 lb.	Not over 100 pounds
Maximum range	18,000 yd. su-per-charge	16,000 yd.
Range, normal charge	12,000 yd.	Zones
Elevation	- 5 to + 80 °	5 to + 65 °
Traverse	360 °	360 °
Maximum rate of fire	6 rounds per minute	5 rounds per minute

## Generalities:

A split-trail carriage should be developed for howitzer interchangeable, if practicable, with that for gun.

Maximum speed of 8 miles per hour.

Wheels for carriage should be rubber-tired.

Transport fully motorized, with wheel trailers for long rapid hauls.

Weight limit, 12,000 pounds for wheeled vehicles, and 15,000 pounds for caterpillars.

The objections to unnecessarily high elevation and 360 degrees traverse as well as to the interchangeable requirement for the carriage proper are the same as discussed above for division artillery, but the disparity in stresses imposed upon the mount by the corps gun and corps howitzer is even greater than that of the division gun and the division howitzer. Since the carriage had to be designed to mount the howitzer successfully, it was possible to design a gun of even greater power than was at first held to be ideal and still to adhere to the desired degree of mobility. Accordingly, a gun firing a 50-

pound projectile to a maximum of 20,500 yards has been found practicable. Self-propelled mounts for either the 4.7 gun or the 155-millimeter howitzer with a maximum speed of 15 miles per hour have been designed, manufactured, and successfully tested.

**Heavy Field (Army) Artillery.** Of still larger calibres are the army artillery, where ideal characteristics were formulated as follows:

## HEAVY FIELD (ARMY) ARTILLERY

	Gun	Howitzer
Calibre	About 155 mm.	About 8 inches
Weight of projectile	Not over 100 lb.	Not over 240 lb.
Maximum range	25,000 yd.	18,000 yd.
Range, normal charge	18,000 yd.	Zones
Elevation	Zero to 65 °	Zero to 65 °
Traverse	360 °	360 °
Type of projectiles	H. E. Shell	H. E. Shell

Self-propelled caterpillar unit desirable for 155 mm. gun.

Certain proportion should be retained on rubber-tired wheel mounts.

It is desirable to develop a carriage which can be used interchangeably for 155 mm. gun and 8 in. howitzer.

Maximum speed of S. P. caterpillar 6 m.p.h.; wheel mounts, 12 m.p.h.

Conventional caissons for this calibre are obsolete.

Transport: All of this type should be motorized. Ammunition vehicles to correspond should be developed.

Requirements of heavy field artillery as given above can be met except in regard to traverse of 360 degrees for the reasons previously discussed under division and corps artillery. Unlike the preceding classes, however, it is entirely practicable to design a carriage on which the 155-millimeter gun and 8-inch howitzer can be mounted interchangeably.

## REQUIREMENTS FOR SUPER-GUNS

	Guns		Howitzers	
Calibre	8 or 10 in.	14 in.	12 in.	16 in.
Length in calibres	50	50	20	25
Weight of projectile	240-510	1,400	700	1,600
Maximum range	35,000	40,000	25,000	30,000
Elevation	0 ° to 50 °	0 ° to 50 °	25 ° to 60 °	25 ° to 65 °
Traverse	360 °	360 °	360 °	360 °
Type of projectile	H. E.	H. E.	H. E.	H. E.
Time for occupying position—				
Prepared		1 hour		
Unprepared	1 to 4 hrs.	8 hours	1 hour	
Maximum rate of fire	1 shot, 2 minutes			
Gauge of Track	Stand-ard	Stand-ard	Stand-ard	Stand-ard
Ammunition for all cannon: Smokeless, flashless.				
Related zone charges for howitzers.				
Fuses: Bore safe, instantaneous, and selective delay.				

Of the super-guns listed above, a 14-inch 50-calibre gun on a railroad mount has been designed, manufactured, and successfully tested. The 16-inch 25-calibre howitzer also has been successfully fired from a barbette carriage. This howitzer can be used on the railroad mount for the 14-inch 50-calibre gun.

**Coast Defense Artillery.** The superiority of land fortifications over battleships where land guns have approximately the same range as those on the ships has always been accepted by artillery authorities. The failure of the joint British and French naval attacks on the Turkish coast defenses at the Dardanelles and the lack of success which attended the constant shelling of hastily erected German defenses on the Belgian coast, supplemented by bombing from the air, strengthened the contention that battleships cannot hope to attack with success coast fortifications provided with armament of approximately equal power. However, due to the increased elevation and the correspondingly greater range of guns mounted on battleships built since the War, artillery intended for coast defense purposes must of necessity be provided with carriages permitting elevation to develop the maximum range of the piece. In 1914 the American 14-inch 40-calibre gun mounted on a disappearing carriage and the 12-inch long-range mortar were typical of standard heavy coast defense armament. Through the development of airplane carriers to accompany attacking fleets, and the steeper angle of fall of projectiles fired at the 30 to 40 degrees elevation which is now required for long-range naval fire and provided in recent designs of battleships, the need for protection formerly given to guns mounted on disappearing carriages by extensive concrete emplacements was materially diminished. This consideration, together with the difficulty encountered in providing the required high angles of elevation on disappearing carriages, resulted in the adoption of the simpler barbette carriage for future installations. The best example of modern high-powered coast defense artillery is probably in the 16-inch 50-calibre gun mounted on a barbette carriage following designs of the United States Army Ordnance Department. This gun is of wire-wound construction, is approximately 70 feet in length over all, and with its recoil band weighs about 200 tons. It is equipped with a drop breech-block of the Smith-Asbury type, operated by compressed air. The normal charge for this gun consists of 850 pounds of smokeless powder, giving a maximum interior pressure of 38,000 pounds per square inch. With this charge, a range of 50,000 yards is given an armor-piercing projectile weighing 2340 pounds and capable of penetrating 14 inches of battleship armor at all ranges. The barbette carriage on which this gun is mounted is simple and rugged in design; yet it has adequate provision for rapid and accurate manœuvring of the gun. The recoil of the gun is controlled by four recoil cylinders symmetrically located and integral with the cradle. The energy generated on discharge of the piece is dissipated by forcing oil through throttling grooves in the wall of each cylinder as the piston rods and heads, securely fastened to the recoil band of the gun, move to the rear with it. The piston rod pull amounts to 1,250,000 pounds for every 40 inches of recoil, so that the recoil cylinders dissipate 4,567,000 foot-pounds of energy each time the gun is fired. To insure the rate of fire of one round per minute, a power

rammer is located on the racer near the breech of the gun. The powder charge and projectile are brought up to the carriage on special cars and rammed home by means of an electric motor actuating the rammer through hydraulic speed gears. The carriage is equipped so that all operations are normally performed by electricity or compressed air, but the mechanisms are so arranged as to permit manœuvring by hand power in emergencies.

**German Long-range Guns.** All military weapons are appraised, in general, on the basis of the amount of destruction they can cause. If the performance of the German long-range guns used for the bombardment of Paris from Mar. 23 to Aug. 9, 1918, are judged on the usual basis, they must be set down as failures. The casualties caused by them average only about two and a half per round, notwithstanding that a thickly populated city was being bombarded. The property damage per round fired was approximately that of an ordinary 6-inch shell and in the aggregate was of negligible military value. However, these guns were not primarily weapons of destruction but were rather psychological weapons, for their purpose was served when the German High Command was able to say without fear of contradiction that their troops were bombarding Paris by artillery fire. At first, no mention was made in their communiqués that super-guns of much greater range than had ever before been even proposed for use in battle were responsible for the artillery bombardment.

The known fact that Paris was under fire of German artillery served two purposes. First, it greatly heartened the German civilian population as well as troops in the field with the knowledge that the ultimate goal had practically been reached. Secondly, it caused consternation among the civilian population of the Allies, who could not at first believe but that the Germans had succeeded in arriving at the gates of Paris. Before it was learned that the shells were coming from guns situated more than 75 miles from the city, a considerable exodus of Parisians to the South and West of France threw such a load on the railroad systems that a serious interference with the movement of supplies and troops was narrowly averted, but when the French technical experts had succeeded in reconstructing the projectile from fragments found at the point of burst and had deduced from their angle of fall the exterior ballistic characteristics which must have been used to produce the observed results, the situation was immediately relieved.

Although over 300 shells fell in the environs of Paris, none of them was known to have failed to explode. Exact information in regard to the ammunition remained unavailable. The guns themselves were withdrawn into Germany and broken up prior to the Armistice. Although the terms of this undertaking provided for delivering one of these pieces to the Allies, Germany never fulfilled the agreement, and exact information as to the design of the gun and carriage still remains in the sole possession of the small group of Germans who conceived and successfully carried out this spectacular performance. As an artillery curiosity, this type of gun attained a range never before considered possible and also demonstrated that greater range could be attained at an angle of 50 degrees than the previously accepted 42 or 43 degrees, provided that extremely high muzzle velocity was used and



the projectile attained extremely high altitudes early enough in its flight to get full benefit from the more highly rarefied strata of air, instead of attempting to force the projectile against denser strata of air encountered at lower altitudes.

The following table gives the characteristics of the German long-range gun, as computed by Maj. J. Maitland Addison of the British Army, and in a parallel column, the reconstructed characteristics as determined by the French General Staff.

	British	French
1. Range in miles	76	76
2. Maximum height in miles	23.9	23.7
3. Time of flight in seconds	177	177
4. Muzzle velocity, ft. per second	5,000	5,620
5. Angle of elevation	50° 48'	39'
6. Velocity of Vertex, ft. per second	2,267	2,270
7. Velocity point of fall, ft. per second	2,626	2,380
8. Ballistic coefficient	10	8.73
9. Angle of fall	54-40	54-51
10. Weight of projectile in pounds	330	265
11. Calibre in inches	8.3	8.66
12. Weight of powder in pounds	400	441
13. Length in calibre	130	168
14. Maximum pressure, lbs. per sq. in.	47,000	57,000
15. Volume of powder chamber in cu. in.	22,000	21,400
16. Volume of bore in cu. in.	70,700	88,500
17. The breech construction to be either of a number of powder chambers in the gun itself or a specially designed cartridge case to give successive or prolonged explosions of increment powder charges.		

**Bibliography.** The most satisfactory source of information on modern artillery is the current issues of the magazine *Army Ordnance* published at Washington by the Army Ordnance Association. There are also various official pamphlets published by the War Department. Few authoritative treatises dealing with modern artillery were produced after the World War, however, McFarland, *Ordnance and Gunnery* (New York, 1929) may be recommended. See EXPLOSIVES; ORDNANCE; TRENCH WARFARE; ARMIES AND ARMY ORGANIZATION; STRATEGY AND TACTICS.

**ARTÔT DE PADILLA, LOLA** (1886- ). A famous French lyric soprano, born at Sévres, near Paris. She was the daughter of the celebrated Desirée Artôt, from whom she received her entire musical training. After her very successful début at the Opéra Comique in Paris (1905), she made a tour of Scandinavia, Poland, and Germany, and from 1906-08 was a member of the Komische Oper in Berlin. After another tour, she was engaged at the Hofoper in Berlin (since 1918 the Staatsoper) in 1909, where she was one of the principal stars until her retirement in 1927. As a singer and actress, she was scarcely inferior to her distinguished mother.

**ARTS AND LETTERS, AMERICAN ACADEMY OF.** See ACADEMY OF ARTS AND LETTERS.

**ARTZYBASHEF, MIKHAIL PETROVITCH** (1878-1927). A Russian novelist (see VOL. II). Many of his works were translated into English, including *Satin* (1915), *The Breaking Point* (1915), *Voyna, War* (1918), *The Savage*, and the plays, *Jealousy*, *Enemies*, and *The Law of the Savage* (1923).

**ARZ VON STRAUSSBURG, ARTHUR, BARON** (1857- ). An Austro-Hungarian general, born at Hermannstadt, Transylvania. At the beginning of the World War, he commanded

the 15th Division on the Russian front, and later the 6th Army Corps. In 1913 he was associated with Mackensen in the vicinity of Przemyśl and later took Brest-Litovsk. In 1916 he commanded the 1st Army and defended Transylvania against the Rumanians. He was appointed to succeed Conrad von Hotzendorf as chief of the general staff of the Austro-Hungarian Armies.

**ASAKAWA, KWAN-ICHI** (1873- ). An American professor and author of works on Japan, born at Nihonmatsu, Japan (see VOL. II). He carried on special investigations in Japan, 1917-19. His later works include: *The Origin of Feudal Land Tenure in Japan* (1914); *Some Aspects of Japanese Feudal Institutions* (1918); *The Documents of Iriki* (1926), and contributions to *Japan and Japanese-American Relations* (1912) and *The Pacific Ocean in History* (1917).

**ASCHE, SHOLOM** (1880- ). A Yiddish playwright and fiction writer who went to the United States at the age of 30 after establishing a reputation as a novelist and dramatist in Germany and Russia. In 1907 Max Reinhardt produced his *God of Vengeance* in Berlin. The beauty and poetry of Asch's early work in novel and sketch are due to a certain literary naïveté enabling him to express himself most completely. His plays are considered inferior to his other work. His later dramatic pieces include *Die Familie Grossgluck*, *Der Bund der Schwachen*, *The God of Vengeance*, *Jephthah's Tochter*, and *Shabbethai Zebi*. Other published works include *Uncle Moses*, *Motike, the Vagabond*, and other stories of Jewish life. As an artist, Asch is rather to be classed with the modern Russian novelists and playwrights than with any of his Yiddish contemporaries.

**ASCHAM, JOHN BAYNE** (1873- ). An American clergyman and author, born at Vanlue, Ohio, and educated at Ohio Wesleyan University, Harvard University, and Boston University, in Italy and Germany, and at the American School of Oriental Research in Jerusalem. He entered the Methodist Episcopal ministry in 1897 and was ordained in 1899. He served in various churches in Ohio and was chaplain with the American Army in France, at the base hospital and hospital centre in Allerey, 1918-19. He was special visitor from the American Waldensian Aid Society to the Waldensian Church of Italy in 1921, and in the same year he was delegate to the Fifth Ecumenical Methodist Episcopal Conference in London. From 1916 to 1925, he was pastor of the Avondale Church, Cincinnati, Ohio; in the latter year, he became an executive of the national council of the Young Men's Christian Association and an associate secretary for special work in Turkey. He wrote: *Help from the Hills* (Cincinnati, 1910); *A Syrian Pilgrimage* (New York, 1914); *The Religion of Israel* (New York, 1918); *The Religion of Judah* (New York, 1920), and *Apostles, Fathers, and Reformers* (New York, 1921).

**ASCHE, OSCAR** (1872- ). An Australian actor, born at Geelong. He was educated at the Melbourne Grammar School and studied for the stage at Christiania, Norway. His first appearance was at the Opéra Comique. Subsequently, he played Shakespearean repertory for eight years with F. R. Benson and joined Sir Herbert Tree's company in 1902. In the following year, he acted with Ellen Terry in *The Vikings*. With Otho Stuart he managed the Adelphi The-

atre in 1904 and in 1907 took over the management of His Majesty's Theatre in London. Tours of Australia and South Africa followed. It was in 1916 that he appeared as Abu Hasan in his own play *Chu-Chin-Chow*, which reached its 2238th performance in July, 1921, thereby breaking all records of previous stage successes. In 1924 he played the part of Boudier in *The Royal Visitor*. With F. Norreys Connell, he wrote *Count Hannibal* (1910); he is also the author of *The Spanish Main* (1915), *Eastward Ho!* (1919), and *Mecca* (1920).

**ASHANTI**, ā-shān'tē, or **ASHANTEE**. A British protectorate in West Africa on the Gulf of Guinea, included in the Gold Coast Colony. It has an estimated area of 12,000 square miles, and in 1921, a population of 407,000, of whom 400 were Europeans. Though administratively Ashanti is an independent unit with a local judicial system in which the natives play an increasingly important part, economically it is to be considered a division of the Gold Coast. Railroad revenues and custom duties are all credited to the entire colony, with the result that the two territories cannot be disassociated (see **GOLD COAST**). Startling growth appeared in the native industry of cocoa culture, the output increasing from 9000 tons in 1913 to 70,848 tons in 1927. The result was an increase in native prosperity and the appearance of private property. On the other hand, the gold output has declined, the 1927-28 yield having been 103,511 ounces (valued at £439,942), as compared with the 1911 yield of 124,900 ounces (valued at £530,800). The native population consistently remained tranquil; schools were spreading through the protectorate; about 400 miles of motor road were built; European imports increased. In short, Ashanti was an example of a native African state rapidly on the road toward Europeanization.

**ASHFIELD, ALBERT (HENRY) STANLEY**, (1874- ). An English railway operator, born at Derby. He was educated at technical schools in the United States, and after successful American experience in railway management, he returned to England to undertake important positions in the same field. In 1916 he was a member of the Lloyd George government as president of the Board of Trade (1916-19). He was knighted in 1914 and created the first Baron of Southwell in 1920.

**ASHLEY, ROSCOE LEWIS** (1872- ). An American writer on civics and history. He was born at Rochester, N. Y., and was educated at the University of Rochester (1894) and Columbia University (1897). Since 1898 he has taught history and social science at Pasadena, Calif. He has been a member of the executive committee of the National Council of Teachers of Social Studies. His special interest has been the improvement of high-school courses and texts. He has published among other works, *The American Federal State* (1902; 2d. ed., 1911); *American Government*, for use in secondary schools (1903 and 1909); *Ancient Civilization* (1915); *Early European History* (1916); *Medieval Civilization* (1916); *Modern European Civilization* (1918); *The War and America* (1918); *The Practice of Citizenship* (1922); *The Constitution To-day* (1924); and *Human Outlook and Development* (1925).

**ASHLEY, THE RT. HON. WILFRID WILLIAM**, (1867- ). A British government official, educated at Harrow and Magdalen College, Ox-

ford. He served for many years in the militia and travelled in Africa and America before entering the House of Commons as a Conservative in 1900. He was a Conservative whip (1911-13), Parliamentary Secretary to the Ministry of Transport (1922-23), Under-Secretary of State for War (1923-24), and Minister of Transport (1924- ). He commanded a battalion in 1914-15, and became a Privy Councillor in 1924.

**ASHMUN, MARGARET ELIZA** (?- ). An American writer of stories for girls and books for English study. She was born at Rural, Wis., and educated at the Stevens Point (Wis.) Normal School and the University of Wisconsin. After teaching in schools, she was instructor in English at the University of Wisconsin from 1907-12. In the latter year, she removed to New York to engage in literary work. Besides contributing to magazines, she wrote several textbooks on English and *Stephen's Last Chance* (1918); *Marion Frear's Summer* (1920); *Topless Towers* (1921); *Including Mother* (1922); *Support* (1922); *The Lake* (1924); *No School To-Morrow* (1925); *School Keeps To-day* (1926) *Brenda Stays at Home* (1926); *Mother's Away* (1926), and *Pa—The Head of the Family* (1927).

**ASHTON, WINIFRED**. See **DANE, CLEMENCE**.

**ASHURST, HENRY FOUNTAIN** (1874- ). United States Senator from Arizona, born at Winnemucca, Nev. (see **VOL. II**). He was elected United States Senator in 1912 by the unanimous vote of the first legislative assembly of the State of Arizona and was reelected in 1916, 1922, and 1928.

**ASIA**, ā'shā or ā'zhā. See **EXPLORATION**, under *Asia*; **ETHNOGRAPHY**.

**ASIA MINOR**. See **TURKEY**; **SMYRNA**; **ARMENIA**; **CILICIA**; and other divisions. See also **ARCHAEOLOGY**.

**ASIR**, ā'shār or ā'zhā. See **ARABIA**.

**ASKWITH, GEORGE RANKIN** (1861- ). An English lawyer and arbitrator in industrial disputes, born in Morley, Yorkshire, and educated at Marlborough and Brasenose College, Oxford. He was knighted in 1911 and in 1919 he was raised to the peerage. In 1907 he was assistant secretary of the Board of Trade, in 1911 chairman of the Industrial Council, chairman of the Fair Wages Advisory Committee (1909-1919), and president of the Middle Classes Union (1921). He was chairman of the Council of the Royal Society of Arts (1922-24), president of the National Association of Trade Protection Societies (1924-27 and 1928), and president of the British Science Guild (1925-27). He wrote *Industrial Problems and Disputes* (1920) and *Taverns, their History and Laws* (1928).

**ASPHALT**. This mineral finds its chief use in paving and, although subject to keen competition from concrete and coal tars, it has more than held its own as reflected in an increased annual consumption, to meet the demands of millions of motorists in the United States for good roads. The production and manufacture of asphalt in the United States involves native asphalt, related bitumens, and asphalt and asphaltic materials manufactured from petroleum. The production of the native and related bitumen varieties in 1913 amounted to 92,604 short tons, valued at \$750,713, and in 1927 to 839,040 tons valued at \$5,605,850. In the latter year, sales of bituminous rock, the chief product of this group, accounted for 796,100 short tons of the total output, valued at \$4,672,280. For

many years Kentucky was the most important producing State for native asphalt, but sales at the mines in Texas in 1927 for the first time in several years exceeded those in Kentucky. Imports of native asphalt and bituminous rock into the United States in 1923 amounted to 129,138 tons, valued at \$1,079,906; while imports of crude asphalt in 1927 amounted to 157,082 tons, valued at \$1,138,898. In 1927, shipments from Trinidad (including Tobago) and Venezuela comprised 96 per cent of the total imports, with Venezuela showing a marked gain over Trinidad, as compared with 1926, and threatening to displace the latter in first place. Exports of unmanufactured native asphalt and related bitumens amounted to 38,875 short tons in 1927, valued at \$1,034,334, while the value of manufactures of these minerals was \$2,399,700, bringing the total value up to \$3,434,034.

With the growth and extension of the Western oil fields, an important industry was developed in recovering petroleum asphalt from crude petroleum oils of so-called asphalt-base obtained from California, Texas, and the mid-Continent fields in the United States, while crude oil from Mexico also was treated for this purpose at the various refineries. For a number of years, Mexican petroleum, which has a high asphalt content, figured prominently in the production of asphalt in the United States, but by 1927 there had been a material decline in the use of Mexican crudes, with the result that there was a corresponding increase in the proportion manufactured from domestic crude petroleum over previous years. The figures of the U. S. Bureau of Mines for 1927 show total sales of asphalt and asphaltic materials manufactured from domestic petroleum amounting to 1,525,420 short tons, valued at \$19,019,150 and manufactures from foreign petroleum amounting to 2,426,030, valued at \$35,771,940, or total manufactures amounting to 3,951,450 tons, an increase of 14 per cent over 1926. The domestic figures for 1927 compare with an output of 436,586 short tons, valued at \$1,079,906, in 1913. Manufactured asphalt in 1927 sold at an average of \$13.87 per ton, as compared with \$13.46 in 1926. Of the manufactured asphalts, the paving variety comprised 42 per cent of the total output, while the roofing and waterproofing branch of the industry used more than 1,000,000 tons of petroleum asphalt in 1927, which represented a larger increase over the previous year than was shown by paving asphalts. Exports of petroleum asphalt in 1925, the first year they were recorded separately, amounted to 89,014 tons, valued at \$1,762,048, as compared with 385,031 tons in 1927, valued at \$8,325,413. Imports of petroleum asphalt in 1927 amounted to 385,031 short tons, a gain of 163 per cent over 1926, which reflects the rapid increase in the use of petroleum asphalt throughout the world. Germany and the Netherlands rank first and second, respectively, as importers of asphalts from the United States. See PETROLEUM; ROADS AND PAVEMENTS.

**ASQUITH, HERBERT HENRY, EARL OF OXFORD AND ASQUITH (1852-1928).** A British statesman (see VOL. II). The months following the outbreak of the World War found Mr. Asquith, as premier, beset by many vexing problems. The question of conscription, the placing of the country's industries on a war footing, the turbulence of labor, and the series of unfortunate military expeditions, notably the Dardanelles campaign, on which the military com-

mand had embarked, embarrassed his ministry and aroused general discontent. In May, 1915, as a result of popular pressure, he was compelled to form a Coalition government, which included most of the prominent Unionist leaders and two Labor members. Mr. Asquith's hesitations and delays, however, estranged many of his colleagues, with the result that Winston Churchill, Sir John Simon, and Sir Edward Carson resigned from his cabinet in dissatisfaction. Meanwhile, his position rapidly became insupportable as a result of the loss of Lord Kitchener, who had been one of the mainstays of his government, failure to terminate the War speedily, and his inability to tighten the lines of the German blockade. The end came with the sudden resignation (Dec. 5, 1916) from his cabinet of Lloyd George, who had become identified by the country with a programme of vigorous aggression. Mr. Asquith's resignation soon followed, and thus ended a premiership of nine years. Until the end of the War, he supported the Coalition from the front opposition bench, but his decision to champion the Liberal principles once more met with a setback in his defeat in Lloyd George's khaki campaign of 1918. In 1920 he returned to Parliament as the result of a by-election. From then to 1922, he labored unceasingly in the interests of his party, but how little he had succeeded in restoring its prestige was shown by the election of November, 1922, when Labor moved up to second place and thus became the party of opposition. In 1926 he resigned as leader of the Liberal Party. He was created Earl of Oxford and Asquith, and made Knight of the Garter in 1925. In 1918 Mr. Asquith published *Occasional Addresses*, a volume of his speeches. Later publications are *The Genesis of the War* (1923); *Studies and Sketches* (1924); *Fifty Years of Parliament* (1926); *Speeches, 1887-1926*, a selection (1927), and *Memoirs and Reflections 1852-1927* (1928).

**ASQUITH, MARGOT (TENNANT)** (1864- ). An English author and widow of Herbert Asquith, former premier of England (see above). English society was very much perturbed when Mrs. Asquith's *An Autobiography* appeared in 1920. By a few it was regarded as remarkable, while others refused to take her publication as anything but a bid for publicity through impertinent self-esteem. Her later publications are *Places and Persons* (1925), *Lay Sermons* (1927), and *Octavia* (1928).

**ASSOCIATION TESTS.** A technique devised by the Swiss psychiatrist, Dr. C. G. Jung, for probing into a patient's neuroses. A list of words is read to the patient, who is asked to respond each time with the first word that comes to mind. By charting the time of response, noting the character of the response words, and by studying the patient's demeanor for any symptoms of emotion, the psychiatrist is able to get an insight into the type of ideas which worry him, and by means of these to diagnose the condition. Dr. Jung also uses the association test in preparation for the interpretation of a dream. The same association-test technique has frequently been used in experiments on the detection of crime. Words that are especially significant for the suspected person, because of their relation to a crime, are interspersed among other neutral non-significant words. The measures of guilt are the same as above. (H. W. Crane, "A Study in Association Reaction and Reaction Time," *Psychological Monographs*, 1915; and

W. M. Marston, "Reaction Time Symptoms of Deception," *Journal of Experimental Psychology*, 1920).

The term "association test" is also applied to a series of tests of the knowledge of logical relations, such as opposites, synonyms, adjective noun, verb-object, which have become a portion of almost every widely used test of intelligence (see R. S. Woodworth and F. L. Wells, "Association Tests," *Psychological Monographs*, 1911).

**ASTON, FRANCIS WILLIAM** (1877- ). A British scientist, winner of the Nobel Prize for chemistry (1922). He was born at Birmingham and educated at Malvern and Mason Colleges and Birmingham and Cambridge Universities, was assistant lecturer in physics at the former university (1909), and then entered Trinity College and the Cavendish Laboratory at Cambridge (1910), receiving his bachelor of arts research degree there two years later, and his doctor of science degree at Birmingham (1914). His experiments revealed the fact that non-radioactive elements are divisible into isotopes, discovered through his improved mass-spectrograph, and that most of the chemical elements are a mixture of isotopes and isobares. In 1920 he was made a Fellow of Trinity College, Cambridge. He received the medals of a number of British and foreign scientific societies and was a corresponding member of the Russian Academy of Science (1925) and a foreign member of the Reale Accademia dei Lincei in Rome. Besides many articles for scientific periodicals, he wrote *Isotopes* (1922). See CHEMISTRY.

**ASTOR, NANCY WITCHER LANGHORNE, VIS-COUNTESS**, (1879- ). An American by birth and the first woman member of the British Imperial Parliament. She is the daughter of the late Chiswell Dabney Langhorne of Virginia and the wife of Viscount William Waldorf Astor. When she won the election in Plymouth as Coalition Unionist candidate in 1919, it was not as a woman wholly ignorant of politics that she took her place in the House of Commons. She had always taken an active interest in her husband's former constituency. She soon became an active and picturesque member of the House of Commons, participating in many debates and acrimonious discussions. She was re-elected in May, 1929.

**ASTORGA, EMANUELE D'** (1680-1757). An Italian composer (see VOL. II). The current romantic account given there was first published by Fr. Rochlitz in vol. ii of *Für Freunde der Tonkunst* (1825) and generally accepted until the researches of Hans Volkmann proved the whole story fictitious. According to documentary evidence adduced by Volkmann, Astorga was born at Augusta, Sicily, Mar. 20, 1680, and died in 1757, either at Lisbon or Madrid. After receiving an excellent education in Augusta and Palermo, he entered the army and during the revolution in Palermo, in 1708, was an officer in the municipal guard. From 1712-17 he lived in Vienna, Znaim, and London, and in 1717-18 was senator in Palermo. After that, he lived in Spain in the diplomatic service of Philip V and Ferdinand VI. Although he had practiced music from childhood, he never took it up as a profession. His musical reputation was won through his only opera *Dafni* (Genoa, 1709), numerous chamber cantatas and especially his *Stabat Mater*. Consult Hans Volkmann, *Emanuel d'Astorga* (Leipzig, vol. i, 1910; vol. ii, 1919).

**ASTRONOMY.** The period after 1914 witnessed rapid and remarkable extensions of astronomical knowledge; new and powerful methods of investigation, leading to accomplishments formerly undreamed of, opened up whole new fields of inquiry and provided data for the solution of many problems of astronomy which used to be regarded as hopelessly beyond the power of man to solve. One of the most significant features of contemporary astronomical research is its close relation to the sciences of physics and chemistry; scores of illustrations might be advanced to show how often the clue to fundamental physical and chemical problems may be found in the cosmical laboratories of the stars, where the phenomena involve quantities of energy and extremes of temperature and pressure far beyond anything attainable on the earth, and, conversely, how frequently advances in pure physics aid in the solution of astronomical problems. It is also of considerable interest and importance that the laws found to hold within the narrow range of conditions obtaining in the terrestrial laboratory are found still to be valid under the conditions in, and throughout the immeasurably long lives of, the stars—factors unimportant in terrestrial phenomena sometimes assume a dominant rôle and give rise to unexpected and strange phenomena, but none of the laws known to hold on the earth needs to be replaced by something totally different; furthermore, the system of physical laws known to be valid in the region of the universe comparatively near the earth gives every evidence of still holding in the remote depths of the farthest observable reaches of space in which lie the distant island universes.

**The Solar System. Sun.** It is certain that, because of the high temperature, the outer part of the sun, down to a depth much greater than that to which we can see, is in the gaseous state, whatever may be the state of the far interior. The opacity of these gases is surprisingly great, because of their highly ionized condition; an ionized gas scatters light thousands of times more strongly than an ordinary gas, and the haziness thus produced increases so rapidly with the density that we can observe only a thin superficial layer on the sun. The luminous surface directly visible in a telescope is the photosphere, in which originates the light of the continuous spectrum. Above the photosphere lies the solar atmosphere, composed of luminous but nearly transparent gases, and divided into the reversing layer, some hundreds of kilometers thick, in which the Fraunhofer lines are mainly produced; the chromosphere, thousands of kilometers in thickness; and the corona, which extends outward hundreds of thousands of kilometers. The pressures in the solar atmosphere are almost negligible; the average pressure in the reversing layer is of the order of 0.0001 atmosphere, while that in the chromosphere is only  $10^{-10}$  atmosphere, or less than in any vacuum obtainable on the earth. Probably the whole amount of matter above the photosphere is about equivalent to a layer of ordinary air ten feet thick; only the great thickness of the solar atmosphere permits it to be seen at all.

The investigations of E. A. Milne and others have shown that in the reversing layer of a star, radiation pressure commences to become increasingly effective in supporting atoms against gravity, and in the chromosphere the atoms are supported almost entirely by such pressure. The

pressure in question, however, is that arising from the *selective* absorption that produces the dark lines in the spectrum; in contradistinction to the *general* radiation pressure so important in the *interior* of a gaseous star, this selective radiation pressure begins to be important only near the surface: The pressure exerted by radiation of any particular wave-length is proportional jointly to the net outward flux of radiation of that wave-length and to the degree of obstruction offered by the absorption coefficient; at a point in the interior, the inward and the outward streams of radiation of a wave-length close to one of strong selective absorption are very nearly equal, since each (being unable to penetrate far) must have originated close by, but near the boundary there is little inward flux, the atoms are exposed to the full brunt of the outward stream alone, and the intense selective opacity gives rise to a large unbalanced radiation pressure which pushes the atoms outward. Internal mechanical equilibrium under a steep pressure gradient, gravity, and general radiation pressure thus shades off into equilibrium under a small pressure gradient, gravity, and strong selective radiation pressure.

The spectroheliograph, with which photographs may be taken in the light of a single chemical element at any desired level in the solar atmosphere, and the spectrohelioscope, with which visual observations of the same nature may be made, have revealed many remarkable details of structure entirely lost in ordinary observations. Investigations with these instruments, by Hale and others, have demonstrated that sunspots are great whirling or vortical storms in the solar atmosphere. The motion of the vapors overlying the spots is radially outward from the centre of the spot in the lower levels and inward in the higher levels. The actual vortex appears to be deep-seated, beneath the photosphere, with its top near the reversing layer; the inflow from the chromosphere, which causes the vortices exhibited by the hydrogen flocculi, is a secondary effect of a purely hydrodynamic character, produced in the high levels, where the direction of whirl is independent of that of the spot vortex below, and in general obeys the same law that governs the direction of rotation of terrestrial cyclones.

Shortly after J. J. Thomson and others had shown that negatively and positively electrified particles must occur in great numbers in a hot gaseous body like the sun, Hale, by means of the Zeeman effect, found that a magnetic field existed in and about every sunspot. This field presumably is produced by the vortical whirling of charged material, preponderantly of one sign, although no Stark effect has been detected in the solar spectrum and it seems almost certain that no electric field exists in the spots. The strength of the magnetic field increases, up to about 3500 gauss, with the diameter of the spot. "Invisible sunspots" have actually been detected at Mount Wilson by searching for evidences of their Zeeman effect in promising regions, and this confirms the view that a spot representing a vortex which becomes visible only when cooling due to expansion is sufficiently great to produce a perceptible decrease in the brightness of the photosphere. The sun has been found to possess a *general* magnetic field also, the intensity of which diminishes rapidly with altitude above the photosphere; its maximum intensity is about 50 gauss.

Sixty per cent of the spots consist of two spots or groups of spots of opposite magnetic polarity, as if they represented the two ends of a single vortex filament; 30 per cent of the remainder show a tendency toward the bipolar type. Before the sunspot minimum of 1912, the western member of each pair in the northern solar hemisphere was of south, or negative, polarity, the eastern member of north polarity, and vice versa in the southern hemisphere; these conditions were exactly reversed in the spots of the next cycle, the western members in the northern hemisphere being of north polarity; and another reversal, back to the conditions existing prior to 1912, took place at the minimum of 1923. Assuming, as seems probable, that the sign, as yet unknown, of the dominant charge is the same in all solar vortices, opposite polarities indicate opposite directions of whirl; and the reversal of polarities at minimum represents a periodic reversal of direction of whirl. The true period of solar changes is hence 22 years instead of 11. The sign of the general magnetic field of the sun apparently remains unchanged; and no connection can be found between the polarities of spots and the directions of whirl of the high-level vortices. The origin of the spot vortex itself is not known, but must lie within the sun.

Four belts are prolific in prominences; two of which coincide with the sunspot zones; and although the number of prominences is roughly proportional to the number of spots, O. J. Lee and Mr. and Mrs. Maunder have shown that there is rarely any direct association between the two phenomena, as was formerly thought to be the case.

Fifty-seven of the known chemical elements had been found in the sun by 1929, and there can be but little doubt that all the others are present. The spectra of some elements are still incompletely investigated; some have lines lying mostly too far in the ultra-violet or the infrared to be easily observable in the solar spectrum; and the physical conditions in the sun are such as to prevent the lines of some elements from being intense enough to be seen. Those elements not yet identified are nearly all of either high atomic weight (and therefore liable to sink below the visible surface) or high ionization potential (and therefore with lines difficult to excite); the elements with low ionization potentials are known all to be present.

Modern physical theories of the origin of spectra render it probable that the unidentified lines in celestial spectra are due to familiar elements under physical conditions not yet reproduced in the laboratory. Many lines of known elements, predicted by spectroscopic theory but not yet observed on the earth, have been found among the previously unidentified lines in the solar spectrum; and Freeman has found that nearly all the emission lines in the spectrum of the corona are due to argon.

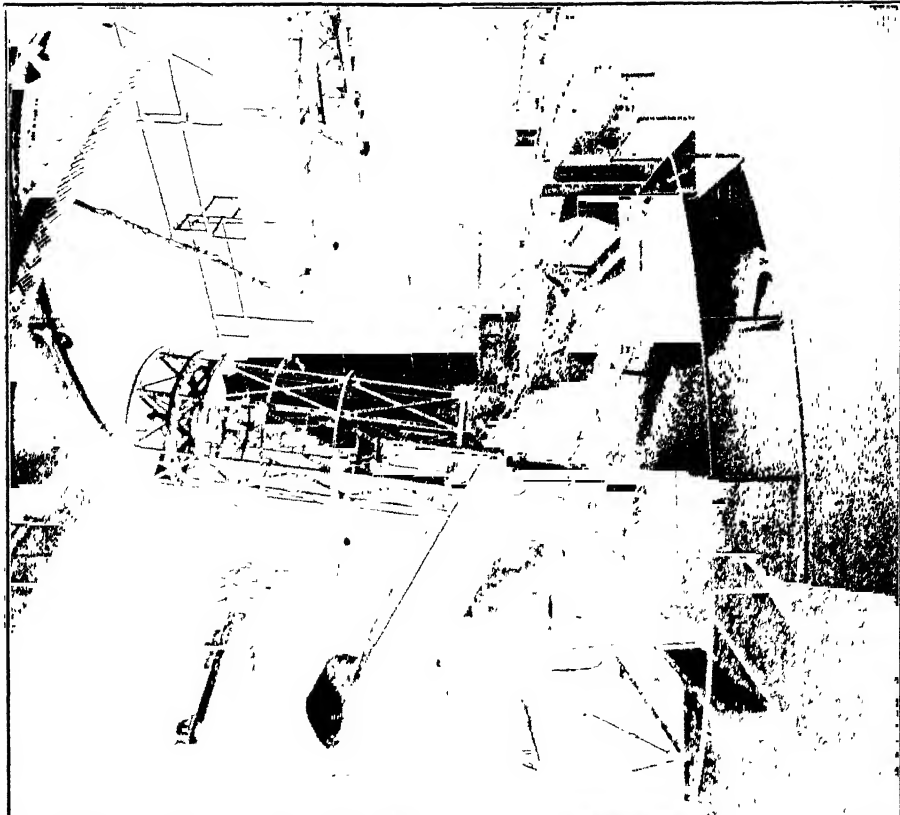
Studies of the width, blackness, and "wings" of the Fraunhofer lines, and of the intensities of mutually related lines known as "multiplets," have made it possible, with the help of modern spectroscopic theories, to estimate the relative abundance of the different elements in the atmospheres of both the sun and the stars; it is found that a million times as many atoms are active in producing the strongest lines in the solar spectrum as in giving rise to the lines barely visible.

## ASTRONOMY



*Courtesy of the Dominion Astrophysical Observatory*

The 72-inch Reflector of the Dominion Astrophysical Observatory,  
Victoria, B. C.



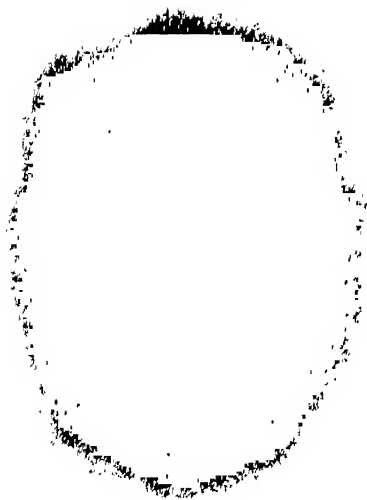
*Courtesy of the Mt. Wilson Observatory*

The 100-inch Hooker Reflector of the Mt. Wilson Observatory,  
California

## LARGE REFLECTING TELESCOPES



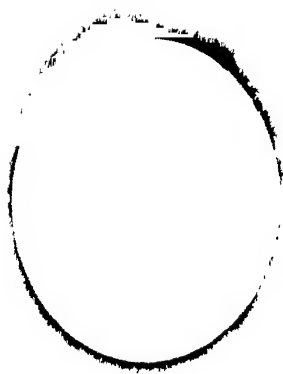
ASTRONOMY



*Photo by Frederick Sloum*

THE CORONA

THE TOTAL ECLIPSE OF THE SUN, JANUARY 24, 1925  
As seen from Van Vleck Observatory, Wesleyan University, Middletown, Conn.



*Photo by Frederick Sloum*

INNER CORONA AND PROMINENCES

*Solar Radiation Studies.* At the Astrophysical Observatory of the Smithsonian Institution, instruments and methods for daily measuring the intensity of solar radiation were improved, and three additional stations established, at Calama, Chile, Mt. Harqua Hala, Ariz., and in South Africa. The "solar constant" is found to be low during years of solar quiescence and high during the years of sunspot activity; and in addition to this 11-year variation, it apparently exhibits minute irregular fluctuations extending over periods of a few days or weeks.

*Planets and Satellites.* The radiation, exclusive of reflected sunlight, emitted by the moon and the planets, has been measured by Pettit and Nicholson, and by Coblentz and Lampland. The results indicate that the surface temperature of the moon rises far above the boiling point at midday, but sinks to about  $150^{\circ}\text{C}$ . below zero during the lunar night. On Mars, the equatorial temperature conditions at noon during the summer season may not be unlike the bright cool days on the earth; the surface temperature rises at times to perhaps  $50^{\circ}\text{F}$ ., but the temperature of the atmosphere is probably very much lower. Spectroscopic observations at Mount Wilson indicate that the quantity of water vapor present in the Martian atmosphere is only 5 per cent of that normally found in the earth's atmosphere, while the amount of oxygen is less than that above Mt. Everest. Observations are unable to penetrate below the high cloud layers on Venus, but the comparatively high temperature found for the dark hemisphere indicates a short period of rotation; both oxygen and water vapor appear to be absent above the cloud surface. The temperatures of the outer planets are extremely low— $140^{\circ}\text{C}$ . below zero in the case of Jupiter—though apparently too high to be maintained by solar radiation alone; the thick clouds would, however, be an effective blanket to outgoing radiation; hence, the surface temperatures may be much higher than those observed. Mercury, with its negligible atmosphere, rises to over  $400^{\circ}\text{C}$ . on the sunlit side.

Photographs of the moon and the planets, taken in monochromatic light by Wood, Wright, Ross, and others, have given many interesting results. Mars, for example, when photographed through a color screen allowing the passage only of deep-red light, shows a wealth of surface detail, but in violet light the disk is of uniform intensity except for the polar caps; hence it is concluded that the Martian atmosphere, like our own, strongly scatters light of short wavelength, so that photographs in such light show only the atmosphere, the surface features being obliterated. The larger diameter of the violet images indicates a depth of about 60 miles for the atmosphere. Clouds often appear, but their exact nature is uncertain.

A ninth satellite of Jupiter was discovered by Nicholson at the Lick Observatory in 1914. Over 1,100 minor planets have received permanent numbers; Hirayama has shown the existence of several groups or families of minor planets, the orbits of which have the characteristics that would have resulted if the members had been formed by the explosive disruption of a single parent mass.

*Comets and Meteors.* Comets, in addition to reflecting sunlight, are stimulated to glow as they approach the sun; the origin of this self-luminosity was not understood until explained by modern physical theories of radiation: It is

now known that an atom or molecule in a given state of ionization is incapable, if left to itself, of permanently containing more than a certain definite amount of internal energy; and if more than this normal amount is in any way acquired—e.g., through the selective absorption of radiant energy—the excess ordinarily is given out again almost immediately in the form of radiation. The bright bands in cometary spectra are due to the reëmission of the same wave lengths selectively absorbed from sunlight by molecules of chemical compounds that remain gaseous at very low temperatures.

The observed motions of the matter in cometary tails are not yet fully understood. The material is in some way ejected from the nucleus with considerable velocity, and moves under the combined influence of gravitation and of repulsive forces from the sun. An investigation, by Bobrovnikoff, of the motions in the tail of Comet Morehouse 1908 III has shown that the repulsive force acting was exactly of the amount that Baade and Pauli calculated would be exerted on ionized carbon dioxide molecules under radiation pressure from the sun, and the spectrum showed the tail actually to consist chiefly of this gas. The matter was ejected directly away from the sun. These results do not agree with the Bessel-Bredichin theory of the formation of the tail from envelopes ejected on the sunward side.

There is no evidence at present that any comet has entered the solar system from without; all appear to approach the sun in genuine ellipses of extreme eccentricity, but planetary perturbations sometimes change the orbit to a hyperbola and send the comet out of the system. Russell has shown that the supposed cometary families of Saturn, Uranus, and Neptune have little or no foundation in fact; that of Jupiter, however, is genuine.

A comet discovered by Skjellerup, Dec. 3, 1927, and independently by many other observers, reached daylight visibility while close to the sun, but faded thereafter with extreme rapidity; no other comet conspicuous to the naked eye appeared in 1914-1928. The earth narrowly escaped a collision with Pons-Winnecke's Comet in June, 1921.

*The Sidereal Universe.* Past researches on the fundamental problems of sidereal astronomy had to deal with a restricted class of data, limited to a comparatively small number of stars; this is rapidly ceasing to be the case. Through the use of photography, the determination of spectral types, positions, magnitudes (photographic and photovisual), color indices, and trigonometric parallaxes has been greatly accelerated; the number of known proper motions and radical velocities is steadily increasing. Many new methods of determining stellar parallaxes, temperatures, etc., have been devised. Accurate measurements of the heat from the stars are possible by the use of improved thermocouples; and Abbot, with a spectrophotometric apparatus capable of detecting temperature differences of  $1/100,000,000$  degree, has determined the spectral energy distribution and effective temperatures of the brighter stars.

The most spectacular achievement was the measurement, at the Mount Wilson Observatory, of the angular diameter of several stars by means of an apparatus (devised by Michelson) consisting essentially of a 20-foot interferometer attached to the 100-inch reflector. On the night of Dec. 13, 1920, Betelgeuse was found to have

a disk  $1/20$  of a second of arc in diameter; the parallax is not known accurately, but the star cannot be less than 200,000,000 miles in diameter. Antares and Arcturus have been found to be 400,000,000 and 21,000,000 miles in diameter, respectively, while Mira is 250,000,000, Aldebaran 30,000,000, and Scheat 150,000,000. Betelgeuse varies in diameter.

The above data, in connection with the new knowledge furnished by modern physics, have led to a complete transformation of large parts of astronomical science.

*Physical Conditions in the Stars, and Stellar Evolution.* Over 99 per cent of the stars fall into the spectral types B, A, F, G, K, and M on the Harvard Classification (corresponding to Types I-III of Secchi), which forms a continuous and linear series; this is strong evidence that the principal differences in stellar spectra arise in the main from the variation of a single physical condition in the stellar atmospheres, and it is now generally agreed that this condition is temperature. If we could gradually heat up a red star, the numerous metallic lines would fade out and the lines of helium, nitrogen, etc., would appear.

Saha has shown that this would be brought about by the influence of temperature and pressure on the state of ionization of the atoms, without any change whatever in the chemical composition of the stellar atmospheres: For example, the H and K lines of calcium, which are produced in the highest levels of the solar atmosphere far above the luminous region of sodium, magnesium and other lighter elements, are the "enhanced" lines, due to a calcium atom which has lost one electron; in the high levels of the chromosphere, where the ionization (which is only partial at the higher pressures of the lower levels) becomes complete, neutral calcium disappears, while the lines representing the ionized atoms remain conspicuous; but the lines corresponding to the ionized atoms of the other elements present fail to appear because they happen to lie in the extreme ultra-violet. Again, as we pass from the cooler to the hotter stars, we find the easily ionized atoms of the metals losing one electron. As the percentage of ionized atoms grows, the ordinary lines of the metals grow weak and vanish, while the spark lines appear and strengthen; at still higher temperatures, the ionized atoms lose a second electron and pass into a state in which they give rise to practically no lines at all in the visible spectrum, while the lines of hydrogen and helium, difficult to excite at low temperatures, appear. The stellar spectra unfold to us in an unbroken sequence the physical phenomena which succeed each other as the temperature varies from 3000° to over 30,000°C. Similarly, the enhanced, or spark, lines of the elements are weakened in sun-spot spectra, because of the lower temperature, while the lines prominent in the flame and the arc (due to neutral atoms) are strengthened.

The *absolute magnitude* of a star is defined as the magnitude it would have if at a distance corresponding to a parallax of 0.1 seconds of arc. Obviously, the *apparent magnitude* depends jointly on the absolute magnitude and the real distance of the star; and the absolute magnitude in turn is determined by the intrinsic luminosity per unit surface area (which depends on the temperature) and the size of the star. It is to be expected that stars having the same type of spectrum and hence the same tempera-

ture, will have the same surface brightness; if they differ in *absolute* magnitude, it will be by virtue of a difference in size. Now, when classified by spectral type and *absolute* magnitude, the stars are found to fall mainly into three distinct groups. One group consists of stars all of great luminosity, varying little in absolute magnitude from type to type; another, to which the sun belongs, consists of stars whose absolute brightness falls off rapidly with increasing redness. These two groups are distinctly separated in types K and M, all K and M stars being either very faint or very bright, none intermediate, but are partially intermingled in type F and thoroughly so in type A, all B and A stars being very bright. The third group consists of stars of extremely high surface temperatures and hence early type spectra, but very low absolute luminosity, of which few have yet been discovered, but which must exist in space in enormous numbers.

The stars of high luminosity are called "giants"; those of low luminosity, "dwarfs"; and those of the third group, "white dwarfs." What is known as the "main sequence" runs continuously from the intensely luminous type O stars to the faint M stars, and comprises all the ordinary dwarf stars as well as most O, B, and A stars; the giants form a side group that joins the main sequence near type F, though it does not link on continuously—few giants of type F have been found. The names giant and dwarf were originally intended to apply to the relative brightness, but it is found that in general they correctly describe the relative size as well; a giant star must be larger than a dwarf of the same spectral type. The stellar diameters which have been measured with the interferometer are those of giant stars, and they agree well with the diameters which may be computed theoretically from absolute magnitude and temperature. The differences in the sizes of the stars must be due mainly to differences in density; for in striking contrast to the enormous range of observed stellar luminosities, corresponding to a light ratio of over 100,000,000 to 1, stands the comparative uniformity of stellar masses, as the study of the binary systems has shown. With few exceptions, the masses of the stars lie between  $\frac{1}{2}$  and 15 times that of the sun, the majority of them between  $\frac{1}{2}$  and 2 times the sun's mass. It is inconceivable in the light of present known facts that the vast bulks of the giants can be due to anything other than the diffuseness of the matter composing them. A typical giant star is to be looked upon as a mass of gas with *average* density about that of our atmosphere, swollen to at least 1000 times the bulk of the sun; the dwarfs, however, are comparable in density and size with the sun, while the white dwarfs are smaller and have extraordinarily high densities.

On the basis of these and other facts, Russell and Hertzsprung independently put forth the "giant and dwarf hypothesis" of stellar evolution, about 1914, although somewhat similar views had been maintained for some time by Lockyer: A mass of hot gas, isolated in space, radiates heat and consequently contracts; Homer Lane in 1870 showed that so long as the density is low enough for the ordinary gas laws to be obeyed approximately, the temperature of the mass must rise with contraction, beginning to fall only when the density begins to approach that of a liquid. Hence, a gaseous star, starting

as an immensely inflated tenuous mass of density perhaps  $1/100,000$  of that of our sun, would condense, its temperature rise, and its original reddish color change through yellow to white; and the first of the above groups of stars, the giants, were, on this hypothesis, assumed to comprise stars in this ascending stage of evolution; their absolute magnitudes would depend but little on spectral type, because their rising temperatures would compensate for the decreasing surface areas. Finally, a critical point would be reached, at a density of one or two tenths that of our sun, the temperature would begin to fall, and the color go through yellow to deepening shades of red as the star approached final extinction; the second of the above groups, the dwarfs, were supposed to comprise stars on this descending branch; here, the decreasing temperature and diminishing surface area would cause a rapid fall in brightness with advancing type. During the life history of a star, any given temperature would be passed through twice, the maximum temperature being associated with middle age.

The fact that in the giant stars the material is thus in the simple form of a perfect gas makes it possible to infer something about the distribution of pressure, temperature, and density throughout the interiors. To begin with, the main bulk of the star must consist of matter which, as a consequence of the high temperatures, is to a large extent broken up into its constituent electrons and atomic nuclei, the resulting mixture of electrons and of atoms in various stages of ionization behaving approximately like a mixture of perfect monatomic gases. Furthermore, the energy-carrying capacity of electrons, atoms, and convection currents is found to be so insignificant in comparison to that of radiation that the energy radiated from the stars must be brought to their surfaces, not by convective transfer of matter, as was formerly supposed, but mainly by radiation and absorption within the star: At any point within, the gases settle down, in thermal equilibrium, to the temperature of which they radiate an amount of energy equal to that which they absorb from the radiation flowing through from below.

The energy of atomic motion in a gaseous star constitutes a great store of heat, but not the principal part of the star's total energy. The ether inside the star is full of radiation waves hastening in all directions; these waves are enclosed in the material, which prevents them from leaking into outer space except at a slow rate. An ether wave may thread the maze for hundreds of years before finding its way out at the surface. Of course, all hot bodies possess this double store of material heat and ethereal heat, but in all bodies with which we are directly familiar the ethereal portion is a most insignificant part of the whole—only in the giant stars does it rise to importance. This intense ethereal energy inside the star exerts a strong pressure, distending the star, and bearing to some extent the weight of the overlying layers: The temperature gradient within causes an outward flow of radiation, while the opacity of the stellar material obstructs this flow; at the high temperatures which exist inside a star, the radiation consists mainly of soft X-rays to which the matter is highly opaque; hence, the radiant energy leaks out slowly, and, in doing so, exerts a large pressure and incidentally is gradually

transformed into radiation of longer wavelength. The total pressure at any point is the sum of the gas pressure and the radiation pressure; and at each point there is a mechanical equilibrium between the gravitational compressive force due to the weight of the overlying material and the expansive forces of gas pressure and outward radiation pressure. The internal distribution of pressure, temperature, and density in a gaseous star of given mass and radius, and hence the outward flux of energy, the total radiation, and the absolute magnitude, may be found by solving the mathematical equations which express the above conditions necessary to mechanical and radiative equilibrium.

In this way, Eddington was led to a formula for the absolute magnitude of a gaseous star which indicated that stars of the same mass ought all to be about equally bright, regardless of size or spectral type, the mass being smaller the fainter the star. This formula, derived on the explicit assumption that the gas laws were obeyed, was unexpectedly found to predict correctly the observed magnitudes of dwarfs as well as giants; apparently, therefore, the dwarfs, in spite of their great densities, also obey the perfect gas laws. Now, deviations from these laws are the result of the finite size of atoms, and arise when the atoms are packed too closely together; Eddington pointed out that, at the high temperatures of stellar interiors, the "effective size" of the atoms is so much reduced by the loss of the outer electrons that the material might very well be compressed to densities thousands of times that of water before it would deviate appreciably from a perfect gas. This hypothesis provided an explanation of the white dwarfs; the companion of the binary Sirius, for example, is fainter than the sun and nearly as massive, but of type F; if it really has the surface brightness indicated by its spectrum, it could be only three times the diameter of the earth, and hence would have a density about 50,000 times that of water. After Eddington's suggestion, the spectrum of this star was examined for the shift of the lines predicted by the theory of relativity, and the discovery that such a displacement was present, of the theoretical amount, verified both Eddington's hypothesis and the theory of relativity.

The realization that even in the dwarf stars the dismembered atoms are so small that the material obeys the perfect gas laws necessitated the abandonment of the giant and dwarf hypothesis of stellar evolution, which postulated the failure of the gas laws in the dwarfs. The low surface temperatures of the dwarf stars must be due, not to low internal temperatures, but to increased opacities; all stars must be growing hotter inside.

The particular assumptions adopted by Eddington in deriving his formulae have been criticised by Jeans, who has obtained an alternative set of formulae on the basis of different assumptions; however, these latter also indicate that stars of a given mass must lie within rather close limits of absolute brightness, and moreover the mass-luminosity law is found by observation to hold, regardless of the validity of the theoretical deductions of this law so far given. Apparently, as a star radiates away energy and declines in luminosity, its mass decreases; now, modern physics has discovered an equivalence between mass and energy similar to that between heat and work, such that any physical

system upon losing energy decreases in mass, and the secular diminution of stellar masses must apparently be due to the actual conversion of mass into an equivalent amount of energy which is then radiated away. The sun, at the present rate of radiation, is decreasing in mass by about 4,000,000 tons per second.

The secular annihilation of matter within the stars, perhaps through the coalescence of electrons and protons, and its transformation into radiant energy, is probably the main source of the stellar radiation sent out into space: A star must certainly have some source of energy-supply other than that of contraction, in order to keep up its vast stores of material and ethereal energy and maintain its radiation. A great variety of geological, biological, and astronomical evidence indicates that the length of life of a star must be of the order of  $10^9$  years; the only source of energy adequate to provide such a time-scale and to account for the diminution of mass with decreasing luminosity appears to be the transmutation of matter into energy.

The law of generation of internal heat in a star, together with that of the rate of escape of heat to space, will determine how bright and hot a star of given size and mass will be; the rate of escape is determined by the opacity and the temperature gradient, but the latter will itself be influenced by the distribution of the source of energy through the body of the star. Since the laws governing the liberation of energy appear to be the main determining factor in stellar evolution, the distribution of the source within the star and the mechanism by which the energy is released become of especial importance for the construction of a theory to replace the giant and dwarf hypothesis; at present, however, these problems are largely matters of speculation, and general agreement has not yet been reached between different investigators. Russell and Eddington maintain that the rate of transmutation of a given kind of matter increases with temperature and pressure, while Jeans holds that if this were true the stars would be explosively unstable; Jeans assumes each kind of matter to transform at a fixed rate, and concludes that the energy of the stars comes mainly from the transmutation of elements of atomic weights higher than any found on the earth. Each view has been made the basis for a new theory of stellar evolution.

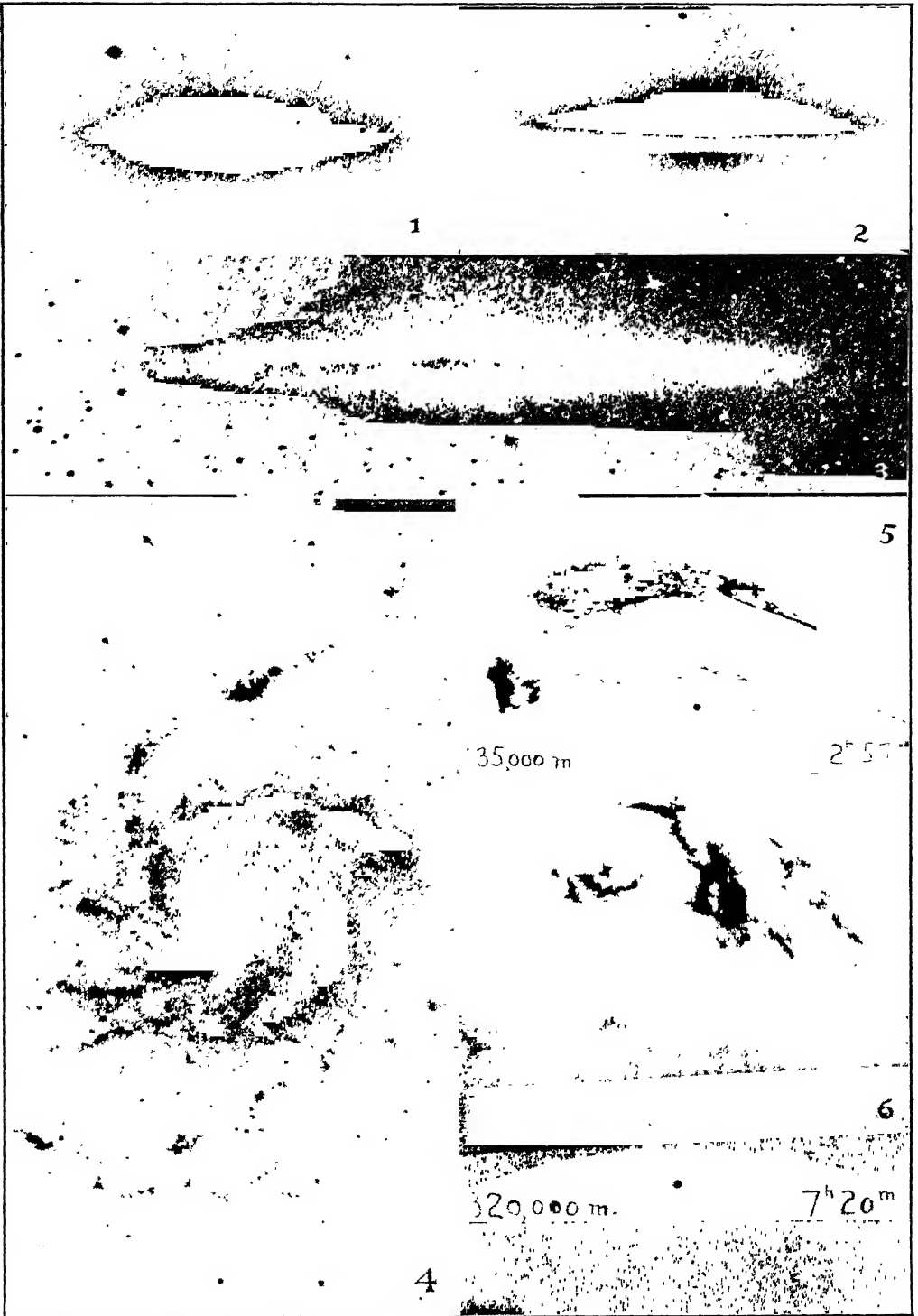
Furthermore, his most recent investigations have led Jeans to the conclusion that, under any circumstances, a gaseous star would be dynamically unstable, and that such extensive departures from the gas laws are necessary to produce stability that the condition of a large part of the mass of any actual star (though not necessarily a large part of its volume) is better described as liquid than gaseous; the prevalence of binaries, which have almost certainly been formed by fission, supports this theory, since Jeans has shown that fission cannot take place unless the internal state approximates to incompressibility. In a liquid star, radiation pressure ceases to be of any importance. Jeans suggests that a star is first born out of a nebula, with a density so low that it is gaseous throughout, and hence unstable. The star will either contract rapidly until substantial deviations from the gas laws in its interior render it stable, or, if its mass be large, it will pulsate within a period of a few hundred days and begin life as a long-period variable.

Once the star has become stable, its further evolution is determined by the rate of transformation of matter into energy. As the star loses mass and radiating power through the annihilation of active elements and the radiation of the resulting energy, it slowly contracts and the internal temperature and density increase. The rise in temperature causes the atoms to become more and more highly ionized; now, in an atom the external electrons are distributed around the nucleus in successive "shells" or "rings," and at different stages of ionization the atoms are of very different "effective sizes."

As the density increases because of the contraction, the atoms become more closely packed together, but as each ring of electrons is in turn finally stripped off by the rising temperature, the packing is relieved through the consequent decrease in size of the atoms. The liquid state is most closely approached just before a ring is lost, while just afterwards there is a short period of instability and rapid contraction during which the star is gaseous. The evolution of a star consists in a series of drops from one stable configuration to another, together with a slow steady progress through each such configuration; the giant, dwarf, and white dwarf groupings represent stable states, separated from each other by unstable configurations in which few stars exist. The main sequence is composed of stars in which most of the atoms in the interior are ionized down to the so-called K ring, and packed together until they form a liquid; as a star slowly contracts and gets hotter, it moves down the main sequence until ionization of the K ring finally begins, when it quickly passes through an unstable condition and becomes a white dwarf. In the giant stars, the atoms in the interior are ionized down to the L ring; in the white dwarfs most of the atoms have lost all their external electrons and in this condition seem to be immune to annihilation—the little energy which the white dwarfs can generate and radiate comes from their cooler outermost portions where the atoms are not so completely ionized.

Spectrum lines are produced in the outermost, highly rarefied, regions of stellar atmospheres, where the pressures are negligibly small—perhaps of the order of those in a vacuum arc. Stars of the same spectral type, but of different absolute magnitudes, are found to exhibit slight differences in the character and intensity of those lines which are peculiarly sensitive to the physical conditions under which they are produced. These spectral differences between giants and dwarfs are brought about by differences in the density and depth of the atmospheres: In the case of stars of the same mass and luminosity, but different sizes, surface gravity and radiation pressure—the two things which determine the equilibrium of a stellar atmosphere—are both less the greater the diameter, but in the same proportion, so that the atmospheres are of the same extent; but in the case of stars of different masses, radiation pressure increases with mass much faster than surface gravity, hence the massive stars have much more extensive atmospheres than the less massive stars. When surface gravity is low and radiation pressure is strong in comparison, an extensive atmosphere of low pressure and density exists; the low pressure leads to extensive ionization, and the enhanced lines are relatively strong; these are the conditions in giant stars, whereas in

# ASTRONOMY



Courtesy of the Mount Wilson Observatory

Courtesy of Yerkes Observatory

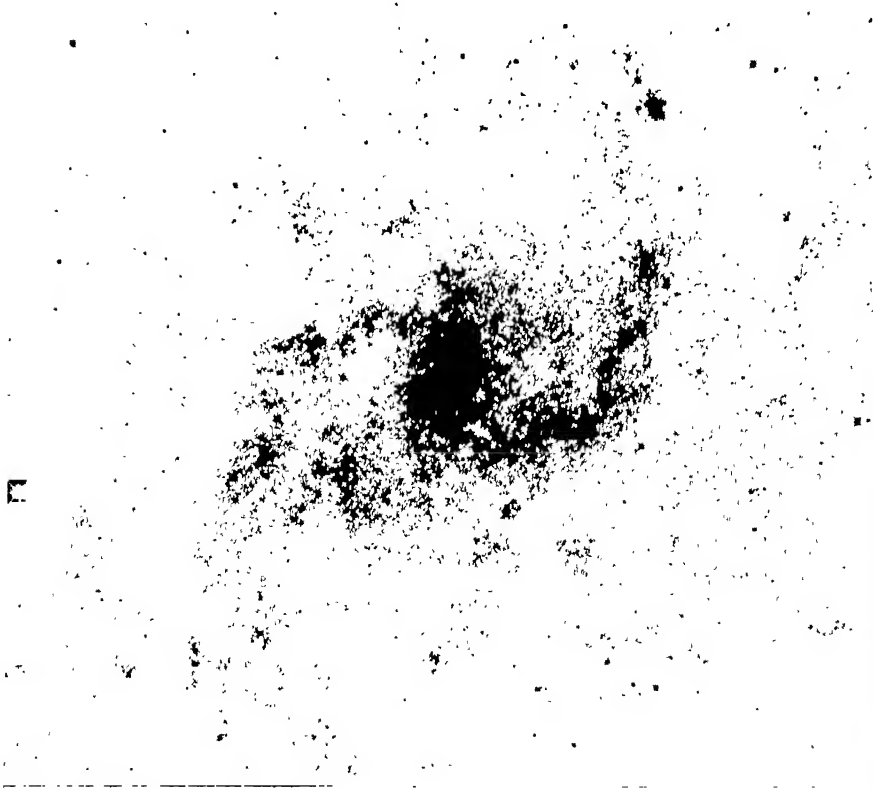
## NEBULÆ ILLUSTRATING SUCCESSIVE STAGES OF EVOLUTION ACCORDING TO THE THEORY OF J. H. JEANS

1. N. G. C. 3115. 2. N. G. C. 4594. 3. N. G. C. 891. 4. M 101.

5 and 6. Two successive views of the extraordinary solar prominence of May 29, 1919, showing heights attained. White dot represents size of earth

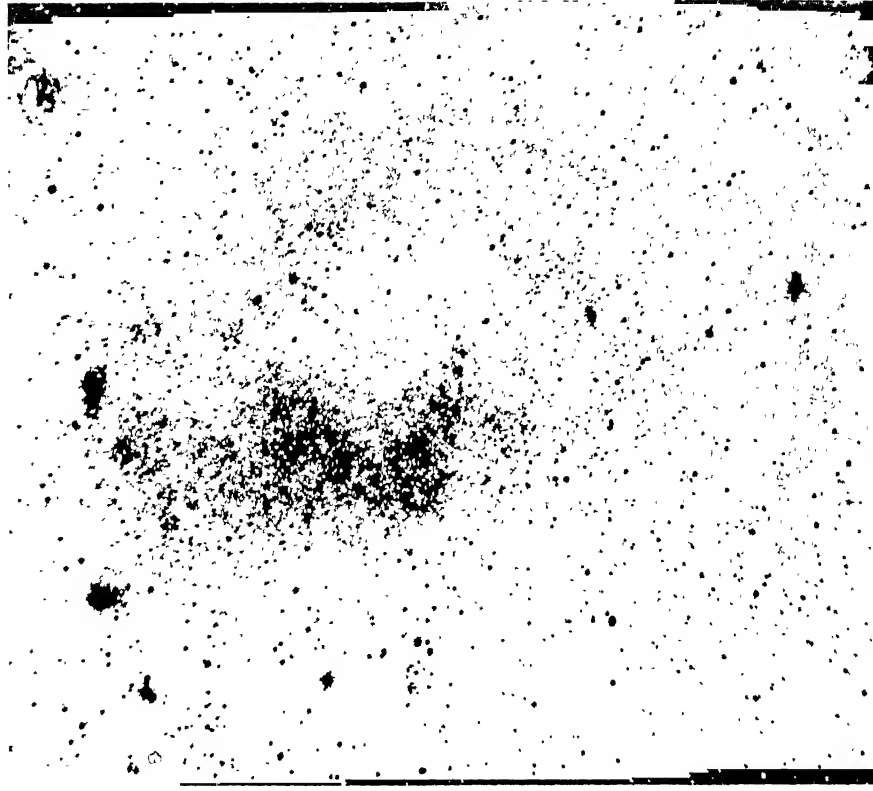


## ASTRONOMY



*Courtesy of the Mount Wilson Observatory*

The Spiral Nebula Messier 33 in Triangulum; Exposure, eight hours 30 minutes. The original negative was made with light that had left this remote stellar system 850,000 years previously.



*Courtesy of the Mount Wilson Observatory*

## ISLAND UNIVERSES

The Star Cloud N. G. C. 6822 in Sagittarius. Light, traveling at a speed that would girdle the earth seven and a half times in one second, requires 700,000 years to reach us from this system.

the dwarfs the enhanced lines are weakened and the low-temperature lines strengthened. The relation between absolute magnitude and the relative intensities of sensitive lines may be found from a study of the spectra of stars of known parallax, and may then be used to determine the absolute magnitudes, and hence the distances, of other stars from their spectra alone. Thousands of these spectroscopic parallaxes have been determined.

**Variable Stars.** Among the brightest and most massive of stars are the Cepheid variables, most of which are of spectral types F and G. The type, and presumably, therefore, the surface temperature, changes during the variation, the change in brightness being due to the periodic heating and cooling. The most plausible explanation of Cepheid variation is the pulsation hypothesis of Shapley, which postulates a regular dilation and contraction of the star. The semi-amplitude of the oscillations necessitated by observed spectroscopic radial velocities in Cepheids is from 4 to 14 per cent of the radii.

A remarkable relation between absolute magnitude and period has been found for the Cepheids by Miss Leavitt, such that from the observed period the absolute magnitude, and hence the distance, may be computed. The globular clusters, the Magellanic Clouds, and some of the spiral nebulae contain many Cepheid variables, and this relation affords a means of determining their distances.

**Nova Aquilæ III**, discovered during the total solar eclipse of June 8, 1918, was the most brilliant nova since Kepler's Star of 1604; normally an irregular variable of the tenth or eleventh magnitude, it attained a brightness of -0.5 magnitude on June 9. **Nova Cygni III**, normally a faint star below the fifteenth magnitude, rose to magnitude 3.5 on Aug. 20, 1920. **Nova Pictoris 1925** was remarkable for the extreme slowness with which it went through its changes, and the many unusual phenomena which it exhibited. So far as can be ascertained, novæ are dwarfs before the outbreak; no fully satisfactory theory of the outburst has yet been proposed.

**Nebulæ.** The nebulae may be divided into *planetary* nebulae, whose spectra indicate them to be composed of luminous gases; *diffuse*, or *irregular*, nebulae, practically confined to the Milky Way and Magellanic Clouds, and lying in general at moderate distances; and *regularly-shaped* nebulae, which appear in all forms from circles or spheroids, through moderate ellipses and greatly flattened ellipses drawn out at the ends of their major axes, sometimes almost to sharp points, to the various forms of spirals. The planetary and the irregular nebulae are always associated with stars, usually with the very hottest stars. About half the diffuse nebulae show a gaseous spectrum; the remainder show a continuous spectrum crossed by dark lines, as if they were opaque and reflected the light of the neighboring stars.

Whenever the spectra of both nebula and associated stars can be obtained, they are found to be identical; furthermore, if the stars are of the hottest types, the nebula shows a gaseous spectrum, but if the stars are of a cooler type a continuous spectrum with dark lines is exhibited by the nebula. Quantitative luminosity measurements by Hubble have shown that the light sent out from nebulae is derived from associated stars: Some nebulae merely reflect the light of nearby stars, while others are stimulated

to self-luminosity in much the same way that comets are caused to glow when they approach the sun. Nebulosity not lighted up by stars remains invisible or else appears as a dark marking on the sky; there are many large tracts of obscuring matter in some regions, particularly in the Milky Way—great dark nebulae, clouds of exceedingly minute dust particles—which cut off the stars behind; probably no hard and fast division exists between dark or faintly luminous nebulae and bright irregular gaseous nebulae; in fact, in some cases we can trace one grading into the other.

An atom, upon acquiring an excess of energy through absorption of radiation, such as takes place in the nebulae, sometimes goes into a so-called "metastable" state, a condition in which it retains the excess for a much longer time than usual before radiating. This state may be terminated, and the energy given up, by collision with another atom instead of by radiation; under terrestrial laboratory conditions, collision usually takes place before the atom has had a chance to radiate, but in the nebulae, where the stimulating radiation is very weak, the density extremely low, and collisions relatively infrequent, such an atom may be expected to return to its normal state by emitting radiation. The spectral lines which would thus be produced may be predicted from modern spectroscopic theories, even though they may never have been observed in the laboratory; and, in this way, I. S. Bowen in 1927 showed that nearly all the previous unidentified lines in nebular spectra are due to metastable atoms of ionized oxygen and nitrogen, thus solving a problem which has perplexed astrophysicists for over half a century.

The hotter of the nuclear stars which stimulate the planetaries to shine are estimated, from the intensities of the lines in the nebular spectra, to have a temperature of 100,000°. So excessively hot a star gives out a large amount of radiation of such short wave-length that it highly ionizes the nearby atoms; electrons are ejected with high speed, and by "inelastic collisions" with other atoms impart just enough energy to the latter to put them into the metastable condition and cause them to radiate the characteristic nebular lines. Thus, the short-wave radiation from the star is transformed into the energy of motion of electrons and thence into the nebular radiation. Longer wave-length radiation from the star penetrates farther into the nebula before being depleted, but does not ionize the atoms so highly, so that the planetaries consist of a series of concentric shells in which the ionization is greater the nearer the central star is approached; this explains the relative sizes and intensities of the images of planetaries given by a slitless spectroscope—the exciting power of the star decreases outward, and the order of size of the images is exactly that of the ease of excitation of the wave-length of the light emitted by each. A similar process takes place in the diffuse nebulae which are excited to self-luminosity. Here also the lines requiring high energy for their excitation are strongest in the central regions, fading out near the borders before the more easily excited lines do.

The curious phenomenon of stationary calcium lines in the spectra of many spectroscopic binaries and hot, early type stars has revealed the existence in interstellar space of diffused absorbing clouds of quiescent calcium vapor, at rest relative to the stars.

**Structure of the Universe.** The exceptional progress made in recent years in the accumulation and analysis of extensive statistical data concerning the objects composing the sidereal universe has led to considerable revision of older views on the size and arrangement of the galactic system. Counts of the stars of different magnitudes in representative regions of the sky have shown that we live in a finite universe, containing about thirty billion suns, of which one billion are within the reach of modern instruments. The ratios of the number of stars of each magnitude to that of the next magnitude show that the stars thin out quite perceptibly within distances reached by telescopes of moderate size. It is generally agreed that the galactic system is a disk-shaped organization of stars, of planetary, diffuse, and dark nebulae, and of loosely-organized open star clusters of great variety; all these objects concentrate, as we see them, along the region of the Milky Way, which is almost entirely a mere depth effect. The globular clusters, though not in the Milky Way, also are affiliated with the galactic system; while the spiral nebulae, which avoid the Milky Way, are galactic systems external to our own.

After the vast gap beyond the confines of the solar system, lies a steady succession of stars, nebulae, clusters, and star-clouds, until finally we reach the globular cluster N. G. C. 7006, which Shapley finds, from the Cepheid variables which it contains, to be 200,000 light-years distant and hundreds of light-years in diameter. An extensive study of all known globular clusters, carried out by Shapley with the aid of the period-luminosity relation for the Cepheids, the characteristics of the B-type stars, etc., from which the distribution of the clusters in space has been determined, has shown that a third of the known clusters are more than 100,000 light-years distant, and that the star-clouds of the galaxy extend at least as far as the furthest clusters. Shapley concludes that the diameter of the galactic system is of the order of 300,000 light-years. In the system as outlined by the globular clusters, the galactic plane is still a plane of symmetry and flattening, though the clusters extend to great distances both above and below this plane. The system is elongated in plan, and the sun is near one end of it, so that practically all the clusters are located in one celestial hemisphere.

In the distribution of stars over the sky, as ascertained by statistical studies of star counts in selected regions, there exist in different galactic longitudes, at each galactic latitude (after allowance is made for stars blotted out by the obscuring clouds of dust and nebulosity in the great rift of the Milky Way) systematic departures in the number of stars per unit area from the *average* for that latitude, of such a nature as to indicate that the solar system is at some distance from the centre of the galaxy though almost exactly in its central plane. The centre of the galaxy is found to lie in the direction of Sagittarius (where five times as many stars are visible as in the opposite directions) but this centre itself, probably distant about 65,000 light-years, is concealed behind the impenetrable cosmic clouds of the Milky Way.

Furthermore, the brighter stars are not distributed over the sky in exactly the same manner as the fainter ones; and a study of the differences shows that, within the larger stellar system or galaxy, there must be immersed a secondary local aggregation, of many million stars,

to which our sun belongs. This local cluster, the nucleus of which is composed of the bright, hot, and massive helium stars, comprises nearly all stars brighter than the sixth magnitude. Its diameter is about 20,000 light-years, and its influence extends to stars of the sixteenth magnitude; probably three-fourths of all the stars in the immediate neighborhood of the sun are members. The sun is 300 light-years from the centre of the local cluster, and 150 light-years outside its central plane; this central plane is inclined twelve degrees to that of the galaxy, and the cluster itself is a little south of the galactic plane. This local cluster is probably enveloped in an absorbing nebulous cloud, since King has found that, on the average, stars up to about 100 light-years distant are more reddish the farther away they are; the absorbing medium must fall off rapidly beyond, however, for there is no further increase in redness with distance, and, in fact, color-indices (photographic minus photovisual magnitudes) from  $-0.5$  to  $1.9$  occur among the cluster stars just as among the nearer stars. The general absorption of light in space is negligible.

To a first approximation, the stars appear to move at random in space, in all directions and at speeds from zero up to 400 km/sec. However, several groups of stars with equal and parallel motions are known, forming moving clusters which appear to be independent subsidiary systems. In addition to cluster motions, there is also a general preferential motion of the stars in two opposite directions in the galactic plane, with a relative speed of about 40 km/sec; this was explained by Kapteyn on the hypothesis of two great interpenetrating streams, *within* each of which the stellar motions were at random. Finally, Strömberg has discovered that each of the various homogeneous groups into which the heavenly bodies may be classified—such as giant and dwarf stars of each spectral type, globular clusters, spiral nebulae, et al.—is moving as a whole, like a great swarm, along nearly the same direction in space, viz., in the plane of the Milky Way and toward Sagittarius; the velocities of the groups along this celestial highway vary from 12 km/sec for the long-period Cepheids to 300 km/sec for clusters and nebulae; within the groups the individuals are flying about in all directions, with velocities that increase regularly with increase of group speed. Strömberg's discovery is explained better by Schwarzschild's "ellipsoidal hypothesis," proposed in 1908 as an alternative to Kapteyn's two-stream theory. According to the investigations of Lindblad and others, the motions of the stars indicate that the galaxy consists of a number of subsystems, each in approximately dynamical equilibrium, rotating with different speeds about a common axis perpendicular to the galactic plane.

**Island Universes.** Our own stellar system, or galaxy, has been found to be not alone in space; beyond its confines, even as outlined by the globular clusters, lie millions of other galaxies, many of them comparable with our own universe. With the 100-inch reflector at Mount Wilson, Hubble has succeeded in resolving the outer parts of some of the spiral nebulae into myriads of separate stars, among which a number of Cepheid variables have been found; and from the period-luminosity relation for Cepheids, the Andromeda nebula is found to be 900,000 light-years distant and 45,000 in diameter, while

Messier 33 is 850,000 light-years away. The distance of the cluster N. G. C. 6822 is 700,000 light-years. The Magellanic Clouds also are external galaxies.

The non-galactic nebulae fall into a regular sequence of forms, ranging from small compact globular nebulae, through flattened, expanded, elliptical forms, to closely-wound spirals, and finally widely open disc-shaped spirals; a statistical study of these nebulae shows them all to have roughly the same general order of absolute luminosity, with an average mass about 300,000,000 times that of the sun, and distributed fairly uniformly in space. From the mean absolute magnitude, which is about -15.0, and the apparent magnitudes, a rough estimate of the distances may be made; the faintest nebulae that can be detected with the 100-inch reflector probably lie at an average distance of about 150,000,000 light-years, and a sphere of this radius represents the region of space at present observable. Objects at such a distance are now being seen as they actually looked in past geological ages—events occurring in the heavens at the present moment, though traveling on their way to the earth with the speed of light, may not find man here to receive them when they arrive. With faster photographic plates and larger telescopes, it will be possible to push the boundaries of the observable region of space back several times further, and with improvements believed to be practicable (some of which were actually under way in 1929) to detect exceptionally brilliant nebulae at a distance of a thousand million light-years, with light that started on its way when the earth itself was young.

It is probable that our own galactic system resembles rather closely such highly resolved spiral nebulae as Messier 33, consisting of a central condensation, knots, scattered stars, and diffuse nebulosity, the whole being 200,000 to 300,000 light-years in diameter. The local cluster forms an exceptionally large and dense outlying spheroidal aggregation or knot in one of the arms.

**Cosmogony.** Jeans has shown that the nebular hypothesis, with some modifications and reservations, may be made to explain nearly everything except that which it was specifically invented to explain, viz., the solar system. The heavens have indeed been searched in vain for objects showing the rings required by the Laplace-Roche theory or the evolution of a rotating incompressible fluid mass; but numerous nebulae show the flattened and lenticular forms indicated for the early stages by this theory; others show lenticular centres with definite indications of detached matter around an equatorial sharp edge, but this detached matter is in the form of spiral arms. Spectroscopic examination of the regular nebulae shows in every case a rotation with a high velocity about an axis which appears in the sky as the shortest diameter of the nebula. Now Jeans has proved that the classic "figures of equilibrium" will not be materially different for even highly compressible gases in the case of slow rotation; but as the rate of rotation increases through shrinkage, a compressible mass will finally, if the central density exceeds three times the mean density, take on the shape of a bi-convex lens, with a sharp equatorial edge. Further adjustment of equilibrium to increasing rate of rotation is no longer possible by mere change of shape; addi-

tional shrinkage involves an actual break-up of the nebula, the excess of the angular momentum beyond that which can be carried by the shrunken mass being thrown off into space by the ejection of matter from the equatorial sharp edge. Since the nebula is not alone in the universe, the equatorial edge will be deformed from a perfectly circular shape through the attraction of other bodies, and this deformation, however slight, will cause the ejected gas to stream out from two antipodal points on the equator, into spiral arms. This causes the dark equatorial band observed in nebulae which are viewed edge on. The ejected matter comes in time to dwarf the central nucleus in size, until finally there is little nucleus left.

The gigantic scale on which ejection takes place is such that gravitative attraction overcomes the expansive influence of gas pressure and is able to hold the jet together as a compact stream; but the issuing filament will break up into separate aggregations, which give rise to the lumpy appearance of the arms of spirals. In many nebulae, the observed knots in the arms take the form of pronounced condensations, and in the outer regions of some nebulae these condensations have further developed into stars. The family of stars thus born out of a single nebula may be millions in number; they may either mingle with the general mass of the stars, giving rise to a cluster such as the Great Bear group, or, if the original nebula was sufficiently remote from the main universe, they may form a separate colony, such as the Hercules cluster. These alternatives perhaps represent the two extremes of a continuous chain of possibilities. Quite possibly the main mass of the stars may be a collection of clusters, each originated out of a single nebula, now so intermingled that it is difficult for an observer to detect the separate groups.

The above evolutionary process is essentially, at least in its early stages, that imagined by Laplace, except that it is on an incomparably grander scale. Each of the condensations, however, as it starts off into space, is a gaseous nebula about the size and mass postulated by Laplace; but dynamic theory proves that on account of the difference in scale, matter ejected from such a nebula could not condense into filaments, still less into detached masses, but would merely constitute a diffuse atmosphere about the parent mass. As the latter shrunk by radiation, the constancy of angular momentum would, *until it had shrunk to a certain critical density*, merely demand that more and more gas should be transferred to this atmosphere. A cataclysmic period would then ensue, from which the mass would emerge as a binary star with the two components almost in contact. As development went on, the two components would move apart, the orbits become more eccentric, the components themselves might repeat the process of fission, and so on. The distance which any particular system would go along this course would depend in effect on the amount of rotation with which it was originally endowed. Both theory and observation agree that not many systems stay out the whole course; probably only half the stars in the sky are binaries, and only a tenth this number are multiple systems.

Nowhere in this scheme is there a place for anything in the least degree resembling our solar system. However, it is to be expected that off the normal course of evolution would exist

branch lines to which a few systems would be turned by some exceptional circumstance, such, for instance, as the close approach of two stars; and practically all contemporary hypotheses agree in ascribing the solar system to the tidal disruption resulting from such a dynamic encounter. The principal theories of this type are the planetesimal hypothesis of Chamberlin and Moulton, and the tidal theory of Jeans and Jeffreys; they differ considerably with respect to the development of the system after the encounter took place. Darwin's well-known tidal theory of the earth-moon system has received further confirmation in the recent work of Jeffreys.

**Celestial Mechanics.** E. W. Brown's *Lunar Theory*, developed according to the methods of G. W. Hill, was completed by the publication of the lunar tables in 1920. No terms of appreciable significance have been omitted, yet the moon still deviates unmistakably from its predicted position. The *irregular* deviations are at least partly due to irregular variations in the rate of rotation of the earth, which, in turn, must apparently be brought about by slight changes in the radius of the earth, the cause of which is not certain. The *secular acceleration* is undoubtedly due to the effects of tidal friction, which causes a direct acceleration of the moon's orbital motion, as well as a spurious acceleration due to increase in the length of the day; the researches of Fotheringham have shown that the solar and lunar accelerations can be accounted for by a slowing down of the rate of rotation of the earth by  $1/800$  second per century, and Jeffreys and Taylor have shown that tidal friction in shallow seas is fully capable of doing this. Finally, there is a *long period term* in the mean longitude of the moon the cause of which is unknown.

**Miscellaneous.** The 100-inch Hooker reflector was put into regular operation at Mount Wilson in 1919; the Dominion Observatory at Victoria, B. C., with a 72-inch reflector, was opened in 1918. In 1929 the construction of a 200-inch reflector with mirror of fused quartz was being planned by the California Institute of Technology.

Turkey adopted the Gregorian calendar in 1916; Russia, in 1918; Rumania, in 1919; Greece and all adherents of the Eastern Orthodox Churches, in 1923. The Julian Calendar is now followed only by the Ruthenian Catholics or Uniates of the Russian Ukraine. The use of the astronomical day was abandoned in 1925.

A new unit of distance, the *parsec*, has come into extensive use among astronomers; this is the distance at which a star would have a parallax of one second of arc, and is equal to 3.26 light-years.

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**ASTROPHYSICS.** See ASTRONOMY; PHYSICS.

**ATAVISM.** See HEREDITY.

**ATHEARN, WALTER SCOTT** (1872- ). An American author and professor of religious education. He was born at Marengo, Iowa, and was educated at Drake University, the State University of Iowa and the University of Chicago. He began his career as a public-school principal in Iowa, and after holding an associate professorship of pedagogy at Drake University (1900-04), the deanship of Highland Park Normal College (1906-09) and the professorship of religious education at Drake (1909-16), he became professor of religious education at Boston University in 1916 and in 1919 director of the School of Religious Education and Social Service. He lectured at Columbia University in summer, 1913-17. He has written numerous books on religious education, including *Religious Education and American Democracy* (1917), *A National System of Education* (1920); *Ten Lessons on the Organization of the Modern Sunday School* (1921); *An Introduction to the Study of the Mind* (1921), and *Character Building in a Democracy* (1924). He was the editor or joint editor of *The Religious Education of Protestants in an American Commonwealth* (1923); *Measurements and Standards in Religious Education* (1924); *Religious Education Survey Schedules* (1924); *The Master Library* (ten volumes) (1924), besides brochures on similar subjects.

**ATHERTON, GERTRUDE FRANKLIN (HORN)** (1857- ). An American novelist, born in San Francisco, Calif., (see VOL. II). Mrs. Atherton has continued her prolific authorship with her characteristic verve. She published *Perch of the Devil* (1914); *California—an Intimate History* (1914); *Before the Gringo Came* (1915); *Mrs. Balfame* (1916); *The Living Present* (1917); *The White Morning* (1918); *The Avalanche* (1919); *Sisters-in-Law* (1921); *Sleeping Fires* (1922); *Black Owen* (1923); *The Crystal Cup* (1925); *The Immortal Marriage* (1927), and *The Jealous Gods* (1928).

**ATHLETICS.** The term "athletics" embraces all games and sports of athletes and any adequate treatment of this subject can only be attained by individual articles on the various games and sports. The reader is therefore referred to such titles as BASEBALL, FOOTBALL, GOLF, TENNIS, etc. A brief survey of the subject of athletics as a whole appears to prove conclusively that each succeeding generation evinces greater enthusiasm for sports, both as health building in themselves and as a source of recreation. Two noticeable trends in sports history since the World War deserve passing comment; first, the ever-growing popularity of international competitions and, second, the amazing increase in interest shown in athletics by women, not only as spectators but as participants. Women now stage their own national meets in many branches of sports and each year sees a larger number of international contests for women being held.

Accompanying this growing devotion to sports is found naturally enough an astounding increase in skill and proficiency. Each year finds new record-breaking performances listed with track athletics and swimming leading the way. In such sports as golf and tennis, the advance is signaled by much higher adeptness displayed by the average participant. See OLYMPIC GAMES.

**ATHLETICS, TRACK and FIELD.** The revival of the Olympic Games undoubtedly was responsible in large measure for the progress made by practically every country in track and field athletics during recent years. No other branch of sports approaches this one both as regards world-wide popularity and record-breaking achievements. So numerous are the new standards established on the running track and in field events, that it is only possible to point out here the more important contributions to the records. It might be noted generally, however, that United States athletes have set the pace in field events, in relay racing, and in the short-distance running competitions. The Finnish and British athletes have excelled in practically all the long-distance running events.

The outstanding short-distance runners, as judged by record-breaking performances, are Charles W. Paddock, U. S., Chester Bowman, U. S., C. A. Bracey, U. S., and Percy Williams, Canada. The quarter-mile record holder is still James E. Meredith, U. S., who set the record of 47.4 seconds back in 1916. The other leaders and their specialties are D. G. A. Lowe, Great Britain, 600 yards; Dr. Otto Peltzer, Germany, 880 yards; Lawrence Brown, U. S., 1000 yards; Paavo Nurmi, Finland, 1 mile, 3 miles, 4 miles, 5 miles; Edwin Wide, Sweden, 2 miles; Alfred E. Shrubbs, Great Britain, 6 miles, 7 miles, 8 miles, 9 miles, 10 miles; F. Appleby, Great Britain, 15 miles; H. Green, Great Britain, 25 miles. For the metrical distances approximating the foregoing, practically the same list of stars is found.

In walking competitions, Canada and Great Britain were supreme with such notable "pedestrians" as G. H. Goulding, Canada, and G. E. Larner and H. V. L. Ross, Great Britain. In jumping events, the United States shows the way with H. M. Osborn (running high), Edward Hamm (running broad) and Sabin Carr (pole vault). John Kuck, U. S., is the leading shot putter and Eric Krenz, U. S., excels with the discus. The javelin honors go to E. Penttila,

Finland. Leading hurdlers are E. J. Thomson, Canada, G. C. Weightman-Smith, South Africa, and C. R. Brookings, John A. Gibson, and F. Morgan Taylor, all of the United States. Relay racing finds the United States on top, while the outstanding all-round athlete appears in Paavo Yrjola, of Finland, decathlon winner at the 1928 Olympic Games.

The Federation Sportive Feminine Internationale in 1928 passed upon the records established by European women athletes in recent years. Several United States standards which excelled those accepted were submitted to the Federation but were not recognized as they were not on the official forms of the Federation. Among the women athletes in the top rank may be mentioned Miss Mejzlikova, 11, of Czechoslovakia, and Miss Elsie Robinson, of the United States, in the sprints; Miss Ethel Catherwood, of Canada, and Catherine Maguire, of the United States, in the high jump, and Miss Lillian Copeland, of the United States, in the weight events. In comparison with the records established by men, it is found that the women so far have made their best showing in sprint races and jumping. As an indication of the wide appeal women's athletics are making it may be noted that a Japanese girl, Kinuue Hitomi, claimed the world broad jump record of 5.98 meters.

Perhaps the most significant feature in connection with the universal popularity of track and field sports is the increasing number of international competitions arranged each succeeding year. Some leaders of world thought profess to see in this development a future guarantee against wars. See OLYMPIC GAMES.

**ATHOLL, DUCHESS OF.** (KATHARINE MARJORIE) (1874- ). An English member of Parliament, born the daughter of Sir James Henry Ramsay, of Perthshire, Scotland, and married to the eighth Duke of Atholl in 1899. She attended the Wimbledon High School, and the Royal College of Music, and, specializing in piano, she became an associate of the latter institution. After her marriage she identified herself with nursing and other public activities. She was elected a Unionist member of Parliament in 1923, and was returned in each succeeding election through that of May, 1929. After November, 1924, she served on the Board of Education, as parliamentary secretary. Honorary D.C.L. degree was conferred on her by both Oxford and McGill universities, and honorary LL.D. degree by the universities of Manchester and Glasgow. She is a Dame Commander of the Order of the British Empire, and is the author of several books of verse.

**ATLANTA.** The capital of Georgia, U. S. A., and one of the most important trade centres of the South. The population rose from 154,839 in 1910 to 203,550 in 1920, and to 255,100 in 1928, by estimate of the Bureau of the Census. The population of greater Atlanta, according to local estimate, is 350,000. The area is 34.79 square miles. In 1929 greater Atlanta was created by the Legislature adding the municipalities of Avondale, College Point, Decatur, East Point and Hapeville. The residential section was razed by fire in 1917 with a loss of \$5,000,000. Building operations increased from \$3,685,663 in 1916 to \$20,584,734 in 1922 and to \$27,094,912 in 1923, while real estate values rose 35 per cent between 1918 and 1923. In 1927 the value of 4454 building permits issued was \$12,081,122. Atlanta has more than 40 prominent office build-



ings. A zoning ordinance, with racial segregation districts, was adopted in 1923. In 1927 the State Supreme Court in two successive actions declared void the portion of this regulation which forbade the building of shops in residential areas.

Two universities have been opened. Emory University of the Methodist Episcopal Church, South, was moved to Atlanta in 1914; and Oglethorpe University, which was closed shortly after the Civil War, was reopened in 1916. A hospital conducted by the medical school of Emory University was completed in 1924 at a cost of \$2,000,000. Three large hotels, costing \$6,500,000, \$1,250,000, and \$1,000,000, also were erected. A county court house, recently erected, cost \$1,200,000, and the city is building a new City Hall at a cost of \$1,278,000. In the newly founded High Museum of Art is being collected a representative group of paintings and sculpture. The construction of a number of viaducts to eliminate grade crossings within the city has been carried out. More than \$6,000,000 has been spent for the reconstruction and extension of the sewer system, \$2,850,000 for improvements in the department of waterworks, and \$400,000 for a centrally located public market. The amount spent yearly for new school buildings and equipment has been approximately \$5,500,000 for the past five years. Candler Field, Atlanta's municipal airport, consisting of 297 acres, is a terminus for four air routes: New York; Jacksonville-Miami; Birmingham-New Orleans; Chattanooga-Nashville-Chicago.

According to the U. S. Census of Manufactures, more than 1500 different commodities are manufactured within the metropolitan area of Atlanta. The value of these products increased from \$79,815,237 in 1921 to \$131,236,952 in 1925. The number of wage earners also increased from 12,660 in 1921 to 18,208 in 1925 and were paid \$17,643,000 in wages. Within the metropolitan area of Atlanta are 20 banks and trust companies with a total capital of \$14,237,700. The Federal Reserve Bank of the Sixth district is located in Atlanta. The assessed valuation of property in Atlanta in 1927 was \$382,499,000; the net debt was \$12,199,000. The colossal memorial to the Confederacy, which is being carved on the face of Stone Mountain, a great monolith of smooth, solid granite near Atlanta, was begun by Gutzon Borglum and is being continued by Augustus Lukeman. The figure of General Lee in the central group was unveiled on Apr. 9, 1928. Other figures in this group are Jefferson Davis, "Stonewall" Jackson, and four outstanding Confederate generals selected by the State historians of the Southern States. The plans contemplate ultimately a cavalry group, an infantry group, and an artillery group, with a central group.

**ATMOSPHERE.** See METEOROLOGY.

**ATOMIC NUMBER.** See CHEMISTRY.

**ATOMS, ATOMIC THEORY.** See CHEMISTRY; PHYSICS.

**ATONALISM.** See MUSIC.

**ATTENTION.** The development of the psychology of attention since 1914 has shown the two-fold nature of the problem. On the one hand attention can be expressed in terms of physical conditions, the conditions which attract or distract attention, and on the other hand it can be assimilated to subjective interest with peculiar laws of its own. The experiments of Dallenbach and Bowman sought to measure the importance of size, form, and intensity of stim-

ulus as determinants of attention, but these relationships seem to be largely empirical and do not obey any comprehensive law. They also indicated that attention varies with the different modalities of sensation, attention to touch being highest, with sound and light following in the order named. Liddell (*American Journal of Psychology*, 1920, vol. xxx, p. 241) sought to verify the theory that attention waves in vision are due, on the one hand, to the adaptation of the part of the retina stimulated and, on the other, to eye movements. By using the Dodge apparatus, he photographed the eye movements simultaneously with the disappearances and appearances of minimal light. The result showed no correlation between the movements and the fluctuations of attention. The waves appeared to continue while the eyes were stationary, while movements neither brought back the light during periods of no sensation nor prevented its disappearance during the periods of visibility.

In France and Italy, attention was studied from the point of view of subjective interest. Professor Janet (*Journal de Psychologie*, 1921, vol. xviii, p. 140) on the basis of his observations of neurasthenics brought out the intimate relation between the oscillations of nervous tension and the emotional condition of the subject. Rignano also championed an affective theory of attention. A review of recent literature on attention will be found in *Psychological Bulletin*, 1926, p. 1. See ACTION; PERCEPTION.

**ATTERBERG, KURT** (1887- ). A Swedish composer, born at Göteborg, Dec. 12, 1887. After graduation as a civil engineer, in 1910, he studied composition in Stockholm with A. Hallen for one year, when he won the state stipend enabling him to continue his studies at the Hochschule in Berlin and with Schillings at Stuttgart, in conducting. He conducted symphony concerts in Stockholm, Göteborg, and Malmö, and in 1920 made a very successful tour of Germany as conductor of his own works. His compositions, avoiding all modernistic extravagances, have placed him in the front rank of Swedish composers. He has written a concert overture in A minor, a violin concerto, a cello concerto, *Vastkustbilder* and *Rhapsody* for orchestra, a symphonic poem for baritone and orchestra, *Requiem*, incidental music to Didering's *Jefta*, a pantomime-ballet (*Der Svinaherde*), two operas, *Hervarir* and *Harner* (Stockholm, 1921, and *Bäckahästen* [*The River Horse*] (Stockholm, 1925) and six symphonies, of which the sixth, in C, won the \$10,000 prize offered by the Columbia Phonograph Company in commemoration of the Schubert Centennial (1928).

**ATTERBURY, GROSVENOR** (1869- ). An American architect, born in Detroit. He graduated from Yale in 1891 and studied architecture at Columbia University and in Paris. He made a special study of town planning, industrial housing, model tenants, and hospitals. His best-known work was done in connection with the development of the Forest Hills Gardens in Long Island, founded by the Russell Sage Foundation. He also planned several industrial communities. He was architect for the restoration of the New York City Hall and for other important buildings in New York, Philadelphia, Baltimore, and other cities. He was chairman and director of the war industry housing commission of the National Housing Association during the World War. He served with the

Army Educational Commission in France and was supervising architect of the A. E. F. University at Beaune, France. He was elected an associate member of the National Academy of Design, a fellow of the American Institute of Architects, president of the Architectural League of New York, and was appointed a member of the New York State Tenement House Commission.

**ATTERBURY, WILLIAM WALLACE** (1866- ). An American railway official, born at New Albany, Ind. (see VOL. II). In May, 1912, he was promoted from the position of fourth vice president of the Pennsylvania Railroad to that of vice president in charge of operation. He received a leave of absence from the system in 1917, to direct the construction and operation of the military railroads in France for the American forces, becoming director general of transportation. He received the rank of brigadier general, and his services, which were deemed invaluable, were rewarded by American, French, British, and Belgian distinctions. He remained in the military service until 1919, returning then to the Pennsylvania Railroad and becoming again, in 1920, vice president in charge of operation. In 1924 he was advanced to vice president (without designation), and on Oct. 1, 1925, became president in succession to Samuel Rea, retired. After his retirement from military service, he devoted much time to the study of foreign railroad systems. General Atterbury received the honorary degree of M.A. from Yale University in 1911, and that of LL.D. from the University of Pennsylvania in 1919.

**ATTERIDGE, HAROLD RICHARD** (1886- ). An American playwright and librettist. He was born at Lake Forest, Ill., and educated at the University of Chicago. He wrote, mainly in collaboration with others, many popular musical comedies, and a series of reviews, *The Passing Show* (1912-19, 1921-23, 1925). Among his numerous works are *Broadway to Paris*; *The Honeymoon Express*; *Robinson Crusoe, Jr.*; *Monte Cristo, Jr.*; *The Rose of Stamboul*; *Make It Snappy*; *The Dancing Girl*; *The Dream Girl*; *Sky High*; and *The Princess Flavia*.

**ATTRIBUTE**. In psychology, a unit of experience supplanting an earlier unit sensation. The impossibility of producing in the laboratory a pure sensation and the necessity of introspecting only on the attributes of sensational experience, such as quality, duration, intensity, etc., led to a revision of terminology. Psychological experience is regarded by the Titchener school as a process of which we are able to observe only the changing attributes. See **PSYCHOLOGY**.

**ATWOOD, ALBERT WILLIAM** (1879- ). An American writer and lecturer on financial topics, born at Jersey City, N. J., and graduated at Amherst College, 1903. He was a reporter for the *New York Sun* (1903-06) and financial editor of the *New York Press* (1906-12) and from 1915 to 1922 a member of the faculty of the School of Journalism of Columbia University. He lectured at New York University, 1908-15. He contributed financial articles regularly to a number of magazines. He was the joint author with Thomas Conway, Jr., of *Investment and Speculation* (1911); and wrote *How to Get Ahead* (1917); *The Exchange and Speculation* (1917); *Putnam's Investment Handbook* (1919); *An Elusive Panacea* (1924), and *The Mind of the Millionaire* (1926).

**ATWOOD, WALLACE WALTER** (1872- ).

An American geographer and geologist, born at Chicago, Ill. He was graduated in 1897 at the University of Chicago. He was an assistant geologist with State surveys in New Jersey and Wisconsin, 1897-1899, and taught at the Lewis Institute, Chicago, (1897-99) and the Chicago Institute (1899-1901). After holding minor positions at the University of Chicago, in 1910 he became associate professor of physiography and general geology. In 1913 he was called to the chair of physiography at Harvard University, and remained there until 1920, when he accepted the presidency of Clark University with the chair of physical geography. In 1901 he became connected with the United States Geological Survey and in 1906 with the Illinois Geological Survey. His many researches have included studies of the physical geography of the Devil's Lake Region and of the Evanston-Waukegan region of Illinois, the glaciation of the Rocky Mountain region, and the economic geology of Alaska, especially the coal resources. Among his more recent works are *New Geography, Book II* (1920), and numerous papers on scientific and educational subjects. In 1925 he founded and became editor of *Economic Geography*.

**AUDITION**. Among significant recent developments in the psychology of audition was a new theory of audition by Sir Thomas Wrightson published in his *Inquiry into the Analytical Mechanism of the Internal Ear* (1918). On the basis of new histological researches, he argued against the tenability of Helmholtz's resonance theory and advocated the substitution of a pressure-balance theory of hearing. The Wrightson theory has been severely attacked by the late E. B. Titchener and E. G. Boring, who contended that it offered no advantage over the generally accepted, but not entirely adequate Helmholtz theory. In a later discussion, Boring expressed his preference for a non-resonance theory of hearing (*American Journal of Psychology*, 1926; see also criticism by H. Banister, same journal, 1927). Much experimentation and discussion were devoted to the determination of the attributes of sound. Watt in his *Psychology of Sound* (1917) pleaded for a uniformity of attributes in all sense modalities. He accounted for pitch by the attribute of order and regarded volume as extensity. He brought forward a theory of auditory space paralleling the space of vision. R. M. Ogden (*Hearing*, 1924), discussing the work of Koehler and Revesez, would have psychologists accept the attributes of pitch, volume, intensity, duration, and, probably, brightness. On the other hand, Rich's experiments (*American Journal of Psychology*, 1919, vol. xxx, p. 121) seemed to point to the identity of pitch and brightness, but to make tonality a separate attribute. The existence of an after-image in audition analogous to the after-image of vision was called into question by H. G. Bishop (*American Journal of Psychology*, 1921, vol. xxxii, p. 305). Tones, he found, have a characteristic modified ending which depends for its intensity upon the intensity of stimulus and for its insistence upon intensity and duration of stimulation. Localization, investigated by H. M. Halverson (*American Journal of Psychology*, 1923, vol. xxxiv, p. 178), is found to be dependent both on difference of phase and on intensity, with the phase relation more important. A review of the recent literature of facts and theories of audition will be

found in the *Psychological Bulletin*, 1928. See *PSYCHOLOGY, EXPERIMENTAL*.

**AUER, JOHN** (1875- ). An American physiologist and pharmacologist, born at Rochester, N. Y. He graduated from the University of Michigan in 1898 and four years later received his degree of doctor of medicine from Johns Hopkins. He was a medical house officer, Johns Hopkins Hospital (1902-03), instructor in physiology at the Harvard University Medical School (1906-07) associate at the Rockefeller Institute (1907) and during the period 1908-21 an associate member of the Rockefeller Institute. In 1921 he became professor of pharmacology and director of the department in the school of medicine of St. Louis University, and in 1924 pharmacologist of St. Mary's group of hospitals, St. Louis, Mo. Dr. Auer's numerous scientific societies include the American Society for Pharmacology and Experimental Therapeutics (secretary, 1912-16, president after 1924). He has contributed to scientific literature the results of researches into digestion, respiration, heart action, the physiological action of drugs, and other subjects.

**AUER, LEOPOLD**. (1845- ). A Hungarian violinist and teacher (see VOL. II). On Mar. 23, 1918, he made his American debut in New York, where he settled permanently as a teacher. In the fall of 1919, he undertook the regular instruction of a master-class for two months, September and October, at the Chicago Musical College. Among his numerous pupils, the most famous are Heifetz, Elman, Zimbalist, Seidel, Kathleen Parlow, Isolde Menges, and Cecilia Hansen. The fundamental principles of his method were published by his pupil Maia Bang in her *Elementary Violin Method* (New York, 1920). He himself wrote a more extended treatise, *Violin Playing as I Teach It* (New York, 1921), and is the author of *My Long Life in Music* (1923).

**AUGSPURG, ANITA** (1857- ). An active worker and lecturer in the German women's movement and in municipal and communal reforms. She came from a long line of lawyer ancestors, residents of Bavaria, and after studying drama and appearing for a short time on the stage, took up law and practiced for some years in Munich. Later, she studied agriculture and managed her own large estate. More recently, with Lida Heymann, she edited the magazine, *Die Frau im Staat*.

**AULARD, O'LÉR'**, (FRANÇOIS VICTOR) ALPHONSE (1840-1928). A French historian (see VOL. II), honorary professor of the French revolution at the Sorbonne until his death. His later scholarly researches on the French revolution include the *Recueil des actes du comité du salut public* (26 vols.); *Paris sous le premier Empire* (2 vols., 1912-14); *Lettres et bulletins de Barentin à Louis XVI, avril-juillet, 1789* (1915); *Dictionnaires des Conventionnels de Auguste Kusowski* (1916-19); *La révolution française et le régime féodal* (1919); *Histoire politique de la grande guerre*, with E. Bouvier (1924); the last and ninth volume of *Études et leçons sur la révolution française* (1924), and *Le christianisme et la révolution française* (1925, tr. 1927). After the Armistice, he threw his influence on the side of political liberalism. As representative of France to the League of Nations, and president of the International Federation of League of Nations Societies, which met in Berlin in 1927, he sought to bring about

a reconciliation between France and the new democratic Germany. He also tried to popularize the lessons of history in their bearing on the problem of war and peace in *La guerre actuelle commentée par l'histoire*, war articles (1916), and in two series of public courses at the Sorbonne: *La paix future d'après la révolution française et Kant* (1915), and *Le patriotisme française de la renaissance à la révolution* (1921).

**AULTMAN, DWIGHT EDWARD** (1872- ). An American army officer, born at Allegheny, Pa. He was graduated from the United States Military Academy in 1894 and was appointed second lieutenant of cavalry, but in the same year was transferred to the artillery. He saw field service in Cuba in 1898 and organized and commanded the Cuban artillery (1901-02). He held the rank of major when he was sent to Germany on a special mission in 1914. He was a student at the Army War College (1916) and an instructor there (1916-17). From October, 1917, to May, 1918, he commanded the Fifth Field Artillery, in the American Expeditionary Force. He was commissioned brigadier general in the National Army, Apr. 12, 1918. In July of that year, he received command of the 51st Brigade of Field Artillery, 26th Division, and in October he became chief of artillery of the 5th Corps. In December, 1918, General Aultman was made chief of artillery of the 2nd Army. In June, 1919, he was honorably discharged as brigadier general in the National Army, and in the same year was at the General Staff College. In July, 1920, he received a recess appointment as brigadier general in the regular service. A commission as brigadier general followed in 1921. For his war services he received the American Distinguished Service Medal and a War Department citation, as well as the French distinctions of a commandership in the Legion of Honor and the Croix de Guerre.

**AUMONIER, STACY** (1887-1928). An English author, who died at Clarens, Montreux. After working as a decorative designer, and landscape painter, and exhibiting in the Royal Academy, the Royal Institute, and the International Exhibition, he began delivering professional monologues in 1908. After 1913 he contributed short stories to numerous magazines in England and America, and also published several collections of stories, such as, *Three Bars' Interval*; *The Love-a-duck*; *Miss Bracegirdle and Others*; *Odd Fish*; *Overhead*; and *The Baby Grand* (1926). He also wrote the following novels: *Olga Bardel*; *Just Outside*; *The Querrills*; *One After Another*; and *Heartbeat* (1922).

**AURIC, GEORGES** (1899- ). A French modernistic composer, born at Lodève, Hérault. After studying at the Paris Conservatoire and under d'Indy at the Schola Cantorum, he began his career as a composer as one of the notorious group known as "Les Six" (Auric, Durey, Honegger, Milhaud, Poulenc, Taillefer). He wrote a comic opera, *La Reine de Cœur*; the ballets, *Les Noces de Gamache*, *Les Facheux*, *Les Pélicans*, *Les Matelots*, *La Pastorale*; *Nocturne* and *Suite* for orchestra, and piano pieces.

**AUSTIN, FREDERIC** (1872- ). A British dramatic baritone and composer, born in London. He received his first instruction on the piano from his mother and studied composition with his uncle, Dr. W. H. Hunt. He began his career in Liverpool as an organist, teaching also harmony at the College of Music there. While

holding these positions, he discovered that he had an exceptionally fine voice and studied under Charles Lunn. After a most successful début in London in 1902, he soon became one of the most popular soloists at the great English festivals, so that in 1906 he resigned his positions in Liverpool. He made his operatic début as Gunther in *Götterdämmerung* at Covent Garden, in 1908, during the season of Wagner performances under Hans Richter. In 1910 he sang principal parts at his Majesty's Theatre and Covent Garden and when Thomas Beecham, in 1915, formed his own opera company, he was engaged as principal baritone. He also was heard in Germany, Holland, and Denmark. In 1924 he was appointed artistic director of the British National Opera Company. He revised and completely reorchestrated Pepusch's *Beggar's Opera*, which, with Austin himself in the cast, had an unusual run in London (June, 1920-Dec. 1923). While this was still running, he made a similar revision of its sequel, *Polly*, which met with equal success. His original works include a symphonic poem, *Isabella*; a rhapsody, *Spring*; *Symphony in E*; incidental music to several plays; and songs and piano-pieces.

**AUSTIN, MARY HUNTER** (1868- ). An American author and playwright, born in Carlinville, Ill. (see VOL. II). Her recent works, characterized by breadth of sympathy, include *Love and the Soul-Maker* (1914); *The Man Jesus* (1915); *The Man Who Didn't Believe in Christmas*, a play, produced in New York (1916); *The Ford* (1917); *The Young Woman Citizen* (1918); *The Trail Book* (1918); *Outland* (1919); a chapter on "Aboriginal Literature" in *Cambridge History of American Literature* (1919); *26 Jayne Street* (1920); *The American Rhythm* (1923); *The Land of Journeys' Ending* (1924); *A Small Town Man* (revision of *The Man Jesus*, 1925); *Everyman's Genius* (1925); *Lands of the Sun* (revision of *California*, 1927); *The Children Sing in the Far West* (1928), and contributions to magazines.

**AUSTRAL, FLORENCE** (1894- ). An Australian dramatic soprano, born in Melbourne. Her real name was Wilson. Winning a scholarship, she entered the Melbourne Conservatory in 1914, studying piano and voice with Mme. Wiedermann. After further vocal study with Sibella in New York, she made her début with the National Opera Company in London as Brünnhilde in *Die Walküre* (May 16, 1922), creating a veritable furore. Within a year, she had won recognition as one of the greatest of living artists through her marvelous impersona-

scribed as sensational. Since then, her tours of the United States have been an uninterrupted succession of triumphs. In 1925 she married the flutist, John Amadio.

**AUSTRALIA.** A self-governing British dominion including the island continent with its dependencies. The six states, New South Wales, Victoria, Queensland, South Australia, Western Australia, and Tasmania, and the two territories, Northern Territory and Federal Territory, which make it up, comprise an area of 2,974,581 square miles and a population in 1928, exclusive of aborigines, of 6,262,720, composed of 3,204,559 males and 3,058,161 females. In 1911, the inhabitants numbered 4,455,105. Immigration has been slow, to the disadvantage of the development of the Commonwealth, which has unbounded natural resources and the ability to support a population as great as that of the United States. During 1911-21 the excess of immigrants over emigrants was only 166,977, as compared with 40,695 in 1911 alone. In 1921 net immigration was only 15,780. By 1928, however, the excess of immigrants over emigrants reached 27,232. The population is almost wholly of British origin (97 per cent), highly literate, and well-to-do. The country's development had taken an unfortunate turn in the concentration of population in the cities and with the increasing application to industrial activities, to the neglect of the agricultural. For the Commonwealth, 62 per cent of the population was urban in 1921; 42 per cent of the total population was gathered in the six capital cities alone, as against 38.05 per cent in 1911. The capital cities, with their metropolitan populations in 1927 (1911 population in parentheses), were Sydney, N. S. W., 1,070,510 (629,503); Melbourne, Vic., 1,000,000 (588,971); Brisbane, Qld., 274,260 (139,480); Adelaide, S. A., 316,865 (189,646); Perth, W. A., 184,223; Hobart, Tas., 55,130 (39,937). As a result, Australia's problems of health, education, and social relations are largely those of an industrial society, not those of an agrarian one.

**Agriculture.** Up to 1924, 42.06 per cent of the total acreage of the Commonwealth was still unoccupied or occupied by the Crown; only 5.95 per cent had been actually alienated; and 48.84 per cent was held under leases. Of the 113,229,446 acres alienated in the fiscal year 1925-26, 16,793,578 acres were under crops. This compares favorably with the crop acreage of 11,893,838 for 1910-11. The following table gives acreage and production of principal crops for 1912-13 and 1925-26.

Crop	Acreage 1912-13	Acreage 1925-26	Yield	
			1912-13	1925-26
Wheat	7,339,651	10,175,000	91,981,070 bu.	114,504,000 bu.
Oats	874,284	1,012,000	16,116,712 "	11,896,000 "
Corn	314,686	297,000	8,356,158 "	7,432,000 "
Hay	8,217,041	2,832,000	3,372,596 long tons	2,978,000 "
Sugar cane	155,587	193,000	1,195,141 "	3,966,000 "

tions of Aida, Elisabeth, Isolde, and Brünnhilde in both *Siegfried* and *Götterdämmerung*. At the same time, she won equal praise as a concert singer, appearing in symphony concerts under Weingartner, Wood, and Ronald and at some of the principal English festivals (Norwich, Worcester, Leeds). In 1924 she was chosen by the Victor Company to sing Brünnhilde for the series of records of the *Ring* dramas directed by Albert Coates. The success of her American début in Brahms's *German Requiem*, at the Cincinnati Music Festival (May 7, 1925), can only be de-

In 1926-27 there were 160,587,000 bushels of wheat produced and 109,000,000 bushels in 1927-28. In the latter year, the production of raw sugar was 506,000 long tons.

Pastoral activities remain highly important. The figures for live stock for 1913 and 1925 were: sheep, 85,057,402 and 103,563,218; cattle, 11,483,882 and 13,279,785; horses, 2,521,983 and 2,250,361; pigs, 800,505 and 1,128,374. The wool yield in 1912-13 was 648,851,913 lb.; in 1928-29, 815,000,000 lb.; butter, in 1912-13, 198,758,238 lb.; and in 1925-26, 273,313,685 lb.

It was not until 1922 that the wool industry showed an approximation to pre-war conditions. Heavy stocks had accumulated because of war conditions, a diminished world demand, and the fall in prices. Only in 1922, as a result of the heroic operation of the British-Australian Wool Realization Association, established in 1921, was the large supply disposed of. During the period 1914-24, an increasing interest was manifested in cotton culture. The Government offers bounties on rice, coffee, cigar tobacco leaf, fibres, oil, dried fruits, sugar, and combed wool for export.

**Minerals.** The total value of mineral production in all Australia in 1913 was £25,808,000; 1922, £20,316,000; 1923, £22,232,000; 1924, £24,646,000; 1925, £24,593,000; 1926, £23,951,201. The value of the more important minerals in 1926 was as follows: Gold, £2,203,839; silver and lead ores, £4,930,925; copper, £560,181; tin, £825,806; coal, £11,852,961. The total mineral production for the Commonwealth up to the end of 1925 was £1,105,355,631; of this amount, £621,534,933 was the value of gold.

**Manufacturing.** Here is to be seen the Commonwealth's greatest advance during recent years. From 1911 to 1926, the number of employees in Australian factories increased from 312,000 to 450,920, the amount of wages paid rose from \$118,200,000 to \$321,481,999, and the value of output advanced from \$518,700,000 to \$1,994,181,000. Foodstuffs, machinery, clothing, textiles, etc., are the leading industries. Imports of the following have declined because local manufacturers began to supply the domestic market: textiles and wearing apparel, confectionery, cement, toilet articles. There are government bounties for the manufacture of iron and steel and the production of shale oil. During 1926-27 £256,603 was paid under the Iron and Steel Products Bounty Act, for products manufactured from materials produced and manufactured in Australia.

**Commerce.** The adverse trade balance in 1927-28 was £6,521,391 as compared with £19,821,411 in 1926-27. Both exports and imports were lower in the former year than in the latter. The exports in 1927-28 were £141,595,159, as compared with £144,895,183 in 1926-27. Import figures for the same year were £148,116,550 and £164,716,594, respectively. The values of the principal imports in 1927-28 with the 1926-27 figures in parentheses were as follows: Cotton and linen piece goods, £8,594,086 (£10,128,947); electrical machinery, £7,133,556 (£7,435,467); other machinery, £9,080,826 (£9,214,719); motor chassis and parts, £7,136,921 (£12,764,559); gasoline, £6,194,842 (£6,703,670); and silk piece goods, £5,963,243 (£5,866,738). The most important exports in 1927-28 with 1926-27 figures in parentheses were: Wool, greasy, £59,767,745 (£53,411,147); wool, scoured, £6,811,818 (£5,820,500); wheat, £14,620,899 (£20,785,414); flour, £5,229,212 (£6,254,316); and butter, £6,903,918 (£5,465,347). Trade between the United States and Australia in 1927-28 was as follows: Exports from Australia to the United States, £9,113,353 (£18,502,834 in 1926-27); imports from the United States to Australia, £35,520,981 (£41,331,798 in 1926-27). Depressed conditions throughout the Commonwealth affected the trade between the two countries adversely.

In 1911, 4,993,220 tons entered, as compared with 5,558,875 tons in 1926-27; and 4,991,581

tons cleared Australian ports in 1911, as compared with 5,605,100 in 1926-27. On June 30, 1923, the Commonwealth possessed 49 steamships of 252,524 gross tons, valued at £14,156,938; the first purchase was made in 1916. In August, 1923, a Federal Shipping Board was created to take over management. By 1927, however, the Government virtually admitted its failure as a ship operator because, on June 1 of that year, it owned only seven vessels of 53,420 tons.

**Communications.** From the 17,842 miles of lines in the Commonwealth in 1912, of which 16,898 miles were government-owned, railways increased to 26,351 miles (25,379 miles government-owned) in 1926. The leading difficulty confronting the Commonwealth is the variety of gauges in use. It has been decided to adopt a single standard gauge of 4 feet 8½ inches, but the cost was so great that the work is being done piece-meal. Inasmuch as many of the railways were for developmental purposes, operating expenses continue to exceed revenues. A trans-continental railway from north to south, over 1000 miles in length, has been under construction. Something of the progress made in railway building may be ascertained from the activities of a single year, 1925-26, i.e., miles of railway under construction and authorized in the different states: Victoria, 54 and 144; New South Wales, 244 and 259; Queensland, 234 and 1165; South Australia, 20 and 46; Western Australia, 112 and 174. Suburban lines in the vicinity of Melbourne and Sydney have been electrified and, as the traffic develops on main country lines, it is intended to convert to electric traction busy sections which are within reasonable distance of a cheap power supply.

**Finance.** For 1911-12, revenues for the Commonwealth were £20,548,520, and expenditures £14,724,097. For 1921-22, these had reached £64,897,046 (revenues) and £77,930,426 (expenditures); and for 1927-28, revenues were £76,670,222 and expenditures £82,120,459. The debts of the Commonwealth and the states increased enormously because of the War. In 1914 the total debt of the Commonwealth and states was £337,000,000; by Dec. 31, 1927, the Commonwealth public debt was £479,658,216, and those of the states, £679,223,572. In fact, the total war expenditure for the seven years ending June 30, 1922, was £477,498,000, of which £135,340,000 was charged against revenues, while the remainder came from loans. Before the War (1906-13), the Commonwealth borrowed, for productive purposes, £3,401,237; during 1914-21, £12,656,407 was borrowed toward the same end. For the same periods, state borrowings totaled £88,471,724 and £146,295,100. The Commonwealth Bank, opened in 1913, had in 1926, £195,451,540 in deposits. On July 31, 1927, the Commonwealth had in circulation £48,393,000 in notes, against which the gold reserve was 45.60 per cent of the total.

**History.** The year of the War's outbreak saw the installation of a Labor government in Australia. Mr. Cook's ministry had worked under the handicap of a Labor majority in the Senate since 1913, with the result that the new problems of war and Labor's increasing independence forced the dissolution of Parliament. In the elections of September, 1914, Labor's victory was impressive, the poll showing 41 seats to 33 for the Liberals in the Lower House and 31 seats to 5 in the Upper. Mr. Fisher at first headed the cabinet but was succeeded in October,



1915, by W. M. Hughes, whose forceful personality dominated the affairs of the Commonwealth for the next seven years. Under him, Australia, once so indifferent to purposes of imperialism, became a veritable storm centre of imperial politics. In spite of his Labor antecedents, Mr. Hughes returned from a visit to England, in 1916, a "die-hard," advocating war to the finish, compulsory military service, imperial trade protection, and a closer imperial partnership. He felt that Australia's war spirit was languishing from its first fine outburst, which in September, 1914, had brought German New Guinea, German Samoa, and the Bismarck Archipelago into Australian hands within a month and had sent steady streams of soldiers to fight at Gallipoli, in France, and in Palestine. In June and July, 1916, voluntary enlistments fell to 6000 monthly. In order to get out the 300,000 troops he had promised London, Mr. Hughes decided to resort to a conscription referendum. Violent opposition developed, led by Mr. Hughes's own Labor Party, which expelled him from its ranks. After a bitter campaign, conscription was defeated by a vote of 1,146,000 to 1,085,000. Around these two elements, therefore, the subsequent political struggles were to gather. On one side was the increasing intransigency of Labor; on the other was the fixed determination of Mr. Hughes and the conscriptionists to see the War through to a successful conclusion. In February, 1917, Hughesites and Liberals constituted a coalition government under the name Nationalist Party, with Mr. Hughes as premier. In the general elections of May 5, 1917, the Nationalist Party was returned, but with reduced majorities. Labor was recalcitrant. Strikes, which had become frequent in 1916, took on a virulent form in 1917; many of them were protected.

Nothing showed this temper better than the decisiveness with which Mr. Hughes's second conscription referendum was defeated, in December, 1917. The adverse majority this time was almost 200,000. Thenceforth, Labor's tone was almost revolutionary. It issued a manifesto stigmatizing the war as of capitalist origin, and, in June, 1918, its annual convention demanded an immediate cessation of hostilities. In the same month, the important Australian Labor Conference met to congratulate Russia on the success of her revolution and to present a programme of peace terms as far-reaching as that of the British Labor Party. On this hostile note, the war ended.

For her size and resources, Australia's war effort was extraordinary. Recruiting brought 417,574 men under arms; of these, 329,682 saw overseas service. The small Australian fleet had been active, as witness the destruction of the *Emden* by the *Sydney*. Casualties showed 58,471 killed and died, 4264 prisoners, and 150,241 wounded. Various estimates have been made as to the total war cost, one authority placing it at £476,000,000. The country was organized for war service through measures which gave the central Government very wide powers, under which it fixed prices, pooled the country's leading products, declared a moratorium for debtors, legislated merely by gazetting a regulation, etc. Through its wheat pool, organized in 1915, it sold 500,000,000 bushels in the five seasons 1915-20, largely to Great Britain, and through its wool pool disposed of 2,280,000,000 pounds of wool in the four seasons 1916-20.

After the War, the latter pool, under another form, liquidated its carry-over stocks by 1922 so successfully that the growers received a profit. One result of these economic measures was a high degree of prosperity in the period 1916-20.

Following the War, Australia entered with vigor on reconstruction measures. Its attitude toward the returned soldiers was generous. Employment was found for 121,339 ex-service men up to April, 1922, and of these 22,444 were settled on land at a cost to the Commonwealth of £31,513,130. In addition, the Reparation Department provided pensions for 222,537 men, while £30,000,000 was distributed in gratuities. On May 9, 1921, Australia established its civil administration in the former German possessions of Kaiser Wilhelm's Land (German New Guinea), the Bismarck Archipelago, and the Solomon Islands, which had been assigned to Australia by the League of Nations under a Class C mandate dated Dec. 17, 1920. The mandate permitted the Commonwealth to extend its laws to the mandated territory but not to establish fortifications there. At the Peace Conference, the imperialism of Mr. Hughes, his objection to the Japanese racial-equality amendment to the League Covenant, and his firm stand toward Germany gave him, curiously enough, an imperial popularity and reputation at the same time that his position at home steadily weakened. Australians were markedly turning toward local affairs from the larger world issues. In post-war politics, the assertiveness of Labor was the most prominent element. It found expression immediately after the War in championing the demand of a large group of the population for an aggrandizement of the central Government's powers at the expense of those of the states. Labor believed that it might thereby more easily realize its desires for government control of industry, a common treatment of wage problems, and nationalization of key industries. Such a concentration of power, through constitutional amendment, had been advocated by Mr. Hughes until that object was achieved temporarily through the enactment of the war measures. In the elections of December, 1919, Labor strongly supported two referenda for such constitutional amendments and continued its agitation even after the proposals had been defeated. New political line-ups gradually made their appearance. Led by the Australian Workers' Union, which was organized, like the American Federation of Labor, on craft lines, Labor prior to 1919 had advocated issues and shaped programmes with the deliberate aim of enlisting middle-class support. But the growing conservatism and hostility to Labor of a section of the community induced a new radicalism, with industrial rather than political action emphasized. Labor swung far to the left, with an altogether Marxian insistence on class loyalty. At the same time, the farmers entered the political scene with a new party of their own, the Country Party. It opposed particularly the Socialist proposals of the Labor Party and the extension of the eight-hour day. Very perceptible hostilities thus appeared. Labor and industry alike were cold toward the Court of Conciliation. An Economic Conference in February, 1922, was a failure. With these antipathies reflected in politics, Mr. Hughes found himself confronted with three hostile parties, Labor, the Liberals, and the Country group. He hastened the elections,



therefore, and on Dec. 10, 1922, went to the country on the record of his administration. The results showed, in the Lower House, 27 Nationalists, 29 Labor, 14 Country, and 4 Liberals; in the Upper an increase of 11 seats for Labor to 8 for the Nationalists. Mr. Hughes felt himself discredited and resigned.

A new government was formed as a result of a Nationalist-Country-Liberal coalition, with Stanley M. Bruce as premier. The prevalence of new men was shown by the fact that seven cabinet members had had no previous Parliamentary experience, while Mr. Bruce had first been elected to Parliament in 1918, and Mr. Page, the Country leader, in 1919. The administration's programme accepted the necessity for unification in labor matters, taxation, and public-works development, and advocated a strong defense programme and greater application to the problems of immigration and land settlement. Little of this was realized by 1924, for the Government's leading concern was the keeping of Labor from power. In this, they were temporarily successful, but early in 1924 the Country Party ceased to support the Nationalist-Liberal coalition in state elections, and thus permitted Labor victories in Queensland, Tasmania, and Western Australia. For a while, five of the six Australian states had Labor governments, New South Wales being the only exception. In the broader sphere of imperial politics, Premier Bruce showed himself no whit less aggressive than his predecessor. Representing Australia in the Imperial Conference which met at London in October, 1923, Mr. Bruce made an outspoken plea for the adoption by the mother country of a protective preferential tariff which would give Australian and other colonial producers of meat and grain an advantage over American exporters, who, he declared, were driving Australian growers out of business.

In 1924 the Government adopted two important tariff changes, one increasing from 25 to 75 per cent the proportion of British workmanship required in goods receiving preferential treatment as British goods, and the other an agreement with Canada by which each dominion accorded the other preferential tariffs on specified lists of articles. The Australia-Canada agreement was hailed as of particular moment in that it was the beginning, it was hoped, of a process of linking together the parts of the Empire through tariff preferentials. A further step toward closer imperial relations was taken in 1924 when Australia and the British government each sent a liaison officer to the other, and when Australia adopted a military and naval programme designed to fit into the scheme of Empire defense. In that year the Government laid down a five-year navy-building programme which included, besides the construction of two 10,000-ton cruisers, two submarines, and later a seaplane carrier, the provision of naval bases, munitions works, airplane bases, etc. Both a Japanese fleet and a British fleet visited Australia in 1924, the latter arousing special enthusiasm because it included vessels which had become famous for their war exploits. In April, the country's only battle cruiser, the *Australia*, was ceremoniously sunk in accordance with the terms of the Washington Disarmament Conference.

In 1925 the visit of a large contingent of the United States Navy stirred the populations of Melbourne and Sydney to enthusiastic welcome.

Among the international interests of this period was the proposal for outlawing war advanced by the League of Nations, the so-called Geneva Protocol. It was looked upon with disfavor in Australia and in March, 1925, the Government announced a decision not to sign it. The interest of Australians continued to centre largely on domestic affairs, particularly labor problems. By the close of 1924, labor difficulties in shipping circles had reached an acute stage. Contention centred around the activities of the Shipping Labor Bureau in Sydney, which had been established in 1917 for the purpose of protecting strike breakers. It was used after the War as an agency through which ex-service men obtained the preference granted them by law when ships' crews were to be made up and, since many of these former soldiers were non-union men, the Bureau was a constant object of attack by the Waterside Workers' Trade Union, and later by the Seamen's Union. The union men demanded the abolition of the Bureau. Through December, the controversy raged and in the closing weeks of the year, despite all efforts of the Government to bring about a settlement, shipping was almost paralyzed.

On Jan. 12, 1925, a riot occurred in the streets of Sydney. The trouble was not settled until February 28, when the Bureau was abolished in accordance with the unionist demands. In June, further difficulty arose over a question of employment on ships in interstate trade while in port, resulting in a strike. In September, the country suffered from still another seamen's strike, this time called in England and affecting seamen on British vessels. For many weeks, it interfered drastically with trade with England. The successive disturbances emphasized strikingly the inadequacy of the powers of the central Government to deal with organized labor outbreaks and led to movements to strengthen the Government's hands. When the Federal Parliament met in June, the Government presented an amendment to the immigration act giving it power to proclaim a state of industrial unrest and, while such state continued, to deport persons not of Australian birth who were proved to be stirring up industrial strife. It also provided that aliens who might be difficult to assimilate or were otherwise undesirable could be denied admission to the country. The amendment having passed, although bitterly opposed by Labor, the Government in August proclaimed a state of industrial unrest, due to the shipping strike, and took steps to deport certain agitators. But the State of New South Wales, with a Labor premier, refused the use of its law-enforcement machinery in effecting the deportation, and the Federal Government rushed through Parliament a bill creating its own force of peace officers. The situation, however, had reached the point where an appeal to the country was felt to be necessary and, on September 16, it was announced that a general election would be held, the issue being declared by the Government to be whether the country was to be governed by its own elected representatives or by a few Labor extremists.

After a strenuous campaign, the election, held November 14, resulted in a victory for the two coalition parties. The Nationalists captured 38 seats in the House, the Country Party, 14, and Labor, 23. While Labor led all the other parties in the total popular vote, its total was some 257,000 under the combined vote of the coalition

parties. A compulsory-voting law was operative for the first time in this election and brought out more than 90 per cent of the eligible voters. The Government immediately took steps to deport two labor leaders, but in December the Supreme Court declared the Deportation Act unconstitutional and the men were released.

When Parliament met on Jan. 13, 1926, the governor general, Lord Stonehaven, recommended a number of measures aimed at the radicalism which was held responsible for the labor troubles of the previous year. Part of these were incorporated in the Commonwealth Crimes Bill, which was passed over strenuous Labor opposition. It provided that organizations which advocated or encouraged the overthrow of state or Federal governments by violence were illegal and that persons advocating such action or destroying or injuring property of the Commonwealth or property used in trade or commerce were subject to deportation, if not Australian-born, or to other severe punishment.

In May, the House of Representatives also approved two proposed amendments to the constitution and, in June, agreed upon the form in which they were to be submitted to a referendum vote. One of these gave the Commonwealth certain powers of regulating industry and commerce through control over trusts and similar combinations, and the other gave the Federal Government power to operate public utilities when the interruption of essential services was threatened. Both proposals were supported by the two factions in Parliament, but, when the referendum vote was taken on September 4, both were overwhelmingly defeated. The vote was a reiteration of many previous pronouncements of the people against increasing the powers of the Federal Government. It left the question of Federal authority over economic disturbances still unsettled. Premier Bruce declared that the Government had done all it could and that in case of future trouble its hands were tied.

Strikes and threats of strikes continued to vex the air. In September, 1927, a serious situation which threatened a tie-up of the whole Australian railway system arose when the Queensland Labor government dismissed a number of employees of the state-owned railway for refusing to handle the product of a sugar mill in which a strike was in progress. The firmness of the authorities and the pressure of public opinion brought about a settlement which was hailed as a victory for constitutional government and for moderate Labor over Labor extremists. In December, 1927, another strike and lockout among waterside workers tied up shipping and for a while blocked the exportation of wool at the height of the export season, and in September, 1928, still another serious shipping strike brought considerable commercial loss and was attended with much violence. Because of the failure to preserve order, it was reported, the Labor government of Victoria fell, November 14.

But with all these political and labor difficulties, the country's economic development went steadily forward. Commonwealth finances proved to be soundly based. The yearly surpluses were large enough to permit successive cuts in the income-tax rate, the raising of the invalid and old-age pension rate, and reduction of the Federal debt. The country returned to the gold standard in 1925 and in the same year a conversion loan of £67,000,000 was quickly oversubscribed by

Australian investors. In June, 1927, a conference was held at Melbourne between Premier Bruce and the six premiers and treasurers of the states at which important reforms in state and Federal financial operations were worked out, including an arrangement for the assumption by the Commonwealth of the large and growing state debts. The agreement, however, could be only partially put into effect without a constitutional amendment.

Later in the same year, a Royal Commission was appointed to study the constitutional powers of the Federal Government and recommend desirable changes. The specified subjects for its inquiry were aviation, company law, health, industrial powers, judicial powers, navigation law, taxation, trade and commerce, the interstate commission, and the admission of new states. An important factor in promoting Australian development was the organized encouragement of immigration. On April 8, 1925, a migration agreement was signed with the British government by which Great Britain advanced to the several Australian states £34,000,000 (part of it conditionally) at low interest rates to be used in construction of roads, railways and tramways, bridges, mills, and other aids to development, the states agreeing to provide for one British immigrant for each £75 received.

In 1926 the Migration and Development Commission of four was named. Its duties included advisory work in connection with the fund mentioned.

The exclusion legislation passed in the United States turned South European immigration toward Australia and aroused there a strong sentiment favoring an "all-British" as well as an "all-white" immigration policy. Labor opposed an active policy of encouraging immigration and in August, 1927, made a formal protest to the attorney general. It was disclosed on that occasion that about one-third of the gain in population since 1921 had been due to immigration. In accordance with its policy of promoting industrial development ahead of immigration, the Government in 1927 began work on the final section of a transcontinental north-and-south railway to connect Adelaide and Port Darwin. In 1926 the Northern Territory was divided into two states, to be known as North Australia, with capital at Port Darwin, and Central Australia, with capital at Alice Springs.

An outstanding event in Australian history was the opening, with great ceremony, of the new capital of the Commonwealth, Canberra. This took place on May 9, 1927. The Duke of York officiated as the representative of the King. The city was built especially for use as a capital. It is located on Federal Territory of some 900 square miles ceded for this purpose by the State of New South Wales. It is planned as a model city in which all building will be done in accordance with a prearranged design. Ownership of all land is retained by the Government, which grants long-time leases to private citizens.

The active interest in aviation was much heightened early in 1928 by the feat of Bert Hinkler in flying from England to Australia in the record time of 16 days. For the fiscal year 1927-28, it was announced that the Commonwealth finances showed a deficit of £2,642,000, attributed to a decline in customs and excise receipts and a succession of adverse seasons in certain primary industries. General elections were held Nov. 17, 1928. They resulted in a

victory for the two coalition parties, but a reduction in their strength in the House from 52 to 43 seats. Labor gained 9 seats and raised its total number to 32. On November 29, Premier Bruce announced a reorganization of his cabinet. In December, 1928, the State of Victoria began construction of a large £2,000,000 dam for the reclamation of a wide area of agricultural land.

The governors general over the period reviewed were: Sir R. Munro-Ferguson (1914-20); Lord Forster (1920-25); Lord Stonehaven (1925- ).

**AUSTRALIA, EARLY PEOPLES OF.** See ETHNOGRAPHY.

**AUSTRIA, LOWER.** A province of the Republic of Austria. In 1910 it had an area of 7654.4 square miles and a population of 3,531,814. In 1923 its area was 7452 square miles and its population 1,480,449. See **AUSTRIAN REPUBLIC**.

**AUSTRIA, UPPER.** A province of the Republic of Austria. Its area in 1910 and 1923 was 4626.3 square miles. Its population in 1910 was 853,006; in 1923, 876,074. See **AUSTRIAN REPUBLIC**.

**AUSTRIA-HUNGARY, or THE AUSTRO-HUNGARIAN MONARCHY.** In October, 1918, the Austro-Hungarian Monarchy collapsed. Out of its former constituent elements, the Austrian Empire and the Hungarian Monarchy, emerged a group of succession states whose territories were made up in whole or in part of the old Austrian and Hungarian provinces. Of these succession states, the following were formed entirely of Austrian and Hungarian territories: The Republic of Austria, the Kingdom of Hungary, and the Republic of Czechoslovakia. The new states of Poland, Jugo-Slavia, were formed, in part, of Austro-Hungarian territories. (See **HUNGARY**, **CZECHOSLOVAKIA**, **POLAND**, **JUGOSLAVIA**, as well as **RUMANIA** and **ITALY**, which also made territorial gains as a result of the dissolution of the Dual Monarchy, and **TYROL**, **GERMAN SOUTH**; **KLAGENFURT BASIN**, **BURGENLAND**, **PIUME-ADRIATIC CONTROVERSY**, **BANAT**, **TRANSYLVANIA**, **GALICIA**, and **TESCHEN**, **ZIPS**, and **ORAVA**, scenes of territorial disputes arising out of the peace treaties.) The present article contains a discussion of the foreign policy of Austria-Hungary, during the years 1914-18, which is based to some extent on the researches and writings of the well-known Austrian historian, A. F. Pribram, notably his *Austrian Foreign Policy, 1908-18* (London, 1923). There is also a consideration of the internal political history of the Austrian Empire, 1914-18. An account of the recent history of the Austrian Republic is given under that title. Hungary is treated under the title **HUNGARY**.

**Foreign Policy of Austria-Hungary, 1914-18.** As a result of the Balkan Wars, the Dual Monarchy suffered considerable loss of prestige. The weakening of its position in the Balkans, and the triumph of Serbia in the second Balkan War, were circumstances as unfavorable to the security of the Hapsburg monarchy as they were favorable to the development of a violently anti-Serbian and anti-Slavic policy at Vienna, where it was keenly realized that, among the 24,000,000 Slavic subjects of the Emperor-King, no small number sympathized with Pan-Serbian and Pan-Slavic aims. In Serbia, the Viennese statesmen saw a direct menace to the Jugo-Slav provinces of Bosnia, Croatia-Slavonia, Dalmatia,

and Carniola; and, behind Serbian-Jugo-Slav nationalism, they fancied they perceived a menacing Russian Pan-Slavic design which, if not balked, would culminate in the dismemberment of the polyglot Danubian monarchy. To regain prestige and influence in the Balkans seemed vitally necessary. But Austro-Hungarian diplomacy tried in vain to compose agreements between Bulgaria on the one hand and Rumania, Turkey, and possibly Greece, on the other. These efforts proved fruitless because of the divergent interests and the mutual distrust of the Balkan States. In fact, they served to estrange Rumania and Bulgaria from Vienna, as the rapprochement between Rumania and Russia showed, following the meeting of King Charles and Czar Nicholas at Constanza on June 14, 1914. The treaty between Bulgaria and Turkey fell through, and so did the compromise between Rumania and Bulgaria and the attempt to bind Greece closer to the Triple Alliance. These difficulties were aggravated still more by the fact that Berlin and Vienna disagreed as to the service which the respective Balkan States would be able to render to the Triple Alliance. Berlin held that Bulgaria should be sacrificed to Rumania, while Vienna feared that, in case Rumania should refuse to consider such a proposal, it would be confronted at some future time by a solid Balkan bloc under the leadership of Russia. Count Berchtold succeeded finally in convincing Berlin of the soundness of the Vienna viewpoint, and from March, 1914, the fundamental aim of the Balkan policy of the Central Powers was to bring Bulgaria entirely into their camp. At the same time, the relations between the Dual Monarchy and Italy grew steadily colder, and although in the Conference of Abbazia, San Giuliano and Berchtold came to an agreement in April, 1914, it became clearer every day that soon the growing sympathy of the Italians for the Entente would seriously endanger the Triple Alliance. Vienna's apprehensions in regard to Italy and the ever-increasing influence of the Entente in that country were allayed, however, by the knowledge that negotiations were going on between the English and the Germans for the establishment of more amicable relations. These efforts were heartily seconded by Count Mensdorf, the Austro-Hungarian Ambassador in London. Meanwhile, Vienna believed that France and Russia had succeeded in creating a Balkan League and, under that impression, Konrad von Hützendorf, chief of the general staff, drew up on June 22, 1914, a memorandum in which he painted the Balkan situation as very dark for Austria-Hungary and requested that Rumania be compelled to commit herself for or against the Central Powers and that in the latter case an alliance be formed with Bulgaria. A similar memorandum was prepared by Foreign Minister Berchtold for Berlin; in this, the imperative need for the formation of a Balkan League, not including Serbia, and under the leadership of the Central Powers, was stressed. Before this memorandum could be presented, events occurred which immediately changed the entire situation. On June 23, 1914, Francis Ferdinand, the Austro-Hungarian heir to the throne, and his consort were assassinated at Sarajevo in Bosnia. The resulting Austro-Hungarian ultimatum to Serbia, and the outbreak of the War are described elsewhere (see **WORLD WAR**). The above-described policy was of prime importance in bringing the War to pass.

In taking a gambler's chance of crushing Serbia without Russian intervention, the reckless Berchtold was opposed by saner statesmen, notably Count Tisza, chief spokesman of the Hungarian ruling class.

Italy refused active aid to Austria-Hungary in her struggle with Serbia on the ground that her treaty did not oblige her to, but she raised the question of future compensation, a request which was granted by Vienna under pressure from Berlin, with the proviso that Italy would fulfill her treaty obligations. Italy denied again that a *casus foederis* existed and remained neutral. Likewise, Rumania failed to join the Central Powers, although she was promised Bessarabia. Rumania maintained that her construction of her treaty obligations did not warrant the abandonment of her neutrality. The Central Powers were more successful in regard to Turkey. The Austro-Hungarian Foreign Office supported all promises and concessions made by Germany to Turkey in the early weeks of the War for the purpose of inducing the latter to enter the camp of the Central Powers. All efforts on the part of Austria-Hungary, to have Bulgaria take an active part in the War against Serbia, so that her own armies might be released to meet the ever-growing pressure from the Russians on the eastern front, remained fruitless, because Ferdinand of Bulgaria was too clever to commit himself, until the military superiority of the Central Powers should be definitely established. Advice from Berlin in favor of territorial concessions to Rumania and later counsel not to oppose a march of Rumanian troops into Transylvania were strongly opposed by the Hungarians and hence not heeded by Berchtold. After the death of King Charles of Rumania, on Oct. 10, 1914, the Rumanian situation became even more unsatisfactory, for Ferdinand, the new king, was less friendly to the Central Powers than his uncle had been, and although he remained neutral, he would not bind himself to an agreement not to march against the Central Powers, in spite of all efforts made in this direction by Count Czernin, the able Austro-Hungarian Minister in Bucharest. Meanwhile, the negotiations with Sofia advanced or lagged in accordance with the military victories or reverses of the Central Powers. Although in the beginning of 1915, Vienna, in conjunction with Berlin, was ready to grant the far-reaching territorial demands of Bulgaria, provided the latter country entered the War on the side of the Central Powers, Ferdinand of Bulgaria decided to remain neutral for the time being in view of the unfavorable military situation. During the remainder of 1914, Italy maintained her neutrality as well as cordial relations with the Entente. Regardless of Berchtold's previous refusals, Baron Sonnino, the new Italian Foreign Minister, let Vienna know plainly in December, 1914, all previous approaches in this direction having been made through Berlin as intermediary, that territorial concessions on the part of Austria-Hungary were desired by Italy as compensation for her future neutrality. New negotiations began thereupon between Rome and Vienna in the middle of December, but Berchtold still refused to consider the Italian demands. On Jan. 13, 1915, Count Berchtold was replaced by Baron Burian. In view of seemingly unfavorable military and diplomatic circumstances and under strong pressure from Germany, Burian opened in March, 1915, new negotiations with Italy, in

the course of which the latter demanded extensive territorial concessions and the immediate transfer of the ceded districts. The latter demand was flatly rejected by Burian, but Italy was offered the major part of German South Tirol. This Sonnino refused to accept and he presented on Apr. 10, 1915, a memorandum in which Italy demanded the whole of South Tirol, Gorizia, and Gradisca, and made a number of other requests, the fulfillment of which would have amounted in substance to the establishment of Italian supremacy in the Adriatic. Italy would promise neutrality for the duration of the War in return for these concessions. Due to the grave military situation at the time, Burian did not directly refuse these exorbitant demands but strove to keep the negotiations open and gradually increased his offers. His efforts were frustrated, however, by the conclusion of the Treaty of London on Apr. 26, 1915, under which Italy bound herself to join the Entente within a month. On May 3, 1915, Italy decided to declare its alliance with Austria-Hungary dissolved. Vienna was now willing to grant the full demands of the Italians, but without avail, for Italy declared war on the Dual Monarchy on May 23, 1915.

Vienna's tardy willingness to make great sacrifices for the sake of an understanding with Italy had to a large extent been determined by the knowledge that Italy's declaration of war would ultimately be followed by that of Rumania, since on Feb. 6, 1915, the agreement of September, 1914, between Italy and Rumania had been renewed and had received an additional stipulation whereby the two countries pledged themselves to mutual assistance in case of an unprovoked attack on the part of Austria-Hungary on either one. As a result of the negotiations between Rome and Vienna, Bucharest had immediately increased its demands, which included now Transylvania in addition to the Bukovina. Vienna's refusal of these demands strengthened the influence of the Entente in Bucharest still further. The situation seemed critical for the Dual Monarchy, when suddenly the news of the great victory at Gorlice, May 2, 1915, arrived. This tremendous military success and the subsequent events in Galicia and Poland during the summer of 1915, were powerful factors in helping the Rumanians to decide on neutrality for the time being. The Rumanian horizon cleared up, the Central Powers turned their chief attention to Bulgaria, for Turkey's lack of arms and ammunition made the establishment of direct land communication with that country necessary. During the first half of 1915, the Bulgarians had been continually negotiating with both the Central Powers and the Entente. Under the influence of the victories, the prospects of the Central Powers in Sofia became much brighter, and on Sept. 6, 1915, treaties were signed between Austria-Hungary and Bulgaria, whereby Bulgaria pledged herself to enter the war against Serbia and was promised in return the whole of what is today Serbian Macedonia. It was further provided that, in case Rumania and Greece should enter the War on the Allies' side, Bulgaria should receive the territories ceded by her to these states under the Treaty of Bucharest (1913). With the conquest of Russian Poland in the summer of 1915, the Central Powers were confronted with the serious problem of the final disposition of that country. No agreement could be reached, till the defeat of the troops of the Dual Monarchy

in the Brusiloff offensive of August, 1916, gave the German proposal for the creation of an independent state the preponderance. Still no definite steps were taken. A proclamation on Nov. 5, 1916, promised to the Poles the restoration of an independent Poland under a hereditary monarchy. Meanwhile, the divided administration of the country by the Germans in Warsaw and the Austro-Hungarians in Lublin continued.

During 1916 the Central Powers carried on continuous negotiations with Rumania. Their offers, which were conditional on Rumania's entrance into the War on their side, were refused by the Rumanian statesmen, who were at the most prepared to concede only neutrality. Germany and the Austro-Hungarian High Command urged far-reaching concessions in Bukovina and Transylvania, but Burian and the Hungarians were not willing to consider such proposals. At the same time, the influence of the Entente in Bucharest grew stronger all the time and the Austro-Hungarian defeats in Russia in August, 1916, served to strengthen the conviction of the Rumanians that the ultimate superiority in the War lay with the Allies. Burian continued his steadfast refusal to grant the Rumanian demands and at the end of August, 1916, an agreement was concluded between the Allies and Rumania whereupon the latter, on August 27, entered the War against the Central Powers. In order to allay Turkish fears growing out of Rumania's entrance into the War, Germany concluded two agreements with Turkey on Jan. 11 and on Nov. 27, 1917, which provided for the abolition of the capitulations. The Dual Monarchy hesitated for a long time to come to similar agreements with Turkey, and only on Mar. 30, 1918, was a treaty signed between Turkey and Austria-Hungary under which the latter bound herself not to sign any peace reestablishing the capitulations. The weariness of the Austro-Hungarian people, who had suffered more from the War and were in a much weaker condition than their German allies, induced the Vienna government to address itself to Berlin in the fall of 1916 with the proposal to inquire through neutral channels whether the Allies were prepared for a discussion of peace. Germany objected and for a time there was a lively exchange of opinion between the two governments. Finally an agreement was reached. Emperor Francis Joseph had died meanwhile and Charles had ascended the throne. The latter was determined on the conclusion of a peace satisfactory to both sides. On Dec. 12, 1916, the Quadruple Alliance made its peace offer, proposing a conference of the Powers. Austria-Hungary at this time was ready to conclude a peace which left her territory intact and gave her minor frontier rectifications. The offer was met on Jan. 12, 1917, by the answer of the Allies to President Wilson's peace proposal. Thereupon, Germany started her campaign of submarine warfare. Neither Count Czernin, who in the meantime had become Austro-Hungarian Foreign Minister, nor Emperor Charles entertained the sanguine hopes which the Germans placed on this policy and they gave their consent to it only under pressure from the German statesmen and generals, and the Emperor. Czernin, in fact, pointed out the danger of war with the United States. While war broke out between Germany and the United States on Apr. 6, 1917, the United States did not declare war on Austria-Hungary until Dec. 7,

1917. As the results of unlimited submarine warfare fell short of expectation, Emperor Charles on Mar. 24, 1917, through his brother-in-law, Prince Sixtus of Bourbon-Parma, proposed peace pourparlers and assured France of Austrian support for her "just claims" on Alsace-Lorraine. On Mar. 27, 1917, Count Czernin, who knew the substance of the offer, but not the text, signed an agreement with the German Chancellor which contained a minimum and maximum programme for peace neither one of which provided for ceding Alsace-Lorraine to France. On Apr. 3, 1917, and repeatedly afterwards, Count Czernin approached the German Emperor and his statesmen with a peace proposal which suggested possible cession of Alsace-Lorraine to France and, as compensation for this sacrifice, the annexation of Poland to Germany. Such a proposal the Germans refused to consider. Shortly thereafter, the Prince Sixtus move came to naught, because the Italians insisted on territorial concessions as promised by the London Treaty, which Austria-Hungary was not prepared to grant at this time. Under these circumstances, Emperor Charles and Czernin concluded, on May 17-18, 1917, an agreement with Germany which provided for large Austro-Hungarian annexations in the Balkans and, on the fulfillment of these conditions, for the surrender of Austro-Hungarian interests in Poland to Germany. Czernin, however, during the remainder of 1917, continued his efforts in various directions toward a peace by agreement, but without result.

A ray of light appeared with the Bolshevik ascent to power in the East. The new Russian government issued a summons for a general peace and, on the refusal of the Entente to consider it, began peace negotiations with the Quadruple Alliance on Jan. 9, 1918. Various difficulties arose, some of which led to the conclusion on Feb. 9, 1918, of a separate peace between the Ukrainians and the Quadruple Alliance. Under this peace, the Austro-Hungarian frontiers remained unchanged, but the Dual Monarchy promised to surrender the district of Cholm, in Russian Poland, for incorporation into the Ukrainian Republic, and to make Galicia an autonomous Austrian Crownland. After further difficulties with the Soviet delegates, in which Czernin was often at variance with the German spokesmen and which brought about a temporary renewal of the war with Russia, a peace treaty was signed on Mar. 3, 1918, at Brest-Litovsk. From this peace, the Dual Monarchy received no territorial enlargement. Poland having become an independent state under the Brest-Litovsk Treaty, the Polish question came up once more. The decision of the previous year, to leave Poland to Germany, was abandoned, and Charles and Czernin advocated in its stead the Austro-Polish solution, which provided for the incorporation of Poland in Austria-Hungary. This scheme was opposed by the German government, which would merely consent to a personal union between Poland and the Dual Monarchy. This latter proposal Vienna refused to accept. The Poles made skillful use of this disagreement between the two Powers and obtained the signature of the latter to a protocol providing for a future rectification of the frontier between Poland and the Ukraine. Count Hertling, the German Chancellor, advised Vienna in July, 1918, that Germany would not accept the Austro-Polish solution and would leave it to the Poles to choose their form of government,



provided that they came beforehand to an agreement with the Central Powers. Vienna accepted in principle, but succeeding negotiations failed to bring a solution. The peace with Russia led also to the signing of the Peace Treaty of Bucharest on May 7, 1918, which gave Austria-Hungary a strategic frontier with Rumania and valuable economic advantages.

The favorable settlements gained in the East could not, however, hide the grave condition of the Dual Monarchy, which was in urgent need of peace. Czernin, fully aware of this, attempted unsuccessfully in various ways in the early months of 1918 to bring about a cessation of hostilities. He even approached President Wilson through the King of Spain. The only possible road which could lead to peace for Austria-Hungary, namely, the conclusion of a separate peace with the Allies, which would have been equivalent to leaving Germany in the lurch, Czernin refused to take. The ultimate failure of the great German effort in the West made the Germans more amenable to the Austro-Hungarian insistence on peace by diplomacy, although before August they had rejected all of Charles's and Burian's efforts in this direction. Since Vienna and Berlin could not agree on a proper course of action, Burian made finally, without Germany's participation, an appeal to the Allies which was turned down flatly and resulted in revealing to the Entente in a more glaring light than ever the desperate straits of the Dual Monarchy. The catastrophic military events of the early fall and the defection of Bulgaria and Turkey ushered in the last act of the drama. The Austrian collapse followed rapidly. Austria-Hungary and Germany appealed to President Wilson for an armistice. When Wilson failed to reply, Emperor Charles in a manifesto on October 16 proclaimed Austria a federal state. Wilson rejected the peace offer, finally declaring that the United States recognized Czechoslovakia as an independent state and acknowledged the national aspirations of the Southern Slavs. The dissolution becoming manifest now, Charles was ready to make a separate peace at great sacrifice, provided the territories remained under the dynasty, no matter in how loose a federation. The débâcle in Italy brought about the final disintegration. On November 3, the Dual Monarchy was forced to sign an armistice which turned her over, defenseless, into the hands of the victors and compelled her to give passive aid against her ally. Emperor Charles agreed to this under protest. But the catastrophe went still further. Charles gave up his share in the Austrian government on November 11, without, however, renouncing his crown. The Lammasch government finished its task of liquidation and resigned. The proclamation of the Austrian Republic on November 12 and of the Hungarian Republic on November 16 completed the disintegration of the Dual Monarchy. For the Treaty of St. Germain and the Treaty of the Trianon, see **PEACE CONFERENCE AND TREATIES**.

**Internal Political History of the Austrian Empire, 1914-1918.** All predictions to the contrary notwithstanding, the outbreak of the War evoked from the various nationalities comprising the Austrian Empire loud protestations of their loyalty to the dynasty and the state. Even the Czechs gave evidence of their enthusiastic support of Austria's cause in the War, and the Austrian Poles called for a union of Russian

Poland and Galicia under the Hapsburg Crown. Likewise, most of the Italians in the Tirol remained faithful after Italy's entrance into the War. In spite of these favorable demonstrations, the Austrian government did not deem it advisable to convoke Parliament. The ministry was in a position of almost complete political impotence and practically all control over internal affairs was in the hands of the military, which used rigid and shortsighted police measures. This system led finally to the assassination of the premier, Count Sturgkh, on Oct. 21, 1916, by the Socialist, Friedrich Adler. Under his successor, Dr. Körber, little change was wrought in the internal affairs of Austria. The only outstanding event of his administration was the creation of an Office for Food Control on Nov. 14, 1916, which was later enlarged into the Food Ministry. On the death of the aged Francis Joseph, Nov. 21, 1916, young Charles Francis Joseph, as the nearest heir, inherited his great-uncle's crown. Emperor Charles, ambitious and intelligent, was resolved not only to maintain the greatness of his dynasty but also to effect a constitutional readjustment more satisfactory to the non-German peoples of the empire and to restore peace at the earliest opportunity. Himself assuming supreme command of the army, he proceeded to replace many of the highest officials with his own trusted friends. That the highhanded measures of the military rule and the economic hardships produced by the War had not yet at this time seriously affected the allegiance of the various nationalities to the Crown was evinced by the numerous declarations of loyalty which followed on President Wilson's note of Dec. 11, 1916, and the answer of the Entente of Jan. 12, 1917, in which reference had been made to the oppressed nationalities of Austria. At the same time, however, actual attempts at ironing out the conflicts and difficulties between the nationalities proved futile. On the final convocation of Parliament, on May 31, 1917, the Southern Slavs and the Czechs demanded the creation of a federal state, and the German Austrians offered strong opposition to any such proposal. Under these circumstances, Clam-Martinitz, who had hoped for a national coalition, resigned on June 19, 1917, and was succeeded by Ritter von Seidler. On account of the amnesty granted the Czech political offenders on July 2, 1917, the German National Council at Prague passed on July 15 a vote of censure. With a reorganized cabinet, Seidler embarked in August, 1917, on a vast plan of social, economic, and political reform, which, however, proved a complete failure. In fact, his attempts at reconstructing the state on the basis of national autonomy served to reveal to what extent dissolution had progressed. The nationalities advanced demands now which could hardly be reconciled with the unity of the Empire. The calling of a fresh Parliament on June 16, 1918, proved no remedy. The previous day, the Czechs had set up at Prague a national committee demanding a sovereign and independent Czechoslovak state. Seidler resigned on July 22, 1918. Baron Hussarek, his successor, attempted in vain to reconcile the nationalities. Disintegration had gone too far. The Czechs won Allied recognition in August and were acting as an independent nation. The Poles, too, had become intractable, although Hussarek advocated Polish independence. As a last means to avoid dissolution, the Emperor issued on Oct. 16, 1918,



his manifesto proposing a federal state for Austria. Its effects on the nationalities was null, because at the same time they were beginning to set up national councils. Disintegration was an established fact. The last imperial cabinet, the ministry of liquidation with the pacifist Lammasch as premier, Oct. 27-31, 1918, could do no more than help the peaceful settlement between the rising Republic of Austria and the succession states, Czechoslovakia, Jugoslavia, and Poland.

**AUSTRIAN REPUBLIC.** The Austrian Empire had an area of 115,831.9 square miles and a population of 28,571,934 in 1910. As a result of the Treaty of St. Germain (Sept. 10, 1919), the plebiscite decision in the Klagenfurt district, and the ruling of the Council of Ambassadors with respect to the Burgenland, the Austrian Republic had, according to the census of 1923, an area of 32,369 square miles and a population of 6,534,481. (See BURGENLAND and KLAGENFURT.) The density per square mile was 202; females in the population were in the ratio of 1089 to 1000 males. The Republic consists of the following provinces: Vienna, Lower Austria, Upper Austria, Salzburg Styria, Carinthia, Tirol, Vorarlberg, and Burgenland. The leading towns gave these population figures for 1923 (1910 figure in parentheses): Vienna, 1,865,780 (2,031,498); Graz, 152,706 (151,886); Linz, 102,081 (67,817); Innsbruck, 56,401 (53,194); Salzburg, 37,856 (36,210). From 1916 to 1919, deaths continued to exceed births, the excess being 31,815 in 1916, 66,877 in 1918, and 14,555 in 1919. Births in 1926 numbered 118,939, and deaths, 94,081. Distribution by religions was thus given in the 1910 census for all this area except Burgenland: Catholics, 5,979,667; Protestants, 165,007; Jews, 189,758. As for education, there were, in 1925, 5252 elementary schools attended by 717,571 pupils, 145 secondary schools with 44,513 pupils; and three universities, viz., Vienna (9511 students), Graz (2347 students), Innsbruck (1567 students). Besides, there were 2 technical high schools and 13 theological schools.

**Industry.** Agriculture forms the main occupation of the country. In 1926, 4,766,708 acres were under crops, largely in Lower Austria and Upper Austria. The leading crops are wheat, of which 10,360,000 bushels were counted in 1927; rye, 18,168,000; barley, 10,315,000; oats, 28,747,000; potatoes, 83,724,000; turnips, 1,202,449 metric tons. Deprived of the agricultural products of the rich provinces of Moravia, the Alpine forelands, Bohemia, Galicia, Istria, and Goritz, the Austrians were compelled, after the War, to import their food stocks from Hungary, Bohemia, Russia, and Rumania. Live stock numbered in 1923: horses, 282,651; cows, 1,074,864; oxen, 302,103; bulls, 68,143; calves, 717,236; swine, 1,473,000; sheep, 597,000; goats, 312,499. Mineral supplies are scarcely adequate for local wants. In 1926, 2,957,700 metric tons of lignite coal were mined and 157,300 tons of anthracite. Iron ore mined in 1926 totaled 1,094,400 tons, largely from Styria. Other minerals are copper, zinc, lead, and salt. The leading industrial centres are in Lower Austria, Vorarlberg, and Upper Styria, where iron foundries and machine, automobile, textile, and clothing factories are gathered. Chemical and paper goods works are grouped chiefly around Vienna, which is also the centre of the artistic trades.

**Trade and Communications.** The first years

of the Republic showed heavy adverse balances, which, however, continued to decrease. In 1921 imports of 8,228,249 metric tons were valued at \$349,960,000; exports of 1,546,532 tons were valued at \$186,259,000. For 1922 imports weighed 7,448,737 tons and were worth \$327,721,000; exports were 2,115,760 tons, at a value of \$209,944,000. For 1927 the imports were valued at \$427,912,000 and the exports at \$278,345,000. During 1926 the greatest amount of imports by value, came from Czechoslovakia, \$75,500,000; from Germany, \$65,651,000; from Hungary, \$48,345,000. Exports to Czechoslovakia totaled \$20,069,000; Germany, \$28,407,000; Italy, \$23,877,000; Hungary, \$23,511,000. Up to 1923 trade was hard hit by Germany's disastrous competition in foreign and domestic commerce. The situation improved after 1923, particularly with respect to the Balkan trade, because of the disorganization of German industry and transportation, consequent upon the Ruhr occupation, and because of the German tendency to quote prices only in foreign currencies. In 1923, however, the unfavorable trade balance had mounted up to \$163,000,000. Replacements of depreciated stocks were heavy in this first year of Austria's reconstruction; imports were many to avoid future turnover taxes, and many purchases were made in Germany with the stabilized Austrian crown, all of which helped bring this about. The factors of invisible exchange were also effective. Vienna was the banking centre of the Succession States as well as the wholesale centre; Austria had large interests in the industries in the Succession States; the tourist trade was considerable. Discounting these conditions, the adverse balance was still high, and it was an important reason for Austria's economic plight.

The country had, in 1926, 4128 miles of railway, of which 3608 were state-owned. The principal lines were the Western, the Northern, Northwestern, Eastern, and Franz Josef railways, the last connecting Vienna with Czechoslovakia. Not until July, 1923, was the Government able to see its way out of the hopeless railway tangle. From the end of the War, the railways had been regularly operated at a loss, because the portion of the railway system left in Austria contained a high percentage of mountainous track, which, before the War, had been counterbalanced by the level stretches in the territories now belonging to Czechoslovakia, Hungary, and Poland; it was necessary to import fuel; a surplus of personnel prevailed; the government operation was unprofitable. To meet the situation, by the law of July 19, 1923, a corporation was created to conduct operation under a centralized control. The Government financed the venture with a capital of 200,000,000,000 crowns and placed control in the hands of a directorate of 14, 11 of whom were to be business men or transportation experts, and 3, representatives of railway employees. To the Government were reserved the rights to regulate tariffs, approve loans, supervise social and safety measures, and regulate construction. River traffic was equally hard hit by the loss of ships and barges during the War.

**Finance.** Nothing revealed so completely the helplessness of the country after the War as the unsatisfactory condition of government finances. Revenues for 1921-22 were 93,325,000,000 paper crowns, or \$42,276,000; for 1922, they were 209,763,000,000 crowns, or \$169,698,-

000; for 1923, they were estimated at 11,488,267,000,000 crowns, or \$160,836,000. Expenditures for 1921-22 were 258,229,000,000 crowns (\$116,978,000); for 1922, 347,533,000,000 (\$281,154,000); for 1923, 13,862,760,000,000 (\$194,079,000). Thus, the deficits were \$74,701,000 \$111,456,000, and \$33,243,000. From 1919 to 1921, conditions steadily grew worse, so that on Jan. 11, 1921, the Austrian government confessed itself at the end of its resources and offered to turn over the country's administration to the Reparations Commission which the Treaty of St. Germain had established in the country. Finally, on Sept. 27, 1922, the League of Nations accepted responsibility for the economic rehabilitation of Austria, and in so doing, practically established a dictatorship over the Republic. The plan accepted included the placing of a loan of \$135,000,000 for 20 years among Italy, Great Britain, France, and Czechoslovakia; the appointment of a commissioner general by the League of Nations to direct expenditures; a committee of control to represent each of the guarantor governments; the setting aside of gross receipts from customs and the tobacco revenue as security; the promise on the part of Austria to eliminate the deficit by 1925. The Austrian government agreed to push retrenchments, cut down personnel, etc. On Feb. 1, 1923, the League of Nations authorized the issuance of the loan. Of this, American bankers took \$25,000,000, at 7 per cent for 20 years. On February 21, the Reparations Commission renounced all rights to Austrian property and revenues for 20 years. As an indication of good faith, the Austrian government between September, 1922, and October, 1923, dismissed 50,000 functionaries; on Nov. 22, 1922, heavy increases were announced in the income tax, the tax on shares, and the turnover tax. Under Dr. Zimmermann, the League Commissioner General, appointed in December, 1922, the financial reforms were pushed and the success with which they met was indicated by the fact that the draft budget of 1924 carried a deficit of 836,900,000,000 paper crowns as against the 1923 deficit of 2,664,200,000,000.

The success of the rehabilitation of Austrian finances under Dr. Zimmermann was phenomenal. The budget for 1925 showed actual receipts of \$151,500,000 against actual expenditures of \$140,800,000. On the basis of this showing the financial control by the League of Nations was withdrawn in 1926. In that year, receipts totaled \$181,100,000 and expenditures \$165,700,000; 1927, \$167,200,000 and \$174,100,000; 1928, \$155,900,000 and \$175,000,000. The deficits for 1926, 1927, and 1928 are explained by capital investments in railways, posts and telegraphs, etc. The public debt amounted to \$338,739,000 on Dec. 31, 1926, as against \$349,266,000 at the end of the previous year.

**Economic Conditions.** Its state condition made it inevitable that the Austrian Republic should turn to the printing press to meet current expenses. In June, 1919, 7,000,000,000 paper crowns were in circulation; at the end of 1920, 30,600,000,000 paper crowns, with a metallic reserve of 8,807,000 gold crowns; 1921, 181,000,000,000 paper crowns, with 10,022,000 gold crowns in reserve; 1922, 4,080,400,000,000 paper crowns, with 356,000 gold crowns in reserve. That the currency should depreciate with this unprecedented inflation was inevitable. The gold crown at par is worth \$2026. On Jan. 1, 1922, the paper crown was worth \$.000387; on

Jan. 1, 1923, \$.00014. In June, 1924, a new currency unit, the schilling (par \$0.1407; 1 schilling = 10,000 paper crowns) was adopted and gold reserves were supplied by an international loan. The cost of living mounted. Compared with the figures for 1914, it rose to 13 in December, 1918; 69 in January, 1921; 662 in January, 1922; and 11,271 in December, 1922. By the end of 1927, it was only 6 per cent above 1914. The establishment of the rehabilitation scheme at once changed tendencies for the better. Unemployment naturally mounted with the general breakdown. In May, 1919, 186,000 persons were out of work, 132,000 of them in the Vienna district alone; in December, 1927, the number of unemployed was 207,000. The government applied itself to the problem of relief doles; in April, 1919, 46,000 were receiving aid; in December, 1927, 207,120.

**History.** The proclamation of the Republic of Austria on Nov. 12, 1918, left the country in a precarious political and economic situation. Its territory had been materially reduced and comprised not even all of the German language districts of the old Austrian Empire. The government was carried on by the provisional National Assembly which had convened on Oct. 21, 1918. On Feb. 16, 1919, a National Constituent Assembly was elected, in which the Socialists and the Christian Socialists held a majority. The Assembly elected the Socialist, Seitz, President of the new Republic and appointed on Mar. 15, 1919, a ministry with Dr. Karl Renner as Chancellor. The new Government launched a programme of extensive social and economic reform, including abolition of the feudal nobility and nationalization of the means of production; but confronted with serious internal difficulties, it was not able to proceed very far along these lines. As a result of the spread of revolutionary ideas and of the very bad economic conditions, notably the lack of foodstuffs, Communist agitation developed which had to be put down by force. The establishment of a Soviet Republic in Hungary strained relations with that country, for the Austrian government was in constant fear of a rising among its own ultra-radical elements with active support from the Hungarians which, indeed, might have proved serious, since the feeble Austrian army was in part strongly Bolshevik in sympathy. Meanwhile, the internal situation grew steadily worse. Except in the German language and nationality, there was no bond of cohesion in this country, which, against its will, was forced by the dictum of the victors to exist as an independent state. The old antagonism between the city of Vienna, comprising one-fourth of the population of Austria, and the agricultural sections, which were unwilling to supply the food without which Vienna was doomed to starvation, assumed at times serious proportions and threatened the very existence of the metropolitan population. The terms of the Treaty of St. Germain to which Chancellor Renner affixed his signature on Sept. 10, 1919, served to aggravate the internal situation still further by blocking the much desired union of German Austria with Germany which had been decreed by the Fundamental Law of Nov. 12, 1918, and by declaring the independence of Austria inalienable without the consent of the League Council.

The withdrawal of socialist support from the coalition forced the ministry to resign on June 11, 1920. Pending a new general election, the

Christian Socialist Dr. Michael Mayr presided over a Proportional Cabinet representing all parties. On Oct. 1, 1920, a new constitution was promulgated which was a formidable document indeed and which went into much more detail than customary. It declared Austria a democratic republic, composed of seven states and the city of Vienna. Austria became thereby a federal state in place of the old Austrian centralized state. All privileges were abolished and equal rights were given to all citizens. Universal suffrage for women as well as for men was established, and the voting age was set at 21. Executive power was vested in a president chosen for four years and a cabinet appointed by the Assembly. Legislative power belonged to a Parliament of two chambers, an Assembly elected for four years by popular vote and in accordance with the principle of proportional representation, and an Upper Chamber elected by the provincial diets in proportion to the population of the states. Since the Upper Chamber was given only advisory powers, the Parliament consisted in fact of only one chamber. The President was to be elected in a joint session of both chambers.

The elections (on Oct. 17, 1920) proved a victory for the moderate policy of the Christian Socialists, who obtained 82 seats as compared with 66 for the Social Democrats and 19 for the Pan-Germans. Dr. Mayr now formed a Christian Socialist cabinet, braving the open opposition of the Socialists. Dr. Michael Hainisch, well-known as a sociological writer and formerly a Socialist but now rather nonpartisan, was elected President of the Republic by the new Assembly on Dec. 9, 1920. A ray of light illumined the abysmal scene when the decision of the Klagenfurt plebiscite (q.v.), on Oct. 10, 1920, saved the territory for Austria. This was a valuable territorial acquisition in view of the agricultural productivity of the region. Another favorable turn was the admission of Austria into the League of Nations in December, 1920. But the economic plight of the country had grown worse meanwhile. With the approaching winter of 1920, Austria was in dire need of food and fuel. Her production of these necessities of life was small in comparison with her needs. Purchase of these commodities in foreign countries was precluded by lack of funds, a deficit in the budget, and an ever-mounting inflation of the currency. If anything, this situation became worse during the course of 1921 and it was evident that the unfortunate country was headed for disaster. By October of that year, the crown had become practically worthless. While the people were facing famine, the Government made desperate attempts to obtain financial aid abroad. In the spring of 1921, it requested the Finance Committee of the League of Nations to procure the necessary funds for the purchase of foodstuffs. The League sent representatives to study the Austrian problem. Meanwhile, the economic distress and the apparent uninterest of the outside world had made the Austrians even more weary of an independence which was forced on them and had aroused an almost desperate desire for union with Germany. Alarmed by the extent of the movement, the Allies declared on Apr. 14, 1921, that all agitation toward this end must cease forthwith, lest the Allies withdraw their proposals for financial relief. The Government was forced to curb the movement, whereupon a section of the Chan-

cellor's party refused him support, compelling the Mayr Ministry to resign. Schober, the Police President of Vienna, formed a new cabinet in June, 1921. The threat of the Allies did not, however, prevent the people of Tirol on Apr. 24, 1921, nor those of Salzburg on May 29, from voting by overwhelming majorities in favor of union with Germany. The Austrian Assembly also voted to submit the question to a national plebiscite, but the Allies, particularly France, let it be known that they would prevent union with Germany, whatever the outcome of the plebiscite.

The movement was only partially dictated by economic necessity, for political desires and nationalist aspirations were important in it. The plebiscites held were, of course, ineffective except as indications of popular sentiment. The three-cornered controversy between Austria, Hungary, and the Allies regarding Burgenland (q.v.), a strip of western Hungary inhabited chiefly by Germans and ceded to Austria by the Treaties of St. Germain and the Trianon, was settled after long altercations and some violence by the assignment of most of the area to Austria and the return of a small portion, the Oedenburg, or Sopron, district, to Hungary, after a plebiscite held in that locality on Dec. 17, 1921, had shown its predominantly Hungarian sentiment.

The Schober cabinet was forced out of office in May, 1922, over a budget question. It was succeeded by a coalition cabinet under Dr. Ignaz Seipel, the leader of the Christian Socialists. The desperate situation of the country at this time made some sort of action imperative. Austria had either to procure international financial assistance or unite with one of three neighboring countries, Italy, Germany, or Czechoslovakia. Italy addressed a note to the countries concerned announcing that she would consider union with Germany or the Little Entente a *casus belli*. Thus, the only course open was to seek financial aid abroad. Toward this end, Chancellor Seipel appealed on Sept. 6, 1922, to the League of Nations. The latter adopted a plan for the restoration of Austrian finances, providing for an international loan of 650,000,000 gold crowns redeemable in 20 years, secured by Austrian productive assets and guaranteed by England, France, Italy, Belgium, Czechoslovakia, Spain, and Holland, and the creation of a commissioner general, appointed by the League to supervise Austrian expenditures. Moreover, a committee of control, consisting of one representative of each of the governments guaranteeing the loan, was to be set up. The guarantor states pledged themselves to respect Austrian sovereignty and independence, in return for which Austria agreed not to alienate her independence. This last clause was inserted in the agreement to prevent union with Germany. The plan also provided for certain governmental reforms to insure economy. On Nov. 26, 1922, the plan of the League was approved by the Austrian Parliament, the Christian Socialists and the Pan-Germans voting for it and the Socialists against it. The plan was put into operation immediately with Dr. Alfred Zimmermann of Rotterdam as commissioner general. The methods of drastic financial surgery which were applied brought about as early as the spring of 1923 the stabilization of the paper crown and a reduction of the deficit in the budget, although unemployment increased. This

increase was counteracted by an accompanying decrease in the cost of living and a revival of industry and trade which during the course of the year absorbed a great number of the government employees dismissed for reasons of economy. Slowly, Austria progressed toward financial stability and economic reconstruction.

By the close of 1923, Vienna was regaining her position as the commercial and exchange centre for the Danube Basin and Southern Europe, the budget deficit had been cut in half, savings had multiplied, the currency had been stabilized, industry had revived, and foreign capital was beginning to come into the country. Accompanying this economic recovery was a lessened interest in union with Germany, as shown by the October elections, and better relations with the Succession States. On Feb. 25, 1924, Austria resumed diplomatic relations with Russia, and on October 13 signed an agreement with Switzerland for a permanent board of conciliation. Negotiations were carried on with neighboring European countries for a reduction of their high tariff rates, which were considered as being largely responsible for Austria's economic distress, but met with indifferent success.

Various internal disorders marked the year 1924. Early in the year a severe banking crisis caused many failures and much suffering. On June 1, Chancellor Seipel was seriously wounded by an irresponsible Socialist. In September occurred a strike of 60,000 metal workers and in November, a strike of railway employees, the latter leading to the resignation of Chancellor Seipel. He was asked to form another cabinet but declined, recommending instead Dr. Rudolf Ramek, who formed a coalition ministry on November 20. On December 9, Dr. Michael Hainisch was reelected President for another term of four years.

While general economic conditions were discouraging, the country's finances continued to show steady improvement and, in the spring and summer of 1924, there began to appear evidences of a desire on the part of the Austrians to escape from the supervision of the League of Nations. The budget, however, had not yet been balanced and there were many points of disagreement between the Austrian government and the commissioner, Dr. Zimmermann, with regard to policies leading up to that objective. Dr. Zimmermann complained that Austria was holding back from assuming the burdens necessary for financial recovery, to which the reply was made that the wages of the working class were the lowest in Europe and the cost of living was higher than at any other time since the War. He also objected to the Government's action in raising the salaries of civil employees and thus bringing about a much larger deficit than the League had expected. A strong difference of opinion developed over the question of whether a balanced budget should be achieved by increasing the taxes, as the Austrians desired, or by decreasing expenditures. The "normal budget," or the figure of revenue and expenditures which was to be attained before financial reconstruction should be regarded as complete, had originally been set at 350,000,000 gold crowns. But it became evident that that figure was much too low, and at the instance of the Government the League Council, after an investigation by the commissioner and the Finance Committee, agreed in September, 1924, to a 1925 budget figure of 545,000,000 gold crowns for ex-

penditure, of which 50,000,000 crowns were to be for investments. The Government in return undertook to put through a number of reforms relating to taxes, currency, etc. It was slow in doing so, but by the middle of 1925 it had succeeded in bringing about one of the most important. This was an arrangement by which the financial authority of the central government over the provincial governments began to be clarified. By the end of 1928, such authority had been firmly established. This has been a source of much difficulty because of the recalcitrant attitude of the city and province of Vienna, which contained 60 per cent of the country's wealth and was more concerned with its own budget than with that of the country.

In the autumn of 1924, Parliament provided for a new silver currency, the monetary unit being the schilling, to be put in circulation July 1, 1925. This, with later legislation, practically put the country again on a gold basis. At the request of the Government the League of Nations in May, 1925, appointed two expert economists to examine the condition of Austrian economic affairs. Their report, presented to the League Council on September 10, was on the whole encouraging. Because of this favorable report and the continued progress of the country's financial recovery, the League decided to relinquish control of Austrian finances on July 1, 1926, if accounts still remained satisfactory. But it retained the right to resume control at any time within ten years if the balancing of the budget appeared to be endangered, and it also stipulated that the foreign advisor to the National Bank should remain for three years more. The year 1925 closed with a substantial surplus, the first time since the War, and the budget for the following year was balanced. Accordingly, on June 30, 1926, League control ended. The report of the commissioner showed that only a small part of the League's loan had been used to cover current deficits, and that otherwise also the experiment had been highly successful.

Throughout this period, however, the economic situation, while showing improvement, was still anything but happy, as attested among other things by continued strike movements and by the large number of unemployed. At the close of 1925, the unemployed numbered 250,000. Throughout 1925 a strike of the civil employees for higher wages impended. The Government finally granted them a small bonus. In November, 1925, a bakers' strike in Vienna caused much distress. These conditions, with other factors, led to revived agitation for the "anschluss" or union with Germany. At a large demonstration at Magdeburg in February, 1925, the Austrian Secretary of State and the President of the German Reichstag made speeches expressing hope for an early union. In May, a Cooperative Committee was formed in Vienna to work for this end and in August another great demonstration in Vienna showed the popularity of the idea. Italy and Czechoslovakia, however, voiced their opposition, as did also the Little Entente at a meeting in Bucharest, and the Government held off from taking action. The internal political situation continued troublesome, due to the ever-smouldering antagonism between the Conservatives and the Social Democrats. The former controlled the government of the country and the latter, by a wide margin, the government of Vienna.

In January, 1926, the Ramek cabinet resigned but was immediately reconstituted. In June, the announcement by Dr. Schneider, Minister of Education, of an educational programme which limited to Vienna the application of a law providing for the cessation of religious education in schools, led to his resignation and to a great anti-Government demonstration on June 18. The prestige of the Ramek government was greatly weakened in the summer of 1926 by a bank scandal. The Government had advanced \$9,000,000 to the Central Savings Bank to tide it over a run, and it was shown that Dr. Ramek and his party were politically involved in the transaction. This was the real cause which led to the resignation of the Ramek government on October 15, although the ostensible reason was a difficulty in connection with the demands of civil employees.

On October 20, Dr. Seipel again formed a Cabinet, supported by the Christian Socialists and the Pan-Germans. But the Socialist opposition was strong, and in the spring of 1927, when no agreement could be reached on the Government's old-age and invalid pensions measure, general elections were determined upon. These were held April 24 and resulted in a gain of three seats for the Socialists. But Dr. Seipel was able to form another coalition government on May 19. The elections did not allay the intensity of political feeling. On July 15, the social antagonism flamed out in a terrible riot in Vienna over the acquittal by a jury of three members of the Heimwehr, or irregular Austrian Fascists, for the death of two Socialists in the preceding January. Without authority from their leaders, tens of thousands of workers went on a strike, swarmed into the Ringstrasse, overcame the small force of police, and burned the Palace of Justice. The police, reinforced, fired on the mob, killing seventy and wounding hundreds. Several policemen also were killed. Civil war was narrowly averted and the inflamed feeling continued for many months, resulting now and then in open clashes.

Although Chancellor Seipel was supposed to look coldly on union with Germany, the favoring sentiment was so strong that he consented to seek economic union as a prelude to political union. In 1927 he held a conference with German industrialists, at which it was decided to appoint commissions to determine how Germany could assist Austria financially and industrially. The way also was paved for legal union. Parliament considered the creation of a common criminal code for the two countries and in the autumn of 1927 one of its committees met a committee from the German Reichstag to discuss the subject. In November, 1927, Chancellor Marx and Foreign Minister Stresemann visited Austria, but did not discuss the subject of union. In September of the following year, however, a Pan-German Jurists Congress opened at Salzburg with the German Minister of Justice and a large number of other German officials and jurists present, and the greatest enthusiasm for the union was expressed. Two months later, November 12, when the tenth anniversary of the Austrian Republic was celebrated, a Pan-German manifesto was issued endorsing the union and signed by hundreds of leading Austrians.

Aside from political matters, the country continued to show steady improvement. Tourist traffic showed gratifying gains and the advances made in extending hydroelectric installations

relieved the country from the necessity of importing great quantities of coal. Many treaties relating to trade, arbitration, etc., were signed, including an Austro-Czech treaty of arbitration, trade agreements with Hungary, Jugo-Slavia, etc., but the burdensome tariff restrictions for the most part refused to yield to diplomatic persuasion.

The most serious development in foreign relations at this time came to a head early in 1928. For some years, the resistance of the German population of South Tyrol, a former Austrian territory incorporated with Italy as a result of the War, to Mussolini's Italianization measures had roused the keen sympathy of the Germans of Austria and Germany. So strong did this feeling become that in February, 1928, Deputy Kolb and the Chancellor made moving speeches to the Austrian Parliament, the latter disclaiming intentions of diplomatic action but expressing deepest sympathy for the South Tyrol Germans. The Italian Minister at Vienna was recalled for conference by Mussolini, who on March 3 replied to Dr. Seipel in a vigorous address. Strained relations continued, but a conciliatory speech by Dr Seipel in July brought better feeling and led to a return of the Italian Minister. Later in the year, Mussolini ordered that the teaching of the scriptures by German-speaking clergy in South Tyrol to Austrian children in their own tongue should be permitted.

The course of internal politics ran anything but smoothly throughout 1928. At Feldkirch on March 23 occurred a clash between the Heimwehr and the Socialist Defense League in which several persons were wounded. At Wiener Neustadt, 30 miles from Vienna, the two organizations staged rival parades on October 7, bloodshed being prevented by the presence of large forces of government troops. Dr. Seipel refused to prohibit these demonstrations on the grounds that the parties had a right to the free expression of their beliefs. In December, the end of the second term of Dr. Hainisch as President made the selection of a new President necessary, the constitution forbidding the serving of more than two terms by one man. Chancellor Seipel tried to have the constitution amended to permit the third election of Dr. Hainisch, but when he was unsuccessful he supported Wilhelm Miklas, presiding officer of the Austrian Parliament, for the place. Over the opposition of the Socialists, Miklas was elected December 5 and installed in office December 10. He was reported to have strong Clerical leanings and to look with disfavor on union with Germany.

The year 1929 was early marked by evidences of intense political feeling. In a riot at Gloggnitz, near Vienna, on February 3, many were reported injured. On February 24, when a double parade by the Heimwehr and the Socialists occurred in Vienna, every precaution was taken to prevent a repetition of the bloody scenes of the 1927 riot. In February, 1929, Leopold Kunschak, leader of the Christian Socialists, made a statement expressing distrust of the Heimwehr and a fear that it might develop into a menace to parliamentary government, and announced the formation of a new defense organization. Chancellor Seipel, however, was reported as disapproving these sentiments.

Making use of her improved credit standing, Austria took steps to obtain financial assistance from abroad for further construction purposes and for the relief thereby of unemployment. In November, 1927, the City of Vienna floated



a \$30,000,000 loan through the National City Company of New York. In 1928 the Austrian government carried on negotiations to clear the way for a loan of 725,000,000 schillings (about \$100,000,000) chiefly for rebuilding, extending, and modernizing the country's railroad and telegraph and telephone systems. Before this loan could be offered, it was necessary to obtain from Austria's nine creditor nations and from the Reparation Commission waivers of the lien which they held on certain Austrian resources covering the \$120,000,000 relief loan of 1920 and the \$125,000,000 reconstruction loan of 1923. Such waivers were obtained from seven of the nine countries, including Denmark, France, Great Britain, the Netherlands, Norway, Sweden, and Switzerland. No final agreement was reached with the Reparation Commission, Italy, or the United States.

In the spring of 1928, the United States Treasury asked Congress for authorization to make such agreement and also to fund the original relief loan made by the United States to Austria (the principal of which was \$24,055,709) on terms which would insure the ultimate repayment of the entire principal with practically no interest. The bill passed the House of Representatives but failed to pass the Senate, to the keen disappointment of Austria. She concluded negotiations with the seven countries named, however, for the funding of the relief loan and made first payments, in accordance with the agreements, on January 1, 1929. At the session of Congress beginning in December, 1928, the United States Treasury renewed its request for authorization to make similar agreements and the bill was passed and became a law February 2, 1929. While Austria has made an initial payment (in January) under the debt-funding agreement, as she was required to do by the terms of the original bonds of the 1920 loan providing for equal treatment of all the creditor nations, the final settlement was held up pending an agreement between Austria and the Reparation Commission. On April 1, 1929, no such agreement had been reached and Italy and Austria likewise have failed to reach an agreement.

In 1929 it was thought that inherent in the economic situation in Austria there were possibilities for even a more complete come-back than is recorded by the facts of the previous two years. The area of agricultural land under cultivation had increased productivity for the principal bread-grains, potatoes, and other foodstuffs, including the dairy industry, anywhere from 100 to 500 per cent. The tourist trade had proved very profitable and efforts were being made to attract wealthy foreigners to enjoy the natural attractions of the Republic. Industrially and in the railroad situation, there is also evidence of considerable improvement. The exports of manufactured articles had increased impressively.

**AUTHORS' LEAGUE OF AMERICA, Inc.** An organization founded in 1912 to provide mutual assistance in the technicalities and difficulties of publishing and copyrighting. Membership was limited to persons of recognized standing in the literary or artistic professions. It is divided into four departments or guilds; The American Dramatists; the Authors' Guild; The Guild of Free Lance Artists; and the Screen Writers' Guild. Throughout the decade, the League supplied confidential information to its members regarding managers, producers, etc. In 1919 it launched a world-wide propaganda on

behalf of American literature to raise the standard of literary criticism and to secure for American books the attention due them. The constitution of the League was revised in 1920 in regard to membership, dues, and the formation of guilds. The League's plan to organize a council to bestow literary awards was announced in the inaugural address of the President, Arthur Train, in November, 1928. Arrangements were subsequently made with the New York Public Library to house a collection of signed first editions of League members. Presidents of the League have been: Winston Churchill, Rex Beach, Owen Davis, Jesse Lynch Williams, Ellis Parker Butler, and Arthur Train.

**AUTINTOXICATION.** See DIET.

**AUTOMATIC RIFLES.** See SMALL ARMS.

**AUTOMOBILES.** See MOTOR VEHICLES.

**AUTOMOBILE TIRES.** See MOTOR VEHICLES; RUBBER.

**AYLMER, SIR FENTON JOHN** (1862— ). A British general. He joined the army in 1880, gained distinction as an officer in Burma, India, and China, and in 1912 was made adjutant general at Simla. In 1915 he was promoted to the rank of lieutenant general and led the forces in Mesopotamia for the relief of Kut-el-Amara. The attack on the Turks failed; he was taken prisoner in April, 1916, and was exchanged in September. In the same year, he was made Knight Commander of the Bath. See WORLD WAR under *Turkish Front*.

**AYRES, LOUIS** (1874— ). An American architect, born at Bergen Point, N. J. He graduated from Rutgers College in 1896 and studied architecture in the offices of McKim, Mead & White, and York & Sawyer. In 1910 he went to York & Sawyer, prominent as the firm architects of the Guarantee Trust Company Building, Postal Life Building, Broadway Savings Bank, and Rockefeller Hospital in New York, and other noteworthy buildings in that city and elsewhere. He was appointed architect for the Federal Reserve Bank, the Bowery Savings Bank Building, the Greenwich Savings Bank, all in New York, the First National Bank in Boston, etc. He was a member of the Federal Fine Arts Commission, 1921-25.

**AZERBAIJAN, ā'zēr-bī-jān' SOCIALIST SOVIET REPUBLIC OF.** One of the three Transcaucasian republics, affiliated with the union of Socialist Soviet Republics that emerged in October, 1917; made up of the former Russian governments of Baku and Elisavetpol, and situated on the land bridge which links Asia with Europe. The Republic derives its name from the Persian Azerbaijan to which it belonged up to 1813, when Russia acquired it. Geographically, it lies in the basin of two great Caucasian rivers, the Kuru and the Aras, and is enclosed by the Caspian Sea, the Caucasus, and the highlands of Armenia and Persian Azerbaijan. Around its chief city, Baku, is to be found oil, and in this single fact lies the prominence of an otherwise unimportant state. Within its boundaries is an area of 32,950 square miles and a population in 1926 of 2,313,172. Seventy-five per cent of the people are Moslems of Tartar and Turk stock, and almost the whole of the remainder are Armenians. The few Russians and Europeans in the state are to be found in the Baku district.

**Industry.** The natives are a pastoral people. Cattle- and sheep-herding is their leading activity. Lack of communications and absence of a



real community life made for ignorance and superstition, and backwardness was further fostered by unfamiliarity with the Western world. The city of Baku, with an estimated population of 447,000, is the centre of great oil wells and before the War was the most prolific single district in the world and almost the only source of Russia's petroleum output. The production in 1927 was 625,500,000 pounds. Lines of communication and trade centred here, making Baku the focal point of the whole Transcaucasian isthmus. The city was in direct communication by rail and water with Europe and Asia, particularly because it was the eastern terminus of that Transcaucasian railway which ended in the west at Batumi, Georgia. Another tie that knitted the two cities together into a single economic unit was the pipe line that tapped the Baku oil fields. The separation of these two cities from 1917 to 1923 as a result of political upheavals was really the nucleus of the Transcaucasian problem. Besides the petroleum, some developments were made in Azerbaijan in cotton culture, stock-raising, silk, cereals, and fisheries.

**History.** The story of Azerbaijan is intimately connected with that of the Russian Republic. In March, 1917, the Russian Republic was established; in September, in concert with Georgia and Armenia, Azerbaijan set up an autonomous government for Transcaucasia. The seat of this Federal Republic was established at Tiflis and the Parliament, or, *seim*, of 132 members organized. The Republic had a brief and stormy career, for profound divergences of faith and sympathy impeded attempts at a mutual understanding. The Georgians and Armenians were Christians and looked to Europe for aid: the Tatars of Azerbaijan were Mussulmans and regarded Turkey as their natural ally. The invasion of Transcaucasia by Turkey in the spring of 1918 to secure the territories allotted it under the Brest-Litovsk Treaty of Mar. 3, 1918, caused serious dissension in the Republic, for the Azerbaijani refused to take arms against their kinsmen. Other forces of disintegration were also at work. A Bolshevik government had established itself at Baku, and aided by the Armenian traders in the city, succeeded in seriously hampering the activities of the Azerbaijan government set up provisionally at Elisavetpol. In March, 1918, the Tatar Moslems were compelled to flee from Baku as a result of serious disorders in which thousands were slain. On Mar. 17, 1918, an Azerbaijan attack on Baku was repulsed, compelling the Tartars to turn to their co-religionists, the Turks, for aid. This definite alliance with the Turks on the part of Azerbaijan brought about the fall of the Federal Republic, which was dissolved on May 26, 1918. Great Britain had watched all these movements with alarm. The victories of the Turks, together with the threat to the East that their advances implied, compelled the despatch of a British force to the aid of the Russians and Armenians beleaguered in Baku. But the counter-attack of the Turks could not be withstood; the British were compelled to take to their ships; and Baku fell on Sept. 14, 1918. The armistice of October 30 between Turkey and the Allies cleared Transcaucasia of Turkish troops, and a British division soon took possession. It seems to have been the intention of the British to maintain a permanent sphere of control in Transcaucasia. But this policy depended on French successes in the Ukraine, and when the French

met with hostility in Odessa and were compelled to withdraw, the British position in Transcaucasia was correspondingly weakened. During July and August, 1919, the British withdrew.

When the Peace Conference assembled early in 1919, Azerbaijan attempted to have its boundary question considered. This matter was compelled to wait on the completion of the Turkish treaty, and nothing was settled. In January, 1920, recognition was accorded by Great Britain to Azerbaijan and its sister republics, Armenia and Georgia. A little later, the three states exchanged treaties in which they promised to safeguard one another's independence and to permit unimpeded intercourse between Batumi and Baku. This show of external independence was brief. The defeat of Denikin and the understanding that was reached between the Russians and the Turkish Nationalists on Mar. 16, 1920, once more left unhindered the Russian advance into Transcaucasia. On Apr. 28, 1920, a Russian army entered Baku without opposition. A rising of local Bolsheviks turned out the Equality Party then in power and a Soviet government was established, patterned after and in complete sympathy with the Moscow government. Local disorders as a result of the concentration of Russian activities exclusively in Poland during the fall of 1920 caused much bloodshed. Bolshevik sympathizers were attacked by Tatars at Elisavetpol and Bolsheviks and Armenians retaliated with the massacre of some 15,000 Tatars of all ages. In September, 1920, Azerbaijan signed a series of treaties with Soviet Russia consenting to unification of the military organization, financial and economic control, and foreign relations of the two countries; Azerbaijan became a dependent state with a very restricted local autonomy. In the fall of 1920, the Russian Bolsheviks brought about the downfall of the national governments of Armenia and Georgia, and in the spring of 1921 soviet governments were set up in these countries. Once more Azerbaijan, Armenia, and Georgia were bound together in a federal republic of Transcaucasia, but the federation was now in vassalage to Soviet Russia. Thus, in effect, Russia was once more in control of her old Transcaucasian provinces and dominated their economic and political life as before the events of 1917. This influence was given the stamp of legality by the completion of the important treaty of Dec. 30, 1922 (see RUSSIA), at Moscow; all the Russian soviet republics were signatories to this. By it the governments of Russia, the Ukraine, White Russia, Georgia, Armenia, Azerbaijan, Bokhara, and Khiva, substituted for their bi-lateral treaties a federal state, called the Union of Socialist and Soviet Republics. Under the treaty, a centralized control for the army, navy, foreign affairs, trade, finances, economic resources and relations, etc., was established, and the Central Executive Committee for the Allies was at once created. This body comprised 270 representatives from Russia, 68 from the Ukraine, 7 from White Russia, and 26 from the Transcaucasian states. As far as Azerbaijan was concerned, the Union meant, economically, the establishment of relations once more with the port of Batumi, and politically, the definite passing of Azerbaijan as an independent state after a turbulent history of less than six years' duration. See RUSSIA.

**AZORIN** (1876- ). See MARTINEZ RUIZ, JOSÉ.

# B

**BABBITT, IRVING** (1865- ). An American scholar and critic, born at Dayton, Ohio (see Vol. II). In 1912 he became professor of French literature at Harvard University and between 1920 and 1923, he lectured at Kenyon College, Yale University, Stanford University, and the Sorbonne, Paris. His *Rousseau and Romanticism* (1919), one of the outstanding critical productions of the time, synthesized the attitude toward life and letters which he had expressed in previous works. His brilliant attack on the fetish of naturalism in science, philosophy, and literature, and his insistence on the classical formula of moderation and form, came with particular timeliness, when the romantic cult seemed to reach its apogee. In the United States, he was more persistently romanticist because of the absence of a humanistic tradition and also because of the firm entrenchment of pragmatism. Mr. Babbitt also published *Democracy and Leadership* (1924), besides occasional papers in reviews and other periodicals.

**BABCOCK, BERNIE** (SMADE) (1868- ). An American author, born at Unionville, Ohio. She was educated at Little Rock University, Arkansas, was a member of the staff of the *Arkansas Democrat* and later owned and edited *The Arkansas Sketch Book*, a quarterly, the first venture of its kind in her native State. She wrote *Mammy*, a drama read at Chautauqua and lyceum circuits. She is also the author of many historical works, including *The Daughter of a Patriot* (1900); *An Uncrowned Queen* (1902); *Yesterday and To-day in Arkansas* (1917); *The Soul of Ann Rutledge* (1919); *The Lincoln Love Story* (1919); *The Soul of Abe Lincoln* (1923); *When Love Was Bold* (1924); *Booth and The Spirit of Lincoln* (1925), and *Little Abe Lincoln* (1926).

**BABCOCK, SAMUEL GAVITT** (1851- ). American bishop in the Protestant Episcopal Church. He was born at Newport, R. I., and was graduated from the Episcopal Theological School at Cambridge, Mass., in 1891. He was ordained deacon in 1877 and priest in 1891. After holding pastorates in Rhode Island and Massachusetts, he became archdeacon of Massachusetts in 1903. He was elected bishop in 1913 and in 1915 received the degree of D.D. from Brown University.

**BABINSKI, JULES** (1855- ). A distinguished French neurologist, pupil and successor of Charcot. Born in Paris, he graduated in medicine from the university in 1885. He discovered several valuable diagnostic signs in connection with neurological practice; two of these are in daily use among neurologists. The so-called "great toe" or "first Babinski" reflex was described in 1896-97 and the "second toe sign" in 1903. He was Charcot's chief of clinic in the Salpêtrière and Pitié Hospitals, and during the World War, he had charge of many traumatic neurological cases at the latter institution. He

was professor of neurology in the University of Paris. Babinski has written over 200 papers on nervous affections. With Froment he published *Hystéropathisme en Neurologie de Guerre*, 1917. This work was translated into English by Sir H. Rolleston in 1918.

**BACHELIN, HENRI** (1879- ). A French novelist, born at Lormes (Nièvre), France, who was especially noted for his novels describing Morvan, the section of France with which he was best acquainted. In 1918 he was awarded the *Vie Heureuse* Prize. His works include *Pas comme les autres* (1906), *Les Manigants* (1907), *Horizons et coins du Morvan* (1909), *Jules Renard et son œuvre* (1909), *Robes noires* (1910), *Juliette la jolie* (1912), *Sous d'humbles toits*, short stories (1913), *L'héritage* (1914), *La renaissance du livre* (1917), *L'Éclaircie* (1918), *Le serviteur* (1918), *Les Rustres* (1922), *Le chant du coq* (1922-23), *La cornemuse de Saulieu* (1925), *La Vénus rustique* (1926), and *La maison d'Anniké* (1927). Consult *Le roman nouveau*, by Jules Bertaut (1920).

**BACHELLER, IRVING** (ADDISON) (1859- ). An American author, born at Pierrepont, N. Y. (see Vol. II). He published *Marryers* (1914); *The Light in the Clearing* (1917); *Keeping Up with William* (1918); *A Man for the Ages* (1919); *The Prodigal Village* (1920); *In the Days of Poor Richard* (1922); *The Scudders* (1923); *Father Abraham* (1925); *Dawn—A Lost Romance of the Time of Christ* (1927); *Coming Up the Road* (1928), and *The House of the Three Ganders* (1928).

**BACON, FRANK** (1864-1922). An American actor, born at Marysville, Calif. He was educated in the public schools of San José, Calif., and made his first appearance on the stage at the Garden Theatre, San José, in 1890, in the melodrama, *Ten Nights in a Bar-Room*. He was for 17 years a member of a stock company in San Francisco. He played in New York in *Alabama*, *Pudd'n' Head Wilson*, *Me and Grant*, *The Cinderella Man*, *The Fortune Hunter*, etc. His most popular play was *Lightnin'*, written by himself in collaboration with Winchell Smith and produced with extraordinary success for three consecutive years in New York, beginning in 1918. He appeared in the leading rôle more than two thousand times.

**BACON, RAYMOND FOSS** (1880- ). An American chemical engineer, born at Muncie, Ind. He was graduated in 1899 at DePaul University. From 1905 to 1910 he was chemist in the United States Bureau of Science at Manila, and in 1910-11 with the Bureau of Chemistry in Washington, D. C. He held a petroleum fellowship at the University of Pittsburgh, 1911-12, and then until 1921 he was connected with the Mellon Institute of Industrial Research in Pittsburgh, first as associate director, 1912-14, and then as director, 1914-21. He was active in the World War as colonel in the Chemical Warfare Service, serving nine months in France as chief of the technical division of the Service.

He received the degree of D.Sc. from the University of Pittsburgh in 1918 and from DePauw University in 1919. In October, 1921, he began practice in New York as a consulting chemical engineer. Colonel Bacon received the Distinguished Service Medal in 1922. He became a member of several American and foreign societies of chemists and invented processes for the manufacture of gasoline, the recovery of cuprous sulphide from ores, and the hydrogenation of vegetable oils. He wrote: (With W. A. Hamor) *American Petroleum Industry* (2 vols.) and published also *American Fuels* (2 vols.) and numerous papers and reports on chemistry.

**BACON, MRS. SELDEN.** See **DASKAM, JOSEPHINE DODGE.**

**BADEN, FREE STATE OF.** Formerly a grand duchy, now a republic, in southwestern Germany. Its area is 5819 square miles; its population in 1925 (census), 2,312,462 (the 1910 census gave Baden, 2,142,833). The capital, Karlsruhe, had, according to the census of 1925, 145,694. The largest cities include: Mannheim (247,486), Freiburg (90,475), Heidelberg (73,034), and Pforzheim, (78,859). No important changes have appeared in the activities of the population. Wheat, barley, rye, tobacco, hemp, and various root crops are cultivated. The vine culture yielded 6,488,232 gallons of wine in 1926. The manufactures include tiles, cigars, jewelry, machinery, musical instruments, chemicals, hats, paper, leather, and brushes.

Up to the revolution of 1918, Baden was ruled by a hereditary monarch, the Grand Duke, with the aid of an election diet. The country, because of an alliance of the Liberal parties and the Social Democrats, and also because of its long liberal tradition, was regarded as one of the most happily administered in all Europe. But the downfall of the Hohenzollern family dragged with it the reigning house of Baden and the Grand Duke abdicated on Nov. 22, 1918. On Jan. 15, 1919, a national assembly, which had been elected on a basis of universal suffrage, met for the preparation of a new constitution. On May 21, 1919, the new constitution was promulgated, the first such document to emerge in revolutionary Germany. It abolished all privilege of birth, religion, and caste; bestowed full legal rights on women; recognized the right of workers, including civil servants, to combine; and granted the suffrage to all men and women over 20. The sovereign power has been vested in a single-chamber Diet (Landtag), which chooses the ministry of four and, from their number, one to act as minister-president and president of the state. Through the exercise of the initiative, the Diet may be dissolved at any time. Baden is a member of the German Federated Republic or Reich and has three members in the Reichsrat, or Imperial Council.

**BAEKKELAND, bā'ke-lānd or bā', LEO HENDRIK** (1863- ). A Belgian-American chemist (see Vol. II), honorary professor of chemical engineering at Columbia University. In 1914 he was awarded the first Chandler Medal by Columbia University, in 1915 the Grand Prize at the Panama-Pacific Exposition, and in 1916 the Perkin Medal for industrial chemical research. He was appointed to the Naval Consulting Board in 1915, was president of the American Chemical Society in 1924, and has been decorated by France and Belgium.

**BAFFIN ISLAND.** A large island in the Canadian Arctic Archipelago extending from

61° 30' to 74° North Latitude and occupying about 211,000 square miles. The natives, numbering over 1000, are largely concentrated about whaling stations on the east and south coasts. Because contact with the outside has led to radical changes in the Eskimo culture, the Canadian government has recently established stations of the Royal Canadian Mounted Police at Ponds Inlet, Lake Harbor, and Pangnirtung. In addition to overseeing the natives, the Police make exploratory patrols. The government steamship, *Beothic*, makes an annual inspection trip to these Eskimo settlements. Burwash in 1923-24 and Soper in 1924-26 studied the physical and economic aspects of the country for the Canadian government. MacMillan spent the winter of 1921-22 in southern Baffin Island. The Putnam Expedition of 1927 made extensive corrections in maps of the northern coast of Foxe Land reducing its extent by about 5000 square miles.

**BAGDAD.** See **IRAQ; WORLD WAR.**

**BAGLEY, WILLIAM C (HANDLER)** (1874- ). American educator and historian, born at Detroit, Mich. He was educated at the Michigan Agricultural College, the University of Wisconsin, and Cornell University. He taught in the public schools and was professor of education at the University of Illinois (1908-17) and at Teachers College, Columbia University, after 1917. He was president of the National Society for Study of Education and the Society of College Teachers of Education. During the World War, he edited *The National School Service for the Committee on Public Information*. He received the degree of Ed.D. from the Rhode Island State College in 1919. Among his published books are *The Educative Process* (1905); *Classroom Management* (1907); *Craftsmanship in Teaching* (1911); *Educational Values* (1911); (with S. S. Colvin) *Human Behavior* (1913); *School Discipline* (1915); (with C. A. Beard) *History of the American People* (1918); (with W. S. Learned) *The Preparation of Teachers* (1919); (with J. A. H. Keith) *The Nation and the Schools* (1920); (with C. A. Beard) *A First Book in American History* (1920); (with C. A. Beard) *Our Old World Background* (1922); (with J. A. H. Keith) *An Introduction to Teaching* (1924); *Determinism in Education* (1925); and (with G. C. Kyte) *The California Curriculum Study* (1926).

**BAHAMAS.** A British colony north of the West Indies consisting of 29 islands, 661 islets, and over 3000 reefs. Only 20 islands of this whole group are inhabited. The principal islands are New Providence, which contains the capital, Nassau (12,975); Abaco (3993); Grand Bahama (1695); San Salvador (686); Long Island (4659); Eleuthra (6048); Exuma (3730); and Andros Island (6976). The estimated total population in 1928 was 59,294. The planting of sisal, the growing of vegetables, and the sponge fisheries are the leading industries, while fruit culture increased rapidly because of the establishment of canning factories. The imports for 1927 were valued at £1,844,932 and the exports at £483,773. In 1927, 678,482 tons of shipping entered, and 675,942 tons cleared, the ports of the islands. In 1926 the share of the United States in Bahamas imports was 44 per cent and of their exports, 43 per cent, carried for the most part in American bottoms. Government revenues for the fiscal year ended March 31, 1928 were £485,319 and expenditures £673,986. On

March 31, 1927 the public debt was £154,105, and assets exceeded liabilities by £1,052,312. A large proportion of the illicit alcoholic traffic carried on with the United States originates in the Bahamas, the city of Nassau devoting itself to a large extent to this activity.

**BAHREIN** bá-rēn'. See ARABIA.

**BAIKO**, ONOYE (?-). A Japanese actor of the Imperial Theatre in Tokyo whose delicacy and charm as an interpreter of female rôles won him great favor. He was a member of the company which presented classical *Kabuki* drama.

**BAILEY**, BENJAMIN FRANKLIN (1875-). An American electrical engineer and educator, born at Sheridan, Mich. He studied electrical engineering at the University of Michigan, graduating in 1898, and after employment as a designer (1898) by the Edison Illuminating Company of Detroit, and in the testing laboratory of the General Electric Company, Schenectady, N. Y. (1898-99), he became successively an instructor in electrotherapeutics, instructor in electrical engineering, assistant professor, junior professor, and professor of electrical engineering at the University of Michigan, holding the last-named chair since 1913. He has been chief engineer and consulting engineer of the Fairbanks-Morse Electrical Manufacturing Company, and an engineer and official of other companies. He invented the Bailey electric lighting, starting, and ignition system. He wrote: *Induction Coils* (1903); *Induction Motors* (1911); *Elementary Electrical Engineering* (1913); *Principles of Dynamo Electric Machinery* (1915).

**BAILEY**, CAROLYN SHERWIN (1875-). An American author of children's stories, born at Hoosick Falls, N. Y. She graduated from Teachers College, Columbia University, in 1896. She has contributed to magazines and has published many volumes of stories for children, methods of story telling, methods of teaching children, etc. Her books include *The Peter Newell Mother Goose* (1905); *The Jungle Primer* (1906); *For the Story Teller* (1910); *Stories Children Need* (1915); *Boys and Girls of Colonial Days* (1917); *Broad Stripes and Bright Stars* (1919); *Flint*; *The Story of a Trail* (1922); *Friendly Tales, a Community Story Book* (1923); *Boys and Girls of Pioneer Days* (1924); *In the Animal World* (1924), and *Boys and Girls of Discovery Days* (1926).

**BAILEY**, CHARLES JUSTIN (1859-). An American soldier, born in Tamaqua, Pa. He was graduated from the United States Military Academy in 1880. He served in the artillery and coast artillery and was promoted through the various grades, becoming colonel in 1911 and brigadier general in 1913. On Aug. 5, 1917, he was commissioned major general in the National Army. He commanded the Philippine Department in 1918, and in the same year was made commander of the 81st Division of the National Army, with which he was in France in 1918-19. In the latter year, he was appointed commander of the Middle Atlantic Coast Artillery District, and in 1921 (in which year he became a major general in the regular army) commander of the Third Corps Area. He was awarded the American Distinguished Service Medal, the Order of Leopold (Belgium), the Croix de Guerre with palm (France), and was made an officer of the French Legion of Honor. He studied at the University of Vermont (M.A., 1898) and St. John's College bestowed the de-

gree of LL.D. on him in 1922. He was retired in 1923 at his own request, after forty years' service.

**BAILEY**, LIBERTY HYDE (1858-). An American horticulturist (see VOL. II). In 1926 he was president of the Botanical Society of America. The George Robert White Medal was awarded to him in 1927. He is the author of *Holy Earth* (1917); *School-Book of Farming* (1920); *Apple Tree* (1922); *Seven Stars*; *Universal Service*; *What is Democracy?*; and *Wind and Weather* (all in 1923); *Manual of Cultivated Plants* (1924); *Manual of Gardening* (1925); *Harvest of the Year* (1927); and *The Garden Lover* (1928).

**BAILEY**, PEARCE (1865-1922). An American neurologist and psychiatrist, educated at Princeton and Columbia universities. He became a consultant in several New York hospitals and with Collins and Fraenkel founded the Neurological Institute in that city. On the entry of the United States into the World War, he was appointed chief of the division of neurology and psychiatry in the United States Army, with the rank of colonel. He perfected a system for weeding out defectives. He made a translation of Golobievski's *Atlas and Epitome of Diseases Caused by Accident* (1900) and wrote *Diseases of the Nervous System Resulting from Accident and Injury*.

**BAILEY**, VERNON HOWE (1874-). An American artist, born at Camden, N. J. He studied at the Pennsylvania Museum School of Art and the Pennsylvania Academy of Fine Arts, and in London and Paris. Mr. Bailey's special subject is city streets in Europe and America. The best known of his drawings are his sketches in pencil of London. He is represented in many American galleries. Bailey was the first artist privileged by the United States government on the declaration of war in 1917 to make drawings of navy yards, munition factories, and other centres of war work. These drawings appeared in exhibitions and were published in leading magazines throughout the country. The Hispanic Society has a collection of 150 drawings which Mr. Bailey made of Spain, the Musée de la Guerre of France, a collection of lithographs of American war subjects, and the National Gallery in Washington, D. C., a collection of 80 war drawings. Besides working as a newspaper artist in London and America, Mr. Bailey illustrated many magazines and books. He exhibited 41 lithographs of New York skyscrapers in New York and London in 1927.

**BAIN**, H (ABBY) FOSTER (1872-). An American geologist and mining engineer, born at Seymour, Ind. He was educated at Moores Hill College (1890), Johns Hopkins University (1891-93), and the University of Chicago (1897). In the meantime, he became connected with the Iowa Geological Survey, in 1893, and remained with it until 1900; for three years he managed mines in Colorado, then he entered the service of the United States Geological Survey, with which he remained for three years. He lectured on economic geology at the University of Iowa in 1897 and at the University of Chicago, 1903-04. From 1905 to 1909, he was director of the Illinois Geological Survey. He was editor of the *Mining and Scientific Press*, 1909-15, and in 1915-16 edited the *Mining Magazine of London*, in the same years serving as a member of the Commission for Relief in Belgium. He was engaged in explorations in the Far East

in 1910-17 and in 1919-20. In 1918 he became assistant director of the U. S. Bureau of Mines and in 1921 succeeded to the directorship, which he held until 1924. He was a consulting engineer in Argentina in 1924-25, and in the latter year became secretary of the American Society of Mining and Metallurgical Engineers. He is a member of various societies of engineers.

**BAINBRIDGE, WILLIAM SEAMAN** (1870- ). An American surgeon and gynecologist, born at Providence, R. I. He studied at the College of Physicians and Surgeons of Columbia University and at various hospitals in New York City and abroad. He has been a prolific writer on surgical subjects in many fields, notably intestinal stasis and cancer. He held appointments in many hospitals and became a professor at the New York Polyclinic Medical School and Hospital in 1906. Before the entry of the United States into the World War, he was United States medical observer with the Allied armies in the field and later was attached to the Surgeon General's office to report his findings. After the entry of the United States into the War, he served as naval surgeon on vessels and at naval base hospitals and was subsequently appointed consulting surgeon of the Third Naval District. Dr. Bainbridge received honorary degrees from Shurtleff College, Washington and Jefferson College, the Western University of Pennsylvania, Lincoln Memorial University, and Coe College, and his work in the War was rewarded by decorations by France, Belgium, and Italy, as well as by the award of the New York State Conspicuous Service Cross. He is a member of many American and foreign medical societies and has been a delegate from the United States to several international medical congresses. His books are *A Compend of Operative Gynecology* (1906); *Life's Day Guide-Posts and Danger Signals in Health* (1909); *The Cancer Problem* (1914; two French editions and a Spanish edition, 1924); *Report on the Medical and Surgical Developments of the War*; *Report on Le Congrès Internationale de médecine et de pharmacie militaire* (1922), on the second international congress (1923), and on the third international congress (1925).

**BAIRNFATHER, BRUCE** (1887- ). An English humorist born at Murree, India, and educated at the United Service College, Westward Ho. He studied to be an engineer, but his experiences in the World War turned him into a humorous artist. His black-and-white sketches of life in the trenches, where he served with the Royal Warwickshire Regiment, which appeared in *Bystander*, made Bairnfather's reputation. His successful play *The Better 'Ole* was based on the adventures of the "Old Bill" of these sketches. He published several sets of war drawings and in 1919 started *Fragments*, a weekly comic paper.

**BAKER, GEORGE BARR** (1870- ). An American editor, born at Wyandotte, Mich. He began as reporter on the *Detroit Tribune* (1895-96) and was subsequently art critic, foreign correspondent, etc., for various newspapers and magazines. He was American correspondent of the *London Daily Express*, 1904-05, and secretary to Joseph Pulitzer, 1906. Later, he was associate editor of *Everybody's Magazine* (1907-10) and literary editor of the *Delineator* (1911-14). Through the Spanish-American War, he was ship's writer for the U.S.S. *Yosemite* and, during the World War, he was a member of

the Commission for Relief in Belgium, director of the American Relief Administration, a commander in the United States Naval Reserve Force, and held other important offices.

For his war work, he was made an officer of the Order of the Crown of Belgium, and a member of the Order of the White Rose of Finland and of the Order of Polonia Restituta of Poland. He wrote, in collaboration, *Mother's Geese*; a *New Brood* (New York, 1906).

**BAKER, GEORGE F(ISHER)** (1840- ). An American banker, born at Troy, N. Y. When the First National Bank of New York City was organized in 1863 under the Federal Banking Law, he was its cashier. He was president from 1867 to 1909, when he became chairman of the board. He has for a long period been a director in numerous corporations. He has given liberally to Cornell University and Harvard University, and to the Metropolitan Museum of Art.

**BAKER, GEORGE PIERCE** (1860- ). An American author and educator (see Vol. II). In 1924 he resigned as professor of English at Harvard University, where as director of "The 47 Workshop" he had carried on active instruction in dramatic composition and playwriting. In 1925 he became professor of the history and technique of the drama in the newly organized department of the drama at Yale and director of the University Theatre there donated by Edward S. Harkness, which was formally opened Dec. 10, 1926. He was author and director of the "Pilgrim Spirit," Massachusetts tercentenary pageant given at Plymouth in 1921, and wrote *Dramatic Technique* (1919).

**BAKER, SIR HERBERT** (1862- ). An English architect, who, after attending Tonbridge School, was articled to Arthur Baker, and later served as assistant to Sir E. George and Peto. He also attended the Royal Academy Schools, receiving the Aspinall Prize, and becoming a fellow of the Royal Institute of British Architects. He established a practice in South Africa in 1892, where he designed a number of important buildings, including the Groote Schuur for Cecil Rhodes; the Government House at Pretoria; the cathedrals at Capetown, and at Salisbury, Rhodesia; and the Rhodes Memorial on Table Mountain, Capetown. Sir Herbert also practiced in London. He was appointed, with Sir E. L. Lutyens, to build the new capital at Delhi, British India. He was elected an associate of the Royal Academy in 1922, was knighted in 1926, and received the gold medal of the Royal Academy in 1927.

**BAKER, HUGH POTTER** (1878- ). An American forester, born at St. Croix Falls, Wis. He studied at Macalester College, St. Paul, Minn., 1894-95, was graduated from the Michigan Agricultural College in 1901, and took post-graduate courses in forestry at Yale. He also studied economics at the University of Munich. For 10 years he was in the United States Forest Service in Idaho, Wyoming, New Mexico, and other Western States. He became professor of forestry at the Iowa State College in 1904 and filled the same chair at Pennsylvania State College, 1907-12. He was dean and professor of silviculture of the New York State College of Forestry, 1912-20, and executive secretary of the American Paper and Pulp Association (1920-28). In 1928 he joined the staff of the Chamber of Commerce of the United States. During the World War, he served with the 46th Infantry.



**BAKER, (MRS.) KARLE WILSON** (1878- ). An American author, born at Little Rock, Ark., and educated at the University of Chicago. In spite of the frequent mordant bits, her poems have visions of real beauty. Under the pseudonym of "Charlotte Wilson," she was co-author of *Women and Prisons* (1912), published in London by the Fabian Society. She has contributed fiction and poetry to various magazines and is the author of *Blue Smoke* (poems, 1919); *The Garden of the Plynck* (stories for children, 1920); *The Burning Bush* (poems, 1922), and *Old Coins* (prose tales, 1923). In 1925 she published *The Texas Flag Primer*, adopted by the Texas State Textbook Commission. Mrs. Baker received the degree of Litt.D. from the Southern Methodist University in 1924. In 1925-26 she was acting professor of English at the Stephen F. Austin State Teachers' College, at Nacogdoches, Tex., and became associate professor in 1927.

**BAKER, NEWTON DIEHL** (1871- ). An American lawyer and public official, born in Martinsburg, W. Va. He graduated from Johns Hopkins University in 1892 and from the law department of Washington and Lee University in 1894. He served as private secretary to Postmaster General Wilson, 1896-97, and in the latter year began the practice of law at Martinsburg, W. Va. He removed to Cleveland, Ohio, and from 1902 to 1912 was city solicitor. He was elected mayor in 1912 and was reelected in 1914. His work as an efficient administrative officer attracted wide attention and in 1916 he was appointed Secretary of War by President Wilson. He was in charge of this branch of the Government during the World War, and his conduct of the office was marked by zeal and by devotion to its duties. He served until Mar. 4, 1921. In that year, he was commissioned colonel of the Officers' Reserve Corps. In 1928 he received the Distinguished Service Medal. At the conclusion of his official service, he resumed the practice of law in Cleveland. He is a director of the Cleveland Trust Company and of the Baltimore & Ohio Railroad. He was a zealous advocate of the League of Nations, and at the Democratic National Convention of 1924 he made a strong but unsuccessful appeal for the inclusion in the platform of a plank favoring the League. In 1928 he was appointed by President Coolidge a member of the Hague Court for International Justice, succeeding Oscar S. Straus, who had died. In May, 1929, he was appointed a member of President Hoover's National Law Enforcement Commission.

**BAKER, (PERCY) BRYANT** (1881- ). An English sculptor, born at London. He studied at the London Royal Academy of Arts. Baker came to the United States in 1916 and served in the American Army (1918-19). His work included a statue of King Edward VII at Huddersfield, Yorkshire; a memorial to Archdeacon Henry Robeson in Tewkesbury Abbey; the Rt. Hon. Percy Illingworth Memorial in London; a marble bust of King Edward VII, executed for Queen Alexandra; and a portrait of Prince Olav, for the Queen of Norway. An idealistic imagination is evident in his "Eros" (Manchester) and "Mnemosyne" (Hull City Art Galleries). He made portrait busts of President Wilson, Gen. J. J. Pershing, Chief Justice William H. Taft, Theodore Roosevelt, and Calvin Coolidge. His work has been exhibited at the Royal Academy, London, the Paris Salon, the Corcoran

Art Gallery in Washington, and at various important galleries in the United States. He won the Marland Competition for the Pioneer Woman Statue at Ponca, Oklahoma.

**BAKER, PHILIP J. NOEL** (1889- ). A British university professor and member of Parliament. He attended Haverford College, U. S. A., and later went to King's College, Cambridge, where he received numerous scholastic honors. He was appointed vice principal of Ruskin College, Oxford, in 1914. During the World War, he served with the ambulance unit in France and Italy, receiving several decorations. At the Peace Conference he served on the League of Nations Section of the British delegation, and until 1922 he was affiliated with the League secretariat. In 1924 Baker was appointed Sir Ernest Cassel professor of international relations at the University of London. With the Labor majority in the election of May, 1929, he was sent to Parliament from the Coventry division. He wrote *The Geneva Protocol* (1925); *Disarmament* (1926); *The League of Nations at Work* (1926); *Disarmament and the Coolidge Conference* (1927); and, with E. B. Baker, J. Allen Baker, M.P., a *Memoir*.

**BAKER, RAY STANNARD** (1870- ). An American author and publicist, born at Lansing, Mich. (see Vol. II). After the World War, in which he served as special commissioner of the United States Department of State, in Great Britain, France, and Italy, Mr. Baker was prominent as director of the press bureau of the American peace delegation in Paris. Continuing his prolific writing, he published books in many genres. Under the pen-name of "David Grayson," he had written a series of rural studies which in their idyllic charm struck a rather unusual note in American literature. These sketches included *Adventures in Contentment* (1907), *Adventures in Friendship* (1910), *The Friendly Road* (1913), *Great Possessions* (1917), and the novel *Hempfield* (1915). These were followed in 1925 by *Adventures in Understanding*, in the same vein. In 1920 appeared *The New Industrial Unrest*, under his own name. As a result of his activities in Paris, he wrote *What Wilson Did at Paris* (1919), and *Woodrow Wilson and World Settlement* (3 vols., 1922). The latter was a full account accompanied by official documents, and had as its purpose the vindication of President Wilson's attitude. In 1925-26 appeared, in six volumes, *The Public Papers of Woodrow Wilson*, which Mr. Baker edited with Prof. William E. Dodd. Michigan State College conferred on Mr. Baker the degree of LL.D. in 1917, and Amherst College that of Litt.D. in 1925.

**BAKU, BAKOV**. See AZERBAIJAN.

**BALCH, EDWIN SWIFT** (1858-1927). An American author. He was born at Philadelphia and graduated from Harvard University, 1878. He was admitted to the Philadelphia bar in 1882. Besides contributing papers to the proceedings of several scientific societies of which he was a member, he wrote: *Antarctica* (1902), *Comparative Art* (1906); *The North Pole and Bradley Land* (1913), *Mount McKinley and Mountain Climbers' Proofs* (1914), *Elsie Willing Balch in Memoriam*, (1917); (with his wife, Eugenia Macfarlane Balch) *Art and Man* (1918); *Arts of the World* (1920).

**BALDWIN, JAMES MARK** (1861- ). An American philosopher and psychologist, born at Columbia, S. C. (see Vol. II). He remained at the National University of Mexico as professor



of philosophy and psychology from 1909 to 1913. During the World War, before the entry of the United States, he was an active advocate of American participation on the side of the Allies and delivered and published addresses pleading for intervention. *American Neutrality, Its Cause and Cure* (1916) and *France and the War* (1916) are collections of such addresses. In 1915 Professor Baldwin was Harvard lecturer at the provincial French universities and in 1915-16 was Herbert Spencer lecturer at Oxford University; in the latter year he published *The Superstate and the Eternal Values*, the Spencer memorial lectures. In 1918 he became lecturer, and in 1919 professor, at *L'École des Hautes Études Sociales*, Paris. A *Genetic Theory of Reality*, presented as the culmination of his previous studies in genetic logic, was published in 1915. Besides that work, he published *Paroles de Guerre* (1919), and *Between Two Wars—Memories and Opinions* (3 vols., 1926). To Professor Baldwin's numerous honors were added those of election as foreign correspondent of the Institut de France, in 1910, membership in the Japanese Academy of Social Sciences, 1913, and membership in the Royal Academy of Science of Belgrade, 1918. In 1917 he was decorated by the President of France, in person, with the cross of the Legion of Honor, and in 1918 he received the order of St. Saba of Serbia, with the rank of commander.

**BALDWIN, LEWIS WARRINGTON** (1875– ). An American railway official, born at Waterbury, Md., and educated at St. John's College, Annapolis, Md. (1893), and at Lehigh University (1896). He began his career in the engineering department of the Illinois Central Railroad in 1896. From 1906 to 1915 he held various positions with the Illinois Central and Yazoo & Missouri Valley Railways, finally becoming their general superintendent. He was successively general manager and vice president of the Central of Georgia Railway, 1915-18, and in 1918 he became assistant regional director of the United States Railroad Administration for the Southern region. He held a similar position in the Allegheny region, 1918-19, and became director in 1919-20. In the latter year he was also made vice president in charge of the operating department of the Illinois Central Railroad. In 1923 he became president of the Missouri Pacific Railroad.

**BALDWIN, RT. HON. STANLEY** (1867– ). A Prime Minister of Great Britain who was educated at Harrow and Trinity College, Cambridge. He entered public life by contesting Kidderminster in 1906 as a Unionist, and in 1908 was elected to Parliament from the Bewdley division of Worcestershire. At first, business absorbed most of his attention, but, once started on an active political career, his rise was rapid. He was Financial Secretary of the Treasury (1917-21), President of the Board of Trade (1921-22), and Chancellor of the Exchequer (1922-23). In the latter position, he went to the United States in January, 1923, with the British Financial Mission which funded the British war debt. On the resignation of Bonar Law, May, 1923, Baldwin took his place as premier. He believed in tariff protection as a remedy for unemployment, but he was bound by his late chief's pledge to let tariff reform alone. After a little over six months in office, he appealed to the country on the protection issue and, as the election resulted in the Labor and Liberal parties combined out-

numbering the Conservatives, he resigned in January, 1924. Ramsay MacDonald, heading the Labor government which followed, remained in office only until November, 1924, when a new election was called. The Conservatives, who did not then espouse protection, were successful, and Baldwin again became Prime Minister and First Lord of the Treasury. His "New Conservatism," more liberal in regard to social legislation than the old, among other things advocated conciliatory methods toward the working classes. In 1925 he defeated the Conservative proposal for the alteration of the trade-union-levee law, which would have lessened the funds of the Labor Party, because he did not wish to start a struggle with the trade unions. In 1926 during the general strike of May 3 which grew out of the coal strike of May 1, the country as a whole rallied to the support of the government, and the general strike was called off May 12. The miners, however, remained out until November, when lack of funds forced them back with no real gains and great injury to the country. In October, he presided over the Imperial Conference, at which the trend was toward greater autonomy of the dominions and preferential tariff rates among the members of the Empire. His support of the Trade Union Bill of 1927, which made another general strike virtually impossible, represented a return to the old Conservatism. In the same year he visited Canada on her sixteenth anniversary as a dominion, the first premier to visit an overseas dominion while in office. He resigned as Prime Minister in June, 1929, following a Labor victory in a general election. Mr. MacDonald again succeeded him. He published *Peace and Goodwill in Industry* (1925), *The Classics and the Plain Man* (1926), *On England and Other Addresses* (1926), and *Our Inheritance*, another selection of speeches (1928). See GREAT BRITAIN.

**BALDWIN, THOMAS SCOTT** (1854-1923). An American aeronaut, born in Merriem County, Mo. His flying experience extended over a 46-year period from 1875 to 1921. He was credited with being the first to descend from a balloon by means of a parachute (at San Francisco in 1885). He operated a balloon at the St. Louis Exposition, in 1904, and in 1908 he built the first airship for the signal corps of the United States Army. During the World War, he held the rank of major in the aviation corps and was chief of army balloon production and inspection.

**BALFOUR, SIR ARTHUR** (1873– ). An English business man and public official, born in London. He attended Ashville College, Harrogate. He has been connected with numerous business enterprises and government commissions. In 1923 he served on the Board of Trade Advisory Council, the Department of Overseas Trade Advisory Council, and the National Debt Commission, and as president of the Association of British Chambers of Commerce; in 1924 as chairman of the Government Committee on Industry and Trade. He was created a Knight Commander of the Order of the British Empire in 1923, and a baronet in 1929. He wrote, *Hints to the Practical Users of Tool-Steel*.

**BALFOUR, bāl'fōr or bāl'fār, ARTHUR JAMES, FIRST EARL OF** (1848– ). A British statesman and former prime minister (see VOL. II). With other Unionist leaders, he discarded all party differences on the outbreak of the World War and joined Mr. Asquith's first Coal-

tion cabinet of 1915 with the portfolio of First Lord of the Admiralty. In this office, his work met the uncompromising criticism of Winston Churchill, whom he had displaced, but his dignified deportment and excellent reports earned public confidence. In his administration, the battle of Jutland was fought; he was responsible for the appointment of Sir John Jellicoe as First Sea Lord and Sir David Beatty as commander of the sea forces. With the accession of Lloyd George in December, 1916, Mr. Balfour was transferred to the Foreign Office, where it was felt that his pleasing address could be of greatest aid in gaining the sympathies of the United States. In 1917 he came to the United States as the head of the British Mission and served as an important element in fusing the purposes of the two nations. In the same year, his statement to the effect that Great Britain would support the creation of Palestine as a homeland for the Jews attracted the support of Jewry the world over and was regarded as proof of English sincerity in championing the cause of small nations. In the years that followed, Mr. Balfour accepted comparatively unimportant posts cheerfully. He attended the Peace Conference as a British representative. In 1919 he resigned his Foreign Secretaryship to accept the less significant post of First President of the Council. In 1920 he represented his country at the first Assembly of the League of Nations, and in 1921 he once more came to America as his government's spokesman at the Washington Disarmament Conference. In 1923 he served on the National Debt Commission and in 1924 he was Chairman of the Government Committee on Industry and Trade. His disinterested services were fittingly recognized; the Order of Merit was conferred on him in 1916 and in 1919 the chancellorship of Cambridge University. Finally, in 1922 he was created first Earl of Balfour and Viscount Traprain of Wittingehame, and thus took his seat in, and became leader of, the House of Lords, after serving in the Commons for almost 50 years. He published, after 1914, *Theism and Humanism* (1915), *Essays, Speculative and Political* (1920), *Theism and Thought* (1923), and *Opinions and Arguments* (1927).

**BALFOUR, SIR ISAAC BAYLEY** (1853-1922). A Scottish botanist, born at Edinburgh (see Vol. II). From 1888 to the year of his death, he was King's Botanist in Scotland, Regius Keeper of the Royal Botanic Garden at Edinburgh, and professor of botany at the University of Edinburgh.

**BALFOUR DECLARATION.** See PALESTINE.

**BALIEV, NIKITA FYODOROVITCH** (?- ). A Russian actor and theatrical producer whose reputation in America was due to the success of his Chauve-Souris company. This "bat theatre" was originally a cabaret where the authors and artists of Moscow gathered for amusement and relaxation. The prohibition of the World War turned the cabaret into a regular theatre of which the Revolution disapproved because there was no connection between the plays and the proletariat, so Baliev fled to Paris with his troupe. Paris (1920), London, and New York (1922-23, 1925, and 1929) saw in his productions the "enigmatic smiling Russia that is of no time and no age."

**BALKAN STATES.** The collective term applied to those states which make up the Balkan

peninsula in southeastern Europe north and west of the Aegean sea. See ALBANIA, BULGARIA, GREECE, JUGO-SLAVIA, RUMANIA, and TURKEY.

**BALL, ELMER DARWIN** (1870- ). An American entomologist, born at Athens, Vt. (see Vol. II). He was State entomologist of Wisconsin (1916-18), and professor of zoology and entomology at the Iowa State College, and State entomologist of Iowa (1918-21). He was on leave as Assistant Secretary of Agriculture (1920-21) and in the latter year became director of the scientific work of the Department of Agriculture. This position he held until 1925, when he resigned to take charge of celery insect investigations for the Florida State Plant Board, at Sanford, Fla. From 1915 to 1916 he was president of the Pacific Slope Association of Economic Entomologists, and in 1918 was elected president of the American Association of Economic Entomologists.

**BALLANCE, SIR CHARLES ALFRED** (1856- ). A distinguished British surgeon who has specialized in cranial and vascular surgery. He received his medical degree from the University of London in 1881. He was chief surgeon to the Metropolitan Police (1912-1916), consulting surgeon to various hospitals, and, during the World War, consulting surgeon to the British army. He was knighted in 1918. Among his published works are *Surgery of the Brain and Its Membranes* (1907); *Cerebral Decompression* (1912); *Surgery of the Temporal Bone*, 2 vols. (1919); *Surgery of the Heart* (1920) and *History of Surgery of the Brain* (1922). Earlier in his career, he wrote two other works in collaboration, *The Healing of Nerves* with Stewart (1901), and *Treatise on Ligature of the Great Arteries in Continuity*, with Edmunds (1891).

**BALLANTINE, HENRY WINTHROP** (1880- ). An American professor of law, born at Oberlin, Ohio, and educated at Oberlin, Amherst, and Harvard and the Harvard Law School. He was admitted to the California bar in 1904 and was lecturer on law at the University of California and assistant professor of law at Hastings College of Law in San Francisco, 1905-09. He was dean of the law school of the University of Montana, 1911-13, professor at the law school of the University of Wisconsin, 1913-16, and dean of the College of Law of the University of Illinois, 1916-20. In 1920 he became professor of law in the University of Minnesota and in 1924 professor of law at the University of California. Besides contributions to periodicals, he has written *Problems in the Law of Contracts*, *Preparation of Contracts and Conveyances* (1921), *Problems in Law With Solutions* (1927), and *On Corporations* (1927).

**BALLET.** The year 1910 marked the beginning of a new era in the history of the ballet. In May of that year Sergei Diaghilev appeared in Paris with his new and individual creation the Ballet Russe, which immediately created a sensation. He had been working for several years toward the realization of his new ideas and had found sympathetic allies in Leon Bakst, the painter, and Michael Fokin, the director of the Imperial Ballet in Moscow. Fokin, before meeting Diaghilev, had seen Isadora Duncan interpreting choreographically masterpieces of absolute music (Beethoven's Seventh Symphony, Chopin, Schumann, etc.). Her art suggested to him the idea of using the mere technical skill of the dancer as a means for the expression of defi-

nite emotions through pantomime. Thus the collaboration of Diaghilev, Fokin, and Bakst resulted in the development of the ballet by coordinating dancing, stage-decorations, costumes, lighting-effects and music, and fusing these concomitant elements into a homogeneous whole. Moscow thus became the cradle of the new art. The beginning was made with the ballets in the regular repertory, which were interpreted in the new style. Then, following the example of Isadora Duncan, Fokin adapted choreographic actions to famous instrumental works, such as Rimsky-Korsakov's *Scheherazade*, Debussy's *L'Après-midi d'un Faune*, Strauss's *Till Eulenspiegel*. About that time Diaghilev met Stravinsky, then entirely unknown, whose style of music seemed to fit admirably into the general scheme of things. The young musician was commissioned to write the music to *L'Oiseau de Feu*. In 1909, Diaghilev visited Paris with an operatic company, ostensibly for the purpose of introducing Russian operas, in which ballets figure extensively. Incidentally, separate performances of standard ballets also were given, and these aroused the greatest enthusiasm. The following year Diaghilev returned, but only with the Ballet Russe. It was then that Stravinsky's ballet, *L'Oiseau de Feu*, was produced with sensational success. The next year (1911) furnished another sensation, the same composer's *Petrushka*. Two years later, these phenomenal successes were even eclipsed by *Le Sacre du Printemps*. The opinion of musicians regarding the value of Stravinsky's scores as absolute music does not enter into consideration here; what counts is the fact that this music fits into the general ensemble as no other music does. This was proved before long, when Diaghilev commissioned ballets from other composers of considerable reputation: Debussy (*Jeux*), Ravel (*Daphnis et Chloé*), Hahn (*Le Dieu bleu*), Dukas (*La Péri*), Tche-repnin (*Narcisse, Le Pavillon d'Armide*), R. Strauss (*Légende de Joseph*). Paris had gone wild over the new art, London fully indorsed the verdict of Paris, and even conservative New York gasped when the new organization made its first appearance there (1916). Such was the success of the original season of two weeks that the regular season at the Metropolitan Opera House was shortened by three weeks in order to present the new sensation to the subscribers. Although Diaghilev has not revisited the United States, interest in the new art has been kept alive by the tours of several remarkable artists. Those that have established a national reputation are: Anna Pavlova, Maria Theresa, Anna Robenne, Michael Mordkin, Michael Fokin and Vera Fokina, Zara Alexieva and Holger Mehnert, W. Nijinsky, The Denishawn Dancers (Ruth St. Denis and Ted Shawn), the Pavley-Oukrainsky Ballet (with the San Carlo Opera Company) and Adolf Bolm (with the Chicago Opera Company).

**BALLET**, hāl'lā, GILBERT (1853-1916). A distinguished French neurologist and alienist, born at Ambazac (Haute-Vienne), who received his medical education at Limoges and Paris. In 1882 he became chief of the clinic at the Salpêtrière. He outlined a reform of the French lunacy law in 1914 and was one of the most active opponents of alcohol abuse in France. He was appointed professor of the history of medicine (1907) and clinical professor of mental diseases two years later in the University of Paris. In 1897 he published his *Psychoses et*

*Affections Nerveuses* and in 1902 collaborated with Proust in the publication of the *Traité de la Neurasthénie*. His greatest work was the *Traité de Pathologie Mentale* (1903). His *Life of Swedenborg* appeared in 1899. Two translations of his *Neurasthenia* were published in English, in 1902 and 1911.

**BALLIN**, ALBERT (1857-1918). A German merchant, director-general of the Hamburg-American line. He was born in Hamburg and had a commercial education, both at home and in England. After organizing the emigrant traffic of the Carr Line, he took charge of the passenger traffic of the Hamburg-American Line; in 1886 he became a director and subsequently director-general. He increased the share capital tenfold and by acquiring other lines extended the business of the company to all parts of the world. He was the author of the German-American shipping agreement of 1902. As a special confidant of William II, he advised him on all commercial questions. During the World War, he published some newspaper articles justifying Germany.

**BALLIN**, Hugo (1879- ). An American figure and decorative painter, born in New York City (see VOL. II). He turned his attention to motion pictures and became president of Hugo Ballin, Inc., which produced and mounted more than eighty feature motion pictures including: *East Lynne*, *Pagan Love*, *Baby Mine*, *The Journey's End*, *Jane Eyre*, *Vanity Fair*, and *Married People*.

**BALLOON**. See AERONAUTICS.

**BALLOONS**, IN WARFARE. See STRATEGY AND TACTICS.

**BALMONT**, KONSTANTIN D. (1867- ). A Russian poet, one of the leading symbolists, and the founder of the Modernist school of Russian poetry with Bryusov (q. v.). At first he caused a sensation but later lost some of his popularity on account of frequent repetitions. He translated extensively from other languages, especially English, and wrote many critical essays. Some of the best known of his volumes of poems are *Under Northern Skies* (1894), *Silence* (1898), *Burning Buildings* (1900), *Let Us Be Like the Sun* (1903), *Love Only* (1904), *The Flame-Bird* (1907), and *Mirage* (1922). He also wrote *Phlox Clusters* after a journey to Mexico, besides many short stories and a book of poems for children. His translations include Shelley's complete works, Whitman (most of the *Leaves of Grass*), Poe, who influenced his writing, Ibsen's dramas, Calderon's poems, and works from the German, Polish, and Sanskrit.

**BALTIC PROVINCES**. A term applied to three former provinces of the Russian Empire, Courland, Livonia, and Estonia, in the region of the Baltic Sea. At the conclusion of the World War, a German army occupied the provinces, and article 12 of the Armistice Convention called for its withdrawal "as soon as the Allies shall consider this desirable." To embarrass the Powers, however, the Germans decided to withdraw at once, and beginning with November, 1918, detachments quit the country as Bolshevik forces spread westward. The situation was further complicated when German troops under General von der Goltz were induced to stay in Latvia to play the rôle of liberators. February, 1919, saw 20,000 Germans concentrated in the Libau-Windau area and actively meddling in Latvian affairs. The tone of the Allied notes became caustic with this turn of events.

On Apr. 23, 1919, the Allies called for the end of German interference in local matters and the recall of von der Goltz; on June 18 a demand was made for German evacuation in accordance with the terms of the Armistice. But an ultimatum from General Foch in the summer succeeded neither in hastening withdrawal nor in preventing the German march north into Estonia. It was not until the Supreme Council threatened economic pressure that Germany showed a willingness to heed Allied protests. A mixed commission was appointed to superintend the withdrawal; evacuation was begun in November, not without material damage to the population; and by the middle of December, it was complete. The subsequent history of the Baltic Provinces is discussed elsewhere under the names of the two republics, Estonia and Latvia, which were created out of this territory. See ESTONIA and LATVIA.

**BALTIMORE.** The metropolis of Maryland. The population rose from 558,485 in 1910 to 733,826 in 1920, and to 830,400 in 1928 by estimate of the Bureau of the Census. The area of the city increased from 31.8 square miles in 1914 to 91.93 square miles in 1924, of which 78.82 square miles were land. An extensive municipal improvement programme was developed in 1920. Loans for \$51,750,000 were authorized by popular vote in that year, and in 1922 another loan of \$15,000,000, in addition to the \$7,000,000 allotted for the purpose from the earlier loan, was voted for school improvement. With these sums, 16 new schools and a city college were built, and other schoolhouses already built were repaired and improved. The water supply for the city for many years to come also was assured by the raising of the Loch Raven Dam from 188 to 240 feet elevation, the purchase of 4000 acres of land and the razing of two villages.

A large water main was extended into each section of the new annex to the city, and the private water companies operating there were purchased. A filtration plant was built, and plans were made for increasing its capacity. The sewage plant was enlarged and 162 miles of sewers laid in the old city and the annexed district. The municipal hospital for communicable diseases was constructed in 1923, the police department was reorganized with a commissioner at its head, and a \$1,000,000 loan for the erection of police buildings was approved in 1923. Progress was made in street paving and several bridges were built. In 1923 a zoning ordinance was adopted, regulating the height and bulk of new buildings, the size of courts and yards, the number of families permitted to be housed per acre, and the location of industries and trades. It divided the city into four use-districts, five height-districts, and six area-districts. From 2500 to 5000 houses are built annually to take care of the growing population. The assessed value of property for taxation purposes in 1928 was \$1,935,040,570, according to local estimate; the net debt in 1927 was \$125,342,000.

Baltimore is the second Atlantic coast port in foreign trade volume and the first United States port in intercoastal traffic westward via the Panama Canal. It has 127 miles of deep-water frontage, about 45 miles of which has been developed, and berthage space of 90,549 lineal feet. Navigation facilities comprise a main ship channel 35 feet deep at mean low water and 600 feet wide, numerous subsidiary channels with depths

ranging upward to 35 feet, and anchorage areas 1200 acres in extent with depths ranging from 25 to 35 feet. Congress has authorized a large increase in the deep-draft anchorage facilities of the port, and efforts were under way to secure uniform 40-foot channels, 1000 feet wide, for the proper accommodation of shipping needs. In 1920 the General Assembly of Maryland passed an Enabling Act authorizing the city of Baltimore to incur bonded indebtedness to the amount of \$50,000,000 for the purpose of developing, expanding, and improving the harbor and its facilities.

Wharf, pier, warehouse, terminal, and other constructions were specified in the act, which also authorized the work to be done under the direction of a Port Development Commission named by the Mayor, the initial personnel of the commission being named in the Ordinance. At a subsequent municipal election the voters made available \$10,000,000 as the first installment of the loan. Initial construction under this programme was completed in August, 1929, involving new terminal equipment for the Western Maryland Railway in the Port Covington section of the harbor. Total vessel movements of the port in 1928 reached entrances of 2912 vessels of 7,758,417 net ship tons and clearances of 3402 vessels of 8,507,859 net tons. The valuation of Baltimore's total port business increased from \$587,000,000 in 1922 to \$781,000,000 in 1927.

The total foreign and domestic commerce of Baltimore has risen from 13,195,626 to 17,160,697 short tons of cargo in five years. Customs receipts of Baltimore increased from \$1,587,006 during the fiscal year 1920 to \$11,612,226 during the fiscal year 1928. Its foreign trade in 1928 was valued at approximately \$226,025,000 with almost a perfect balance between exports and imports. Baltimore has 37 regular overseas steamship services, operating vessels to all important world markets; 9 steamship lines operating intercoastal service via the Panama Canal to all important Pacific coast points; and 11 steamship lines operating in regular coast service to all important points on the Atlantic and Gulf coasts.

Baltimore is the seventh city in the United States industrially, the annual output of its 2000 factories approximating \$700,000,000. More than 85,000 persons are employed in these industries and receive \$100,000,000 annually in wages. Industries producing \$40,000,000 or more annually include men's clothing, copper and products, meat packing, and sugar; those producing \$20,000,000 or more annually embrace foundry and machine work, tinware, cotton garments, fertilizers and materials, printing and publishing.

During 1928, 44 new industries were announced for Baltimore, with a proposed physical plant investment of \$31,720,000 and proposed labor requirements of 4245 workers; also 45 existing factories expanded their facilities at an expenditure of \$5,805,000, necessitating new labor demands of 3519 workers. This was the largest plant investment to be announced in any year since 1920 and represents an increase of 219 per cent over 1927, 221 per cent over 1926, and 152 per cent over 1925. The Western Electric Company has built a new plant costing \$24,000,000 designed to be, when completed, the largest industry within the corporate limits of Baltimore, and when fully operating employing 30,000 persons.

At the last meeting of the Maryland Legislature in 1928, an enabling act to finance the building of a municipal airport for Baltimore was approved to the extent of \$1,500,000 and subsequently submitted to and approved by the voters. In addition, the Public Improvement Commission agreed to allot out of its harbor funds of the general improvement loan the sum of \$700,000, making a fund of \$2,200,000 available. The Legislature has been requested to authorize an additional loan of \$2,500,000 for this purpose. Up to 1929, approximately \$8,000,000 had been invested in commercial airports and aircraft manufacturing facilities in Baltimore, the leading manufacturers being the Glenn L. Martin Company. Their project also embraces schools for the training of pilots and instruction of aircraft mechanics and technicians, radio and telegraph facilities, a service station, a hotel for transient air passengers, and a water-front home development for those desiring close association with aircraft in all its phases.

**BALUSCHEK, HANS** (1870- ). A German painter who was born in Breslau and studied at the Berlin Academy. He was a realist excelling in scenes of contemporary life, such as his railroad series, among them "On the Locomotive," and "the Station," his factory, foundry, and mining scenes, and "Berlin at play," and "Berlin during the Revolution." He is represented in many European galleries.

**BANAT OF TEMESVAR**, *băn'at of tēm'esh-vār*. Formerly a territory of the Hungarian Kingdom but since 1919 a Rumanian province of the same name. Its area is 11,009 square miles, and its population, 1,582,133. In 1916, in order to gain Rumanian support, the Allies, by a secret treaty of whose terms the Serbs were not apprised, promised Rumania the entire Banat. This was done in spite of the fact that the district is ethnographically by no means a homogeneous unit, there being Slavs in the west, Rumanians in the east, and strong Hungarian and German minorities throughout. In 1919, an act of union of the Banat with Rumania was promulgated by the Rumanian Crown and the Peace Conference was confronted by a *fait accompli*. The Supreme Council, however, refused to recognize the annexation and by the statement of June 12, 1919, divided the Banat between Jugo-Slavia and Rumania. Meanwhile, the Serbs occupied the district, and, partly in protest against an action that seemed to have the tacit consent of the Supreme Council, the Rumanians marched into Hungary and invested Budapest. It was not until the signing of the Treaty of the Trianon (June, 1920) that Rumania finally signified her consent to the partition of the district. By this arrangement, the counties of Krassó-Szörény and Temes in the east were granted to Rumania, and the county of Torontál, bordering on the Danube, to Jugo-Slavia. The economic considerations underlying the diplomatic controversy were perhaps of greater importance than the purely racial. To the Serbs, whose lands are deficient in cereals, the rich farming country of the Banat made an especial appeal. The peasants of Temesvár wished to join the Serbs; the landowners, because of Rumania's traditional friendliness toward their class, sought annexation to her. Again, any north and south boundary line through the country must disorganize its economic life because the westward-flowing streams, the railways, and canals, all would be cut. That both countries

desired the whole Banat was natural; and the partition of the territory in 1920 left a group of problems difficult of solution and containing elements of inevitable discord.

**BANCROFT, WILDER DWIGHT** (1867- ). An American chemist and educator, born at Middletown, R. I. (see Vol. II). In 1913 he became associate editor of the *Journal* of the Franklin Institute. After serving as consulting chemist to the Bureau of Mines, he was active in the World War period as chairman of the subcommittee on electro-chemistry of the National Research Council (1917-18), and chairman of the division of chemistry (1919-20). He was also a lieutenant colonel in the Chemical Warfare Service, and a member of the advisory committee of the Service (1918-19). From 1922 to 1925, Professor Bancroft was a member of the board of visitors of the United States Bureau of Standards, and in the same period he was vice president of the International Union of Chemistry. He received the honorary degree of D.Sc. from Lafayette College in 1919 and from Cambridge University in 1923. In 1921 he published *Applied Colloid Chemistry*.

**BANDHOLTZ, HARRY HILL** (1864-1925). An American soldier (see Vol. II). He served on the Mexican border in 1916. After the entry of the United States into the World War, he became chief of staff of the Twenty-Seventh Division (New York) and went with it to France, serving in this capacity until Feb. 9, 1918. From that date until Sept. 27, 1918, he commanded the 58th Infantry Brigade. Then he became provost marshal general of the American Expeditionary Forces and was charged with the duties not only of maintaining order in the Army but of detecting and apprehending enemy spies. He remained as provost marshal general until Aug. 5, 1919, and then, until 1920, served as American representative of the interallied military mission to Hungary. He was commander of the 13th Infantry Brigade and on Sept. 21, 1921, he was transferred to the District of Washington. He suppressed miners' riots in West Virginia, Sept. 1-12, 1921. In November, 1923, he was raised to the rank of major general. For his services in the World War, he received the Distinguished Service Medal, and decorations from the Governments of France, Belgium, Italy, Rumania, and Montenegro. General Bandholtz served as commander-in-chief of the Spanish War Veterans.

**BANDLER, SAMUEL WYLLIS** (1870- ). An American obstetrician and gynecologist, educated at Columbia University, who was professor of obstetrics and gynecology in the New York Post-graduate Medical School. In addition to papers on obstetrics, gynecology, and endocrinology, he wrote many books, including *Dermoid and Other Cysts of the Ovary* (1901), also issued separately in German; *Uterine and Tubal Gestation* (1903); *Medical Gynecology* (1908); *Vaginal Celiotomy* (1911); *The Expectant Mother* (1916); and *The Endocrines*, (1920). In 1901 he published a translation into English of Abel's *Gynecological Pathology*.

**BANERJEA, SIR SURENDRANATH** (1848-1925). An Indian political reformer and journalist knighted in 1921. He was educated at Doveton College, Calcutta, and University College, London. Early in his career he opened a school in Calcutta which later became Ripon College. In 1876 he became editor of the Bengalee newspaper, a political instrument in his



hands. In 1905 he supported the boycott of foreign goods and the "national education" movement. He went to London in 1919 as representative of an "Indian Liberal" organization which he had formed and gave evidence before the Joint Parliamentary Committee of both Houses on Indian Reforms. From 1921 until the elections of 1924, he was Minister for Local Self-Government and Public Health in Bengal. Thereafter, he wrote his autobiography: *A Nation in the Making, being the Reminiscences of Fifty Years of Public Life in Bengal*.

**BANG**, **BÄNG**, **IVAR** (1869-1918). A Swedish chemist who began his career as a practicing physician but took up chemistry under Professor Hammarsten of Upsala, 1897-99. His research attracted wide attention and led to his appointment in 1904 as professor of medical chemistry in the University of Lund. Of several branches of biochemistry to which he devoted especial attention, the most significant was the so-called micromethod of quantitative analysis of the blood. As a result of this, it is possible to determine the percentage of constituents by testing very small amounts of blood. His writings include *Chemie und Biochemie der Lipide* (1911), *Der Blutzucker* (1913), *Methoden zur Mikrobestimmung einiger Blutbestandtheile* (1916), and *Lehrbuch der Harnanalyse* (1918).

**BANKING**. See **FINANCE** and **BANKING**.

**BANKS**, **COÖPERATIVE**. See **LABOR BANKS**; **COÖPERATION**.

**BANNING**, **KENDALL** (1879- ). An American editor and author, born in New York City and educated at Dartmouth (1902). From 1903 on he was engaged in the editing and publishing of magazines, the editing of books and the writing of magazine articles, songs, books, and plays. He was managing and associate editor of *System* (1903-17), managing editor of *Hearst's Magazine* and the *Cosmopolitan* (1919-21), and editor of *Popular Radio* (1922-28). During the World War, he served as a major in the Signal Corps, United States Army, as director of the division of pictures of the Committee on Public Information, and as major on the general staff of the Army; he was made officer in charge of compilation of a pictorial record and history of the War. He edited a Dartmouth anthology and *Songs for a Wedding Day*, and (with L. M. Cockaday, 1924) *How to Build Your Own Radio Receiver*. Among his books are *Flotsam* (1903); *Bookplates* (1906); *Bypaths in Arcadia* (1914); *Pirates* (1916), and *The Great Adventure* (1925). He wrote also *Copy*, a one-act play, and *The Garden of Punchinello* (1917) and *A Garden Fate* (1919), pantomimes.

**BANTA**, **ARTHUR MANGUN** (1877- ). An American zoölogist, born near Greenwood, Ind. He was educated at Indiana and Harvard universities. He was a teacher in Indiana public schools (1895-1901); assistant in zoölogy, Indiana University (1903-05); assistant in zoölogy at Harvard, (1905-06), and teaching fellow, (1906-07). He became professor of biology at Marietta College (1907-09); and in 1909 resident investigator at the Station for Experimental Evolution of the Carnegie Institution, Cold Spring Harbor, N. Y. His researches have been made into the development of pigment in animals, into the effects of changed environment on cave-dwelling and non-cave-dwelling animals, and into sex determination and other subjects of biological and zoölogical importance.

**BANTING**, **FREDEBICK GRANT** (1891- ). A Canadian physician born at Alliston, Ont. In 1922 he received the larger share of credit for the discovery of insulin (see **DIABETES**), apparently one of the greatest practical triumphs of laboratory medicine. With him was associated Dr. Charles Herbert Best, of Toronto. Dr. Banting took his medical degree at the University of Toronto in 1916. Two years later he became a Member of the Royal College of Surgeons and Licentiate of the Royal College of Physicians. During the World War, he was a captain in the Army Medical Corps. He practiced medicine until May, 1921, at London, Ont., holding also a teaching position at Western University in the same city. He was lecturer in pharmacology at the University of Toronto, (1921-22), and later senior demonstrator in the department of medicine. Since 1923 he has been professor of medical research. The first announcement of his great discovery was made in the *Journal of Laboratory and Clinical Medicine*, vol. vii (1921-22). Banting and Best also published jointly an article on the treatment of diabetes mellitus in the *Canadian Medical Association Journal*, vol. xii (1922). In 1923 the Canadian government awarded Banting an annuity of \$7500, to enable him with freedom from pecuniary worry to devote his time to the further study of this and similarly important matters. He received the Starr Gold Medal for Doctorate, University of Toronto, 1922; the Nobel Prize for Medicine, 1923, and the Scott Medal, 1924.

**BANTU**. See **ETHNOGRAPHY**.

**BAPTISTS**. The second largest Protestant denomination in the United States, first established in America in 1839. Three principal bodies represent the Baptist churches in America: The Northern, Southern, and National (Negro) Conventions. Fourteen separate Baptist organizations are listed in the *American Baptist Year Book* for 1928, but the minor divisions, such as Primitive, United, General, Free, etc., are separated from the main body of the denomination by no serious differences and the trend for many years has been in the direction of Baptist unity. The Free Baptists, for example, have practically merged with the Northern Convention. Between 1914 and 1927 Baptist membership in America increased from 5,799,233 to 8,587,498. From 1914 through 1927, the Southern Convention advanced in membership from 2,522,623 to 2,821,079; the Northern Convention from 1,291,688 to 1,419,883; and the National Convention from 1,934,952 to 3,515,542. The denomination made enormous gains among the Negroes, both in the North and the South, and a Negro church, Olivet of Chicago, had the largest Baptist congregation in the world. The aggregate Baptist membership of all countries, from whose churches reports were obtained, was 10,672,512 in 1927. There was a rapid increase in Russia and Eastern Europe generally after 1917, as the Slav population found the Baptist doctrine and polity congenial and turned to them as a substitute for the disrupted churches of the post-revolutionary period. No accurate statistics were obtainable, but there were in 1927, about 1,000,000 Russians who called themselves Baptists. The next largest group of Baptists outside of the United States was found in the British Isles where there were over 400,000 members.

While the attitude of opposition to infant



baptism, and its corollary, acceptance of "believer's baptism," are distinguishing marks of all Baptist bodies, there is no Baptist creed. It is characteristic of the denominational spirit that no authority exists with power to bind the individual churches in respect to matters of faith. The Northern Baptist Convention in 1924 accepted as an expression of the Baptist position the Stockholm declaration of the Baptist World's Alliance, formulated in 1923, a statement covering those points upon which practically all Baptists are agreed. This action was taken with the definite provision that the statement was in no sense to be regarded as a creed.

Baptist churches have always held to the congregational or independent system. Indeed, the Baptist temper and tradition would hardly tolerate any other, though there was a growing disposition to moderate an individualism which left each church absolutely sovereign in matters touching its own worship and discipline, but lacked certain advantages in achieving purposes held by all the churches in common. This tendency to coördinate Baptist activities found expression in the New World Movement of the Northern Convention, a five-year programme which terminated in April, 1924, and in the \$75,000,000 campaign of Southern Baptists. In the case of the Northern Baptists, the movement resulted in the establishment, in 1924, of a permanent organization to unify and coördinate the work of the various participating organizations, known as the Board of Missionary Coöperation. This board was made the agent of seven national societies and boards, 36 State conventions, 14 standard city mission societies, and 52 schools and colleges, for the purpose of disseminating information regarding the various organizations and raising funds for them. The churches, numbering nearly 10,000, which united through the Northern Convention in support of all these agencies, remained as independent as ever, but they were applying such a measure of coöperation as their experiences after 1919 showed to be possible and desirable. The receipts of this board for the year 1925-26 totaled over \$7,000,000, and were in turn distributed to 13 participating organizations.

The period which saw the rise of the coöperative spirit in the denomination also saw the Baptist organizations take advanced ground for a ministry of service. A strong Baptist interest always supported schools maintained under Christian influences and in 1928 there were 235 educational institutions maintained by the denomination in the United States and Canada, while such institutions as Chicago, Brown, Colgate, and Rochester universities, and Vassar College testify to the zeal for education that has not been limited to America. In Burma, Judson College, bearing the name of the most famous of Baptist missionaries, was constituted an integral part of the University of Rangoon, taking equal rank with the Government college. Great progress also was made in the development of opportunities for the education of women in the Orient, especially in India and China; foreign missions were supported in India, Burma, the West Indies, Central and South America, China, Japan, Africa, the Philippines and European countries; and there were churches in every part of the globe.

**BAPTISTS, FREE.** This branch of the Baptist denomination was undergoing union with

the Northern Baptist Convention throughout the period between 1914 and 1928, having practically completed its policy of merging in the latter year. The movement began in 1911, and complete financial arrangements were made in 1919, but the denomination retained its separate legal existence for the administration of funds and interests which awaited final settlement and transfer. See BAPTISTS.

**BARÁNY, ROBERT** (1876- ). An Austrian otologist, born in Vienna. Originally he was an assistant of Pollitzer and as a student in the University of Vienna, he began in 1902 a series of investigations on the internal ear which culminated in his monograph, *Physiologie und Pathologie des Bogengangapparates beim Menschen*, for which he was awarded the Nobel Prize in medicine in 1915. In 1916 he received the appointment of professor of otology in the University of Upsala. In 1919 he published *Primäre Excision und Primäre Naht Accidentellen Wunden* and in 1923, *Die Radikaloperation des Ohres*.

**BAR ASSOCIATION, AMERICAN.** An organization founded in 1878 to advance the science of jurisprudence, promote the science of justice and uniformity of legislation and of judicial decision throughout the nation, uphold the honor of the profession of the law, and encourage cordial intercourse among the members of the American Bar. Membership increased from 10,500 in 1916 to 27,500 in 1929. Addresses by men prominent in commercial, professional, and educational fields continued to be an interesting feature of the annual meetings of the Association during the period 1914-28. Among the important resolutions adopted during this period were: those in 1918, protesting against the attempt to deprive the judges of the United States courts of the right to express their opinion on questions of fact in jury cases, and supporting every grant of power desired by the President to help in winning the War, but expressing the opinion that constitutional changes were unnecessary; in 1919, approval of an act to make uniform in all States the law of conditional sales and the law of fraudulent conveyances and to continue organized opposition to judicial recall; in 1921, censuring Kenesaw M. Landis in accepting private employment while a member of the Federal bench; in 1923, favoring adherence to the Permanent Court of International Justice, calling a new conference of nations at The Hague to restate the established rules of international law, to agree on certain amendments, and to consider certain subjects which were not adequately regulated by international law. In 1924 the Association urged the enactment of the Commercial Arbitration Act (SB-1005); in 1926, adopted a resolution to coöperate with the Veterans' Bureau in caring for the right of so-called "orphans' cases"; and in 1928, approved the Act to Promote Conservation of Petroleum and Natural Gas, etc., and the Uniform Public Utilities Act. The President elected at the 1928 meeting at Chicago was Gurney E. Newlin of Los Angeles, Calif. The headquarters of the Association are at Room 1119, 209 S. LaSalle Street, Chicago.

**BARBADOS, bār-hā'dōz.** The most easterly of the West Indian Islands, belonging to Great Britain, with an area of 166 square miles, and a population (census of 1921) of 166,312; estimated, 1927, 169,385. The cultivation of sugar and cotton are the leading activities. The immediate years of the the War were marked by great prosperity in the island, the culmination

being reached in 1920 when exports showed a value of £4,865,700, and imports £5,145,537. (Compare with the 1913-14 figures of exports of £760,699; imports £1,353,059.) In 1926-27, the imports were valued at £2,155,167; the exports, £1,287,161.

**BARBER, DONN** (1871-1925). An American architect, born in Washington D. C. He was educated at Yale and Columbia Universities and the École des Beaux Arts in Paris. In 1900 he began the practice of his profession in New York, where he designed many buildings, including the National Park Bank Building, Lotus Club, and the Institute of Musical Art. Other buildings designed by Barber are the Connecticut State Library in Hartford, Conn., and the Department of Justice Building in Washington. The last named was successful in a government competition. He was one of the originators of the atelier idea in the United States, conducting such an institution in his own office. For many years, he was editor of the *New York Architect*. He was a member of the National Academy of design and at one time president of the Society of Beaux Arts Architects.

**BARBOUR, CLARENCE AUGUSTUS** (1867- ). An American university president. He was born at Hartford, Conn., graduated at Brown University (1888), and studied at Rochester Theological Seminary (1888-91). After being ordained to the Baptist ministry, he was pastor of the Lake Avenue Church, Rochester, N. Y. (1891-1909) and associate secretary of the International Committee, Y. M. C. A. (1909-15). From 1915 to 1929, he was president of the Rochester Theological Seminary and professor of homiletics. In the latter year, he was chosen president of Brown University. In 1916-17 he was president of the Northern Baptist Convention. He is the author of *The Bible in the World of Today* (1911); *Principles and Methods of Religious Work for Men and Boys* (1912); *Making Religion Efficient* (1912); and editor of *Fellowship Hymns* (1910); and *Service Song Book* (1917).

**BARBOUR, RALPH HENRY** (1870- ). An American author, born at Cambridge, Mass. (see Vol. II). His more recent writings include *Under the Yankee Ensign* (1919), *Mystery of the Sea Lark* (1920), *Quarter Back Bates* (1920), *Metipom's Hostage* (1921), *Over Two Seas* (1922), and "Right End Emerson" (in *Football Eleven Books*, 1922).

**BARBUSSE, HENRI** (1874- ). A French writer and novelist who was born at Asnières (Seine), worked as a dramatic critic on various Paris newspapers, and acquired international fame almost over night as the result of the publication of his war novel, *Le Feu* (1916). It is the story of a squad in the trenches, told in the poilus' own unvarnished language. The gruesome, crude details of butchery and animality of life at the front were realistically narrated, and against this background the author made his heroes philosophize on the future of humanity. Despite its pacifistic tendencies, *Le Feu* was awarded the Prix Goncourt. It was followed by *Clarté* and *La Lueur dans l'abîme, ce que veut le groupe Clarté*, both of which continued the author's purpose of using art as a vehicle for social regeneration. At the close of the World War, M. Barbusse organized the Clarté movement, which sought to group together the writers of the world and interest them in the social and political progress of humanity. He

also organized a union of war veterans of France to fight for the ideal of internationalism. Both these organizations drifted into politics and became more or less affiliated with the regular syndicalist and communist groups, and he became literary director of *L'Humanité*, the organ of the Communist Party. His other works include *Pleureuses*, poems (1895); *Les Suppliants* (1903); *L'Enfer* (1908); *Nous autres*, short stories (1914); *Quelques Coins du Cœur* (1921); *Le Couteau entre les Dents* (1921); *Les Enchaînements* (1925); *Jésus* (1927); *Les Judas de Jésus* (1927), and *I saw it Myself* (1928). Several of these books were translated into English. Consult *Henri Barbusse*, by Henri Hertz (1920), and *Voilà vos bergers*, by Émile Vêrût (1928).

**BARCELONA.** The most important maritime and industrial centre of Spain. The population at the census of 1923 was 720,311; in 1927 it was estimated to be 760,348. The Old Town, through which the Ramblas form the principal thoroughfare, is the business section of the city. The Ensanche, or modern part of the city, is traversed by broad promenades and avenues, some of which are several kilometers in length and are lined by artistic buildings, and profusely planted with trees. The Old Town is inclosed and divided from the Ensanche by a circle of Rondas. These Rondas have several expansions, but the principal one is the spacious Plaza de Cataluña, the central point of the city. Overlooking the Plaza are the Obras del Puerto palace, or marine station, and the customs house. Other modern buildings include the University of Letters, the Faculty or College of Medicine, the Hospital of San Pablo, the Catalan Concert Hall, the Royal Palace, the post office, and the Church of the Holy Family, a beautiful specimen of Catalan architecture. The medieval Chapel-Royal of Santa Agueda has been converted into an archaeological museum. In December, 1924, the first subway in Barcelona was opened, and in 1928 a royal concession was granted for building a subway between Barcelona and Badalona to be completed within four years at an estimated cost of 50,000,000 pesetas. Harbor facilities are also being improved and a large free port constructed.

The Barcelona International Exposition, which was held in the Park of Montjuich, was opened on May 1, 1929, and continued through the year, involving an expenditure of 140,000,000 pesetas. It was divided into three main groups: Artistic and historical; industrial and commercial; and athletic. Five permanent structures were erected: the National Palace, housing the artistic and historical exhibits; the Palace of Building Arts; the Palace of Temporary Exhibits; the Press Building; and a stadium seating 60,000 persons. Among the temporary buildings were the palaces of agriculture, textile and allied industries, electricity and motive power, the theatre, labor, sports equipment, modern arts, graphic arts, missions featuring the missions exhibit of the Vatican, and the State Pavilion consisting of public service exhibits. The artistic and historical group stressed the development of Spain from earliest history to the present, showing the influence of foreign contact on the Spanish race and culture. Life in a typical Spanish village in the Middle Ages was one of the principal attractions. During the exposition, international regattas, automobile and horse races, swimming contests, golf and polo matches, and bull fights were held, and plays of the

Spanish classic period were staged in the Greek Theatre.

**BARCROFT, JOSEPH** (1872- ). A British physiologist born at Newry, Ireland, and educated at King's College, Cambridge, where he later was associated as lecturer for many years. During the World War he was a member of the Ministry of Munitions and later became a member of the chemical warfare committee of the War Office. In 1920 he was president of the section on physiology of the British Association. He was made Fullerian Professor of Physiology at the Royal Institution in 1923 and in 1926 professor of physiology at Cambridge. He published many records of original experiments on physiological subjects, mostly in the *Journal of Physiology*; edited the 6th edition of Huxley's *Physiology* and was joint editor of the *Cambridge Comparative Physiology*. His only book is *Respiratory Function of the Blood*. Professor Barcroft became widely known for severe experiments conducted on himself. He was made a fellow of the Royal Society in 1910, a commander of the Order of the British Empire in 1918, and received many other prizes and medals.

**BARD, HARRY ERWIN** (1867- ). An American educator in Peru. He was born at Crawfordsville, Ind., and was educated at Wabash College and Columbia University. After holding positions as instructor, 1894-98, he was appointed division superintendent of schools in the Philippine Islands (1901-06). He was a research scholar at Teachers College, Columbia University (1907-09), and from 1909 to 1912 was official adviser of the Ministry of Instruction at Lima, Peru. He was organizing director of the Pan-American Division of the American Association for International Conciliation in New York (1913-15) and secretary of the Pan-American Society of the United States (1915-19). In 1919 he became again adviser on education in Peru, and assisted in preparing the organic school law of Peru (1910-12) and in putting it into execution (1920). Besides contributing to the *Cyclopædia of Education*, he wrote *The City School District* (1909); *Intellectual and Cultural Relations between the United States and the Other Republics of America* (1914), and *South America* (1916).

**BARDET, GEOFROY** (1852-1923). A French physician and pharmaceutical chemist, distinguished especially as a therapist. Born at Dreux, he spent some years in the laboratory of Wurtz. He received his degree in medicine in 1877 from the University of Paris where his thesis on the soporific alkaloids of opium was crowned by the faculty. After graduation, he became laboratory chief for Dujardin-Beaumetz. With Trillat, he performed an early feat in synthetic chemistry by obtaining the drug later known as urotropin. His major literary activity was the publication at irregular intervals of *Nouveaux Remèdes*, of which 20 volumes were issued between 1886 and 1911. He edited the *Bulletin Général de Thérapeutique* from 1895 to 1917. In his alma mater, he filled the chair of hydrology. Besides his knowledge of medicinal waters, he was known as an expert mineralogist. At the International Medical Congress at Paris in 1889, he functioned as general secretary and chief organizer.

**BARGER, GEORGE** (1878- ). An English physiological chemist, who studied in Holland, at University College, London, and at King's College, Cambridge. In 1909 he was placed at the

head of the chemical department of Goldsmith's College, London, a position he left in 1913 to teach chemistry at Royal Holloway College, University of London. He next joined the staff of the Medical Research Committee, 1914, and in 1919 he became professor of chemistry in relation to medicine at the University of Edinburgh. Dr. Barger contributed to the study of rickets by announcing, in July, 1920, that pure cholesterol is inert, and that ergosterol, activated by radiation, has a preventative quality. His research materially aided Dr. Adolf Windaus who received the Nobel Prize in chemistry in 1928 for proving that ultra-violet rays produce ergosterol, thereby preventing rickets. Dr. Barger wrote *The Simpler Natural Bases* (1914), as well as various scientific papers. He was elected a fellow of the Royal Society in 1919.

**BARGONE, FRÉDÉRIC CHARLES** (1876- ). A French novelist, who wrote under the pseudonym of Claude Farrère. He was born at Lyons, and educated at the lycées of Marseilles and Toulon. Like Pierre Loti, with whom he had many points in common, Farrère entered the French Navy, in which he was serving when he produced his exotic novel, *Les civilisés*, which won the Prix Goncourt for 1905. His succeeding works also dealt with Oriental scenes. He made two attempts to get away from his exoticism, in *Mademoiselle Dar, jeune fille*, (1907), and its sequel *Les petites alliées* (1910), but in the rest of his work he returned to the theme of adventure, in which he sought the manner of Edgar Allan Poe. His other works include *Fumées d'opium* (1904); *L'homme qui assassina*, later dramatized (1907); *La bataille* (1909); *Thomas l'Agnélet* (1913); *Fin de Turquie*, description (1913); *Dix-sept histoires de marins* (1914); *Quatorze histoires de soldats* (1916); *La veille d'armes*, a war play, with L. Népoty (1917); *La maison des hommes vivants* (1919); *Bêtes et gens qui s'aimèrent* (1920); *La dernière déesse* (1920); *Roxelane and La vieille histoire*, plays (1920); *Les hommes nouveaux* (1922); *Combats et batailles sur mer, 1914*, with Paul Chack (1925); *Voyages, 1914-1926* (2 vols., 1926); *Le dernier dicu* (1926); *Une jeune fille voyagea* (1926); *La fin de Psyché*, continuing Pierre Louys' (died 1925) novel *Psyché* (1927), and *L'autre côté* (1928). Many of his books, including *Black Opium* (1929), were translated into English. Consult *Farrère*, by M. Revon (1924).

**BARING, bā'ring or bār'ing, MAURICE** (1874- ). An English author and journalist (see Vol. II). He served throughout the World War in the Air Corps and was made an officer of the Order of the British Empire and, in the following year, a chevalier of the Legion of Honor. In January, 1925, he was granted an honorary commission as wing commander in the Air-Force Officers' Reserve. His later books include *What I Saw in Russia* (1913); *An Outline of Russian Literature* (1914); *Diminutive Dramas* (1919); *Round the World in any Number of Ways* (1919); *R. F. C. H. Q., 1914-1918* (1920); *Passing By* (1921); *The Puppet Show of Memory* (1922); *His Majesty's Embassy* (1923); *C.* (1924); *Collected Poems* (1925); *Cat's Cradle* (1925); *Daphne Adeane* (1926); *Tinker's Leave* (1927); *Comfortless Memory* (1928); *Algæ* (1928). He also made many translations.

**BARING-GOULD, SABINE** (1834-1924). An English author (see Vol. II). His last works include *The Vicar of Morwenstow* (1919), *The*

*Evangelical Revival* (1920), *In the Roar of the Sea* (1920), *Mehalah* (1920), and *Early Reminiscences* (1923).

**BARKER, ELSA** (?- ). An American author, born at Leicester, Vt., and educated privately. She was a teacher, shorthand reporter, and writer for newspapers, lecturer for the New York Board of Education (1904-05), and a member of the editorial staff of *Hampton's Magazine* (1909-10). Besides contributing poems and articles to magazines, she has written novels and volumes of poetry. Her poems, especially those in *The Book of Love* (1912) have received high praise from critics both for their lyric feeling and style. Her prose works, dealing for the most part with spiritualism (*Letters From a Living Dead Man*, 1914, *War Letters from a Living Dead Man*, 1915, and *Last Letters from the Living Dead Man*, 1919) and psycho-analysis (*Fielding Sargeant*, 1922), received less approbation. She wrote also *Songs of a Vagrom Angel* (1916), and *The Scab*, a play produced in New York and Boston (1904-05).

**BARKER, ERNEST** (1874- ). An English philosopher and educationist. He was educated at Balliol College, Oxford, where he remained as fellow lecturer and tutor until 1920. In 1920 he went to London University, where he became principal of King's College and in 1927 he became professor of political science at Cambridge. In 1906 he published his *Political Thought of Plato and Aristotle*, revised in 1918 as *Greek Political Theory*, a work of the first importance, which exerted much influence on the political thought of England. His intimate knowledge of the whole range of political philosophy was displayed in his masterly summary, *Political Thought in England from Herbert Spencer to To-day* (1915). Other works from his pen were *The Dominican Order and Convocation* (1913), articles in the *Cambridge Medieval History*, *Greek Politics* (1923), *The Crusades* (1923), and *National Character* (1927).

**BARKER, HARLEY GRANVILLE** (1877- ). An English playwright, born in London (see VOL. II). In 1915 he had a successful New York season, producing *A Midsummer Night's Dream*, Shaw's *Androcles and the Lion* and *The Doctor's Dilemma*, Anatole France's *The Man who Married a Dumb Wife*, and other plays. The Neighborhood Playhouse achieved success with his *Madras House* (1921) and Winthrop Ames with *Anatol*, from the German of Schnitzler. In 1920, in England, he and his wife produced the *Romantic Young Lady* which they translated from the Spanish of Martinez Sierra. He wrote *Souls on Fifth* (1916), *The Red Cross in France* (1916), *Three Short Plays: Rocco, Vote by Ballot, Farewell to the Theatre* (1917), *The Exemplary Theatre*—"a plea for the recognition of the theatre as an educational force"—(1922), *The Secret Life* (1923), *From Henry V to Hamlet* (1925), *Prefaces to Shakespeare* (1927), and *His Majesty*, a play (1928). He translated *Doctor Knock* (1925) and *Six Gentlemen in a Row* (1927) from the French of Jules Romain. With his wife, Helen Granville Barker, he translated four *Plays of G. Martinez Sierra* published with a critical appreciation of the plays (1923), and *Four Plays by Serafin and Joaquin Alvarez Quintero in English Versions* (1927).

**BARKER, SIR HERBERT ATKINSON** (1869- ). A British manipulative or "bloodless" surgeon, born in Southport. He was a pupil of

Atkinson, a manipulative surgeon, and in 1904 succeeded to Atkinson's practice on the latter's death. His career after 1904 was most successful. Medical opposition was not directed against him personally, and members of the medical profession often referred cases of a certain type to him. His work was largely with orthopaedic patients, especially those having affections of the knee, flat foot, etc. During the World War, the British medical profession opposed the demand to turn wounded soldiers over to Barker's supervision. He was knighted in 1922. In 1927 he published *Leaves from my Life*.

**BARKER, J. ELLIS** (1870- ). An English journalist (see VOL. II). His effort to arouse England to the German peril in the period antecedent to the World War gave his writings of the years 1914-18 a wide audience both in England and the United States. Articles published in the periodical press were collected under the titles *British Statesmanship* (1917) and *Economic Statesmanship* (1918, 2d. ed. with ten additional chapters, 1920). Other works included *Modern Germany* (enlarged edition, 1915), *The Foundations of Germany* (1916), and *America's Secret: The Causes of her Economic Success* (1927).

**BARKER, LEWELLYS FRANKLIN** (1867- ). An American anatomist, born at Norwich, Ont. (see VOL. II). In 1913 he became emeritus professor of medicine at Johns Hopkins University and visiting physician at the Johns Hopkins Hospital. He was president of the National Committee for Mental Hygiene (1909-18) and held high offices in medical societies. As the successor to the late Dr. Osler in the Johns Hopkins Hospital medical clinic, Dr. Barker showed an extensive literary activity like that of his predecessor. In addition to many minor contributions to periodical literature in various departments of internal medicine and neurology, he published *Clinical Medicine, from the Tuesday Clinics of Johns Hopkins* (1916) and *Clinical Diagnosis of Internal Diseases* (1916), comprising three large volumes (of more than 3000 pages) of the medical library known as *Monographic Medicine*. He was also senior editor, with Hopkins and Nosenenthal, of the five-volume system of medicine entitled *Endocrinology and Metabolism* (1922). Other works were *Tuesday Clinics at Johns Hopkins Hospital* (1922), and *The Young Man and Medicine* (1927).

**BARLOW, THE RT. HON. SIR MONTAGUE** (1868- ). An English public official and lawyer. He attended King's College, Cambridge, receiving a number of scholastic honors, and in 1895 he was called to the bar by Lincoln's Inn. Sir Montague lectured at the London School of Economics, and was an examiner in law at London University. Elected to Parliament by the Conservative Party of South Salford in December, 1910, he served continually until December, 1923. After being parliamentary secretary in the Labor Department (1920-22), he was made Minister of Labor in October, 1922, retaining his seat in the cabinet until February, 1924. He was created a Knight Commander of the Order of the British Empire in 1918, a Privy Councillor in 1922, and a first baronet in 1924. In addition to his *Essays on Church Reform*, and *Law of Motor Traction on Highway*, and other works, he wrote *Education Acts* (1902-03).

**BARNARD, EDWARD EMERSON** (1857-1923). An American astronomer (see VOL. II). He re-

ceived the Bruce Gold Medal from the Astronomical Society of the Pacific in 1917.

**BARNARD, GEORGE GREY** (1863- ). An American sculptor, born at Bellefonte, Pa. (see Vol. II). His famous bronze statue of Abraham Lincoln in Cincinnati (1917), with a replica in Manchester, England, caused more discussion than any other American sculpture. Its rugged strength and powerful characterization of the great tribune of the common people placed it in the foremost rank of American sculpture. Other important recent works are "Maidenhood," "Adam and Eve" (Tarrytown, N. Y.; Boston Museum); "Rising Woman" (Metropolitan Museum, New York City); and a heroic head of Lincoln (Bourne Collection, Portland, Oreg.). In 1926 the Metropolitan Museum of Art, New York City, acquired, through the gift of John D. Rockefeller, Jr., "The Cloisters," in the upper part of New York City, in which Mr. Barnard had had his studios and his collection of objects of mediæval European art. The collections were opened to the public as a branch of the museum.

**BARNARD COLLEGE.** The undergraduate college for women in the educational system of Columbia University, New York City, organized in 1889. The student body grew from 733 members in 1914, to 1144 in the spring of 1929; and the faculty from 90 to 119 members. The Ella Weed Library increased from 8600 to 33,000 volumes; and the annual income from \$185,543, to \$764,859 for 1927-28, the income from endowment funds alone, exclusive of scholarship funds, being \$171,982. The productive funds of the College, as of June 30, 1928, were \$4,329,165; the value of grounds, \$1,165,000, of buildings, \$2,348,774; and of equipment, \$194,852. President, Nicholas Murray Butler, Ph.D., LL.D. Litt.D.; Dean, Virginia Crocheron Gildersleeve, Ph.D., LL.D. See also COLUMBIA UNIVERSITY.

**BARNES, THE RT. HON. GEORGE NICOLL** (1859- ). A British labor leader and politician born at Lochie, Scotland. Working as an engineer, he became assistant secretary of the Amalgamated Society of Engineers (1892), and general secretary of the same organization (1896-1906). During this period, he made an unsuccessful attempt to enter political life by contesting Rochdale in 1895. In 1906 he defeated Andrew Bonar Law and represented the Gorbals division of Glasgow until 1922. He was Pensions Minister (1916-18); Privy Councillor (1916), resigning to represent labor in the War Cabinet (1917); Minister without portfolio (1919), and Minister Plenipotentiary to the Paris Peace Conference (1919). In the same year, he attended the International Labor Conference at Washington, U. S. A. He was actively interested in the League of Nations, the Irish question, old-age pensions, and the coöperative movement. He wrote *An Eastern Tour* (1921); *From Workshop to War Cabinet* (1923); *Industrial Conflict: The Way Out* (1924); and *The History of the International Labour Organization* (1926).

**BARNES, JAMES** (1866- ). An American author, born at Annapolis, Md. (see Vol. II). When the United States entered the World War, he was head of the aviation school at Princeton, N. J., and he was subsequently commissioned as major in the Signal Corps of the Army, assigned to the aviation section, and appointed head of the photographic division. He went to France and organized there the

work of making aerial pictures by the Army photographers. At the close of the War, he was commander of the United States school of aerial photography at Rochester, N. Y. In 1915 he published *Through Central Africa from Coast to Coast*.

**BARNOUW, ADRIAAN JACOB** (1877- ). A Dutch educator born in Amsterdam and educated at the Municipal Gymnasium there and the universities of Leyden and Berlin. During 1902-19 he was professor of the Dutch language and literature at the Municipal Gymnasium at The Hague, lecturer in English at the University of Leyden (1902-19), and correspondent at The Hague of the *Nation* (New York). He was associate editor of the *Weekly Review* (1919-21), and professor of the Dutch language and literature at Columbia University (1921- ). Among his works are *Anglo-Saxon Christian Poetry*, translated by Louise Dudley (1914); *Beatrijs, a Middle Dutch Legend* (1914); *Holland under Queen Wilhelmina* (1923), and *Vondel* (1925).

**BAROJA Y NESSI, PRO** (1872- ). A Spanish physician and novelist, born in San Sebastián. He studied medicine in Valencia and earned his doctorate at Madrid (1893). After practicing his profession for two years in Cestona, he moved to Madrid, tried several kinds of business, and established a bakery with his brother Ricardo, the painter and engraver. He gave himself chiefly, however, to journalism (on *El País*, *El Imparcial*, and *El Globo*), and to writing novels. His principal works are *Camino de perfección* (1902); *Idilios vascos* (1902); *El mayorazgo de Labraz* (1903); the three volumes of the trilogy *La lucha por la vida* (1904), a naturalistic work of rebellion against the present social order; *Los últimos románticos* (1906); *Paradoxa, rey* (1906); *Las tragedias grotescas* (1907); *La ciudad de la Niebla* (1909); *El árbol de la ciencia* (1918); *Aurora roja* (1918); *Juventud y egolatría* (2d ed. 1920); *Zalacain el aventurero* (1920); *La casa de Aizgorri* (1920); and *Memorias de un hombre de acción* (1913-1924). He was elected a corresponding member of the Hispanic Society of America.

**BARR, AMELIA EDITH (HUDDLESTON)** (1831-1919). An Anglo-American novelist (see Vol. II). Some of her latest works were *Three Score and Ten* (1915), *The Winning of Lucia* (1915), *Profit and Loss* (1916), *Joan* (1916), *Christine* (1916), and *An Orkney Maid* (1917).

**BARRÈRE, CAMILLE EUGÈNE PIERRE** (1851- ). A French diplomat. As a youth he prepared for a journalistic career and attended the Congress of Berlin as correspondent for a Parisian paper. His articles attracted the attention of Waddington, then French minister of foreign affairs, who offered him a post in the diplomatic corps. He rose rapidly through the ranks and, after serving as Minister to Bavaria, he became French Ambassador to Italy in 1897. He negotiated the commercial treaty of 1898 and in 1915 he won the diplomatic duel with Prince von Bülow and helped to bring Italy into the World War on the side of the Allies. In 1922 he was a delegate to the Lausanne Conference and in 1924, after the fall of Poincaré's ministry, he resigned.

**BARRÈS, BARRÈS, MAURICE** (1862-1923). A French novelist and politician (see Vol. II). During the World War, he devoted his talents to patriotic journalism and published many addresses, lectures, and volumes of propaganda.



His novel, *Un Jardin sur l'Oronte* (1922), was hailed as a masterpiece of romantic fiction. Written only for the most cultivated readers, it transports the imagination to the Holy Land, and develops its theme by describing the love of a Christian knight for a Mohammedan princess. The story of this passion is handled both sympathetically and ironically. His other later works include *La Colline Inspirée* (1913); *La Grande Pitié des Églises Françaises* (1914); *L'Âme Française et la Guerre* (1915); *Les Traits Éternels de la France* (1916); *L'Angoisse de Pascal* (1919); *La Lorraine Dévastée* (1919); *Le Génie du Rhin* (1921); the six-volume *Chronique de la Grande Guerre* (1920-22); and *The Sacred Hill*, translated into English in 1929. In politics, M. Barrès was an advocate of the annexation of the Rhineland to France. Consult *Maurice Barrès*, by E. R. Curtius (1921) and by V. Giraud (1922).

**BARRETT, CHARLES SIMON** (1866- ). An American farm expert, born in Pike county, Ga. (see VOL. II). He was a delegate to many meetings on agricultural subjects in foreign countries. President Wilson appointed him a member of the National Agricultural Advisory Commission; he was also in 1917 a member of the Price Fixing Commission for the wheat crop. As a representative of the National Board of Farm Organizations and the National Farmers' Union, he attended the peace conference at Paris, 1918-19, and he was also a member of the advisory council to the American delegates at the international conference on the limitation of armaments. In 1924 he was a member of the President's agricultural commission.

**BARRETT, JOHN** (1866- ). An American journalist and diplomat, born at Grafton, Vt. (see VOL. II). In 1916 he was delegate of the United States to the Pan-American Scientific Congress and secretary general of the congress. He was presiding officer of the first and second Pan-American Commercial Conferences (1911 and 1919), and was director of the Pan-American Union from 1907 to 1920, when it was reorganized. He was a member of the governing board of the General Committee on Limitation of Armaments (1921-22). Later, he became chairman of the International Pan-American Conference and adviser and arbitrator in domestic and international economic matters. In recognition of his services to Pan-American amity and business intercourse, he was decorated by Venezuela with the Order of the Liberator in 1910 and 1921, and the Chinese government also conferred an order on him for improving Asiatic-American relations. His list of honorary degrees from educational institutions was augmented by that of LL.D. from the University of Panama in 1920. His latest published works include: *Pan American Commerce, Past, Present, and Future* (1919); *Pan America and Pan Americanism* (1922); *The Call of South America* (1924), and articles on Latin-American and Asiatic subjects.

**BARRIE, SIR JAMES MATTHEW, FIRST BARONET** (1860- ). An English author (see VOL. II). He received the Order of Merit in 1922, and in the same year was Rector of St. Andrews University. *Courage*, the rectorial address, was published (1922). His recent work includes *A Kiss for Cinderella* (1916); *The Old Lady shows Her Medals* (1917); *Dear Brutus* (1917); *Echoes of the War* (1918); *A Well-Remembered Voice* (1918); *The Truth about the*

*Russian Dancers* (1920); *Mary Rose* (1920) and *Shall We Join the Ladies?* (1922). In 1926 *Representative Plays* were published. Some of Barrie's novels and plays have been produced in moving pictures very successfully.

**BARRIENTOS, MARIA** (1885- ). A Spanish coloratura soprano, born at Barcelona, Mar. 10, 1885. A remarkably precocious child, she graduated from the Barcelona Conservatory at the age of twelve, having completed the courses in violin, piano and composition. Two years later, after only six months' study under Bennet, she made her operatic début in Barcelona as Selika with such success that she was engaged the following year for La Scala in Milan. Until 1913 she sang in various theatres in Italy and made tours of South America, France, England, Russia, Germany, and Austria. After three years' retirement, she made her New York début at the Metropolitan Opera House as Lucia (Jan. 31, 1916) and sang there till 1920. After that time, she appeared chiefly in Italy and South America. In spite of a rather weak voice, she won success through perfect vocal technic, musical intelligence, and fascinating personality.

**BARROWS, DAVID PRESCOTT** (1873- ). An American ethnologist, economist, and educator, born in Chicago, Ill. (see VOL. II). He became dean of the faculties of the University of California in 1913 and was president of the university, 1919-23. During the World War, he was a member of the Committee for the Relief of Belgium in charge of the food supply of Brussels in 1916 and was major and lieutenant colonel of cavalry in the Army (1917-18). He was on active duty in the Philippine Islands and Siberia, 1917-19. In 1925 he became brigadier general and in 1926 major general of the 79th Infantry Brigade of the California National Guard. For his war work, Dr. Barrows was decorated by the Governments of France, Belgium, Italy, Czechoslovakia, Japan and Poland. He was a member of the board of directors of the California State School for Deaf and Blind (1912-17), a member of the California State Commission on Rural Credit and Colonization (1915-17), and became director of the East Bay Public Utility Commission of the State in 1924. Pomona College conferred on him the degree of LL.D. in 1914, and the University of California did so in 1919. He published *A Decade of American Government in the Philippines* in 1915, and in 1924 a revised edition of *A History of the Philippines* (1st ed., 1903; 2d. ed., 1912). In 1928 Dr. Barrows made a six months' tour of Latin-America as visiting professor of the Carnegie Endowment for International Peace.

**BARRYMORE, ETHEL** (MRS. RUSSELL GRISWOLD COLT) (1879- ). A leading American actress, born in Philadelphia (see VOL. II). Some of her recent performances have been in *The Lady of the Camelias* (1917); *The Offchance* (1918); *Belinda* (1918); *Déclassée* (1919), in which she scored a great success; *Clair de Lune* (1921); *Rose Bernd* (1922); *Romeo and Juliet* (1922); *The Laughing Lady* (1923); *A Royal Fandango* (1923); *The Second Mrs. Tanqueray* (1924); *Hamlet* and *The Merchant of Venice* (with Walter Hampden, 1925), and *The Constant Wife* (1926-27). She also toured in several of Barrie's comedies.

**BARRYMORE, JOHN** (1882- ). An American actor and member of a noted theat-



rical family. He made his début as Max in *Magda* in Chicago in 1903 and in the following December he appeared on the New York stage in *Glad of It*. He next played in London (1905) in *The Dictator* and later in Australia, in the company of William Collier. Since his début, Barrymore has not missed appearing on either the American or the English stage each year. He first attracted serious attention in *Justice* and scored a great success as co-star with his brother Lionel in *The Jest* (1919), but it was in *Richard III* (1920) and *Hamlet* (1922) that his art ripened and his reputation became assured. Among other productions in which he has appeared are *A Stubborn Cinderella*, *Are You a Mason?*, *The Fortune Hunter*, and *Peter Ibbetson*. He has also appeared as leading man in moving pictures, some of his productions being *The Dictator*, *Nearly a King*, *The Red Widow*, *The Lost Bridegroom*, *On the Quiet*, *The Test of Honor*, *The Sea Beast*, *Beau Brummel*, *Don Juan*, *The Beloved Rogue*, and *When a Man Loves*.

**BARRYMORE, LIONEL** (1878- ). An American actor, brother of Ethel and John Barrymore, who made his début in *The Rivals* with his grandmother, Mrs. John Drew, in 1893. He appeared with her also in *The Road to Ruin*. He played in *Squire Kate* (1896), *Cumberland '61* (1897), and in several plays with Nance O'Neil's company. He was two seasons with his uncle, John Drew. Among other plays in which he has acted are *Barrie's Pantaloon* (1905); *Peter Ibbetson* (1917); *The Copperhead* (1918); *The Jest* (1919), all of which were noteworthy successes, especially the last named; in the title rôle of *Macbeth* (1921); *The Claw* (1922), and *Laugh, Clown, Laugh* (1923). He has also appeared as leading man in many screen successes.

**BARTHOLOMÉ, bâr'tô'lô'mâ', (PAUL) ALBERT** (1848-1928). A French painter and sculptor (see VOL. II), who became an honorary member of the Royal Academy in 1921. His later sculptures were in commemoration of the authors and dramatists who died in the World War: in honor of Raymond the aviator at Montbrison; "Le Monument à Paris, 1914-18," Place du Carrousel; "Le monument aux avocats," Palais de Justice, and "1874, Embrasse l'épée de 1918," at Cognac. He was also the designer of the Croix de Guerre of the French government.

**BARTHOLOMÉ, bâr'tô', LOUIS** (1862- ). A French senator, statesman, and man of letters (see VOL. II), who was Minister without portfolio in the Painlevé cabinet (1917). After the Armistice he was instrumental in practically all the governmental overturns in France. He was Minister of War in the Briand cabinet (1921-22), Minister of Justice in the Poincaré government (1922-24), and chairman of the Reparation Commission (1924-26). In 1926 he again became Minister of Justice in the Poincaré cabinet. He represented France at the Genoa Conference of 1922. In 1918, M. Barthou was elected to the French Academy, doubtless on the strength of his *Life of Mirabeau* (1913). Other works include *Lamartine Orateur* (1914), which M. Barthou considered his masterpiece; *Sur les routes du droit* (1917); *Lettres à un jeune Français* (1918); *La Bataille du Marne* (1919); *Les amours d'un poète* (1920), and *Le général Hugo*, the father of Victor Hugo (1926).

**BARTLETT, FREDERIC CLAY** (1873- ). An American painter, born in Chicago. He was educated at private schools in America and

studied art at Munich with Gysis and at Paris with Collin, Aman-Jean, and Whistler. His work includes murals and paintings at the University of Chicago, the Chicago University Club, and the Council Chamber of the Chicago City Hall, a landscape, "Roman Afternoon," at Carnegie Institute, Pittsburgh, and "Blue Blinds," "Evening White," "Canton Street," murals at the Burnham Library of the Art Institute in Chicago. Mr. Bartlett is a member of the National Institute of Arts and Letters. He received a silver medal from the St. Louis Exposition in 1904 and a silver medal from the Panama-Pacific International Exposition, 1915.

**BARTLETT, FREDERICK ORIN** (1876- ). An American writer of popular fiction, born at Haverhill, Mass., and educated in the public schools, at Proctor Academy (Andover N. H.), and at Harvard University. He was a reporter on the *Boston Record* (1900-02) and on the *Boston Herald* (1902-06). He is the author of many realistic novels and short stories of varied character, tales of adventure, and stories for young people, in which he shows unusual skill in handling a plot and in character drawing. His most successful novel was *The Wall Street Girl* (Boston, 1916; New York, 1918). Other works include *Mistress Dorothy* (1901); *Joan of the Alley* (1905); *The Web of the Golden Spider* (1909); *The Forest Castaways* (1911); *The Lady of the Lane* (1912); *Joan and Company* (1919); *Out of the Night* (1923). Under the pen name "William Carleton," he published *One Way Out* (1911); *New Lives for Old* (1913); *The Red Geranium* (1915). *One Year of Pierrot* was published anonymously in 1917.

**BARTLETT, PAUL WAYLAND** (1865-1925). An American sculptor (see VOL. II). His most ambitious work, the pediment group for the House of Representatives (Washington), was completed in 1916. It is composed of 12 colossal figures representing "Democracy Protecting Genius," conceived as typical examples of American laborers. Among his latest and most important works was "Patriotism," a colossal stone statue at Duluth, Minn. Bartlett was elected to the National Academy in 1917. He lived abroad and died in Paris, and he expressed the French tradition in much of his work.

**BARTLETT, ROBERT ABRAM** (1875- ). An American explorer, born at Brigus, N. F. (see VOL. II). In 1915 he returned from the Arctic, after having lost touch with the world for many months and after his vessel, the *Kar-luk*, part of the Canadian government's Arctic expedition of 1913-14, had been crushed in the ice. He commanded the third Crocker Land relief expedition to north Greenland, returning in 1917. In the same year, he was appointed marine superintendent of the United States Army Transport Service at New York. In 1920 he was promoted to the rank of lieutenant commander in the United States Naval Reserve Force. Captain Bartlett was sent in 1925 by the National Geographic Society to locate bases for aircraft in northwest Alaska and on the shores of the Arctic Ocean, and also to study the tides and currents in that region and to dredge for flora and fauna. He headed expeditions to North Greenland and Ellesmere Land in 1926, to Fox Basin and the West Shores of Baffin Land in 1927, and to Siberia in 1928. He received numerous honors from foreign and American geographic societies; they included the Hubbard Gold Medal of the National Geographic Society

(1909); the Kane Medal of the Philadelphia Geographic Society (1910); the gold medal of the Harvard Travelers' Club (1915); the Back Grant of the Royal Geographic Society (1918), in recognition of his work in the Canadian expedition to which reference has been made, and the gold medal of the American Geographic Society. In 1920 Bowdoin College conferred on Captain Bartlett an honorary M.A. He published *The Last Voyage of the Karluk* (1916) and *The Log of "Bob" Bartlett*, an autobiography (1928).

**BARTLEY, NALBRO** (1888- ). An American writer, born at Buffalo, N. Y., and educated at the public high school of that city. She first wrote as a reporter on the Buffalo *Morning Express* (1907-09) and in the latter year went to New York City as a "free lance" writer. She acquired a large following in the popular publications to which she contributes frequently. Included among her works are *Paradise Auction* (1917), *Bargain True* (1918), *A Woman's Woman* (1918), *Gorgeous Girl* (1919), *Careless Daughters* (1919), *Gray Angels* (1920), *Fair to Middling* (1921), *Up and Coming* (1922), *Judd and Judd* (1923), *Bread and Jam* (1924), *Pattycake Princess* (1925), and *Morning Thunder* (1926).

**BARTÓK, BÉLA** (1881- ). A Hungarian composer, born at Nagy Szent Miklos. After studying with Kersch and Erkel, he finished his musical education at the Landesmusikakademie in Pesth, where he has been professor of piano since 1906. As a composer, he exhibits strong futuristic tendencies. He wrote an opera, *Ritter Blaubarts Burg* (Pesth, 1918); a ballet, *Der Wunderbare Prinz* (1919); two dance pantomimes, *Der Holzgeschnitzte Prinz* (1922) and *The Miraculous Mandarin* (1927); a symphonic poem, *Kossuth*; two rhapsodies for piano and orchestra; *Two Portraits* for orchestra; several suites for orchestra; a piano quintet and a string quartet, and pieces for the piano. He has edited piano works of Haydn and Mozart and published a collection of several hundred Hungarian, Slovakian, and Rumanian folk-songs. In 1927-28 he made a successful tour of the United States, appearing as pianist in his own compositions.

**BARTON, BRUCE** (1886- ). An American editor and writer on everyday ethics, born at Robbins, Tenn., and educated at Amherst College. He was managing editor of the *Chicago Home Herald* (1907-09) and of *The Housekeeper* (1910-11); later he became assistant sales manager for P. F. Collier & Son (1912-14), editor of *Every Week* (1914-18), and president of Barton, Durstine & Osborn, an advertising firm of New York. Besides contributing to magazines, he is the author of *The Resurrection of a Soul* (1912); *A Personal Letter to the Kaiser* (1916); *More Power to You* (1917); *The Making of George Groton* (1917); *What Shall it Profit a Man?* (1919); *It's a Good Old World* (1920); *Unknown* (1921); *The Man Nobody Knows* (1925); *The Book Nobody Knows* (1926), and *What Can a Man Believe?* (1927).

**BARTON, GEORGE** (1866- ). An American author and newspaperman, born in Philadelphia, where he began newspaper work with the *Philadelphia Inquirer* (1887) and the *Evening Bulletin*. He returned to the former as an editorial writer after having been secretary to the collector of customs at Philadelphia, 1898-1913. He has contributed over 200 short

detective stories to popular magazines and is the author of many stories for boys. Some of his recent books are *Bell Haven Eleven* (1915), *A Young Knight of Columbus* (1916), *The World's Greatest Military Spies and Secret Service Agents* (1917), *The Mystery of the Red Flame* (1918), *The Pembroke Mason Affair* (1920), *Little Journeys Around Old Philadelphia* (1925), and *Famous Detective Mysteries* (1926).

**BARTON, GEORGE AARON** (1850- ). An American educator and Orientalist born at East Farnham, province of Quebec, Canada (see Vol. II). He was ordained in the Protestant Episcopal Church in 1919. In 1921 he became professor of New Testament literature and language in the Protestant Episcopal Divinity School, Philadelphia, and in 1922 he resigned as professor of Biblical literature and Semitic languages at Bryn Mawr College to become professor of Semitic languages at the University of Pennsylvania. His later published works were *The Origin and Development of Babylonian Writing* (1913); *Sumerian Business and Administrative Documents from the Earliest Times to the Dynasty of Agade* (1915); *Archæology and the Bible* (1916, 5th ed., 1927); *Religions of the World* (1917, 2d. ed., 1919); *Miscellaneous Babylonian Inscriptions, Part I, Sumerian Religious Texts* (1918); *The Religion of Israel* (1918); *Jesus of Nazareth, a Biography* (1922); *The Royal Inscriptions of Sumer and Akkad* (1928); *Hittite Studies No. I* (1928); and *Studies in New Testament Christianity* (1928).

**BARTON, WILLIAM ELEAZAR** (1861- ). An American clergyman and author (see Vol. II). The *Advance*, of which Dr. Barton was editor-in-chief, having been merged with the *Congregationalist*, of Boston, in 1917, Dr. Barton became corresponding editor of the *Congregationalist*. He was moderator of the National Council of Congregational Churches, 1921-23. In 1924 he retired from his ministry at Oak Park, Ill. In 1927 he was a delegate to the World Conference on Faith and Order at Lausanne. For many years, Dr. Barton has devoted much time to research in the biography of Abraham Lincoln and has written several authoritative works on that subject. His later works include *The Law of Congregational Usage* (1915); *Congregational Creeds and Covenants* (1917); *The Parables of Saged the Sage* (1917); *The Soul of Abraham Lincoln* (1919); *Abraham Lincoln and His Books* (1920); *The Paternity of Abraham Lincoln* (1920); *The Life of Clara Barton* (1921); *Life of Lincoln* (1925); *The True Story of Lincoln's Letter to Mrs. Bisby* (1926); *The Great Good Man* (1927); *The Women Lincoln Loved* (1927); *Abraham Lincoln and Walt Whitman* (1928); *Father of His Country* (1928); and *Lineage of Lincoln* (1929).

**BARTSCH, PAUL** (1871- ). A zoölogist born at Tuntshendorf, Germany, and educated at the University of Iowa. On his graduation in 1896, he became associated with the United States National Museum, continuing in positions of increased responsibility until in 1921 he became curator of the division of mollusks, helminths, and cerals. He became director of the histological and physiological laboratories in the Medical department of Howard University (1901- ) and associate editor of *The Osprey* (1900- ). His researches published in the journals of learned societies and government bulletins, have been mainly with the mollusks, par-

ticularly in experimental breeding of terrestrial forms. He was a member of several commissions and expeditions sent out by the U. S. Bureau of Fisheries, by the National Museum, and by the Carnegie Institution of Washington. During the World War, he furnished a poison-gas detector to the Chemical Warfare Service of the U. S. Army.

**BARUCH, BERNARD MANNES** (1870- ). An American financier (see VOL. II). He was a member of the President's conference for capital and labor (1919), and a member of the President's agricultural conference (1922). For his services as an adviser on economics and administrator in the World War, he received the Distinguished Service Medal from President Wilson, and decorations from Belgium, France, and Italy. He received the degree of LL.D. from Williams College in 1923 and from the University of South Carolina in 1925. He was the donor of funds for the International Institute of Politics held annually at Williamstown, Mass. He is the author of many pamphlets, public addresses, etc., on agricultural and economic subjects, and in 1920 published a volume, *The Making of Economic and Reparation Sections of the Peace Treaty*.

**BASEBALL.** The question as to whether baseball is really America's national game is arousing more and more discussion each year. Professional baseball undoubtedly maintains its hold upon those who satisfy their love of sports by watching others get the exercise. The immense gate receipts in the major and minor professional leagues attest the loyalty of devotees. For four years in succession (1923-26), world receipts passed the \$1,000,000 mark, while the total attendance at these games has twice (1923-1926) surpassed 300,000. The town boy, too, apparently is just as eager as ever to get into action with ball, bat, and glove when the season rolls around. Nevertheless, the directors of the destinies of professional baseball are giving indications of worry. The amazing growth in popularity of golf, the lure of the automobile on week ends and holidays, and other diversions are surely having an effect on the national pastime. Then, too, there is no doubt that college baseball is losing ground. The attendance at the important college games in recent years has been falling off rapidly. In an endeavor to remedy this condition, some of the Eastern American colleges have organized themselves into leagues with a championship trophy as the goal. Football, rowing, basketball, and hockey all appear to appeal to the college men more than baseball.

The New York American League club, familiarly known as the "Yankees," captured the world championship both in 1927 and 1928, the Pittsburgh Nationals and the St. Louis Nationals being their respective opponents. A remarkable feature of these two Yankee triumphs was that both were gained by four straight victories.

George Herman Ruth, popularly known as "Babe" Ruth, accomplished in 1927 what experts declared never could come to pass. This mighty batsman knocked out 60 home runs during the regular season of 154 games, thus excelling his own mark of 59, set in 1921.

A list of the pennant-winning clubs for the four years ending with 1928 follows: National League—1925, Pittsburgh; 1926, St. Louis; 1927, Pittsburgh; 1928, St. Louis. American

League—1925, Washington; 1926, New York; 1927, New York; 1928, New York.

Aside from the United States, the countries in which baseball flourishes are Cuba, Mexico, and Japan. College baseball in Japan is making much progress, the leading universities having secured the services of coaches from the United States.

**BASHFORD, ERNEST FRANCIS** (1873-1923). A British physician born at Bowden, England, who became one of the first exclusive cancer students. He was educated at the University of Edinburgh where he gained many scholarships, including the McCosh Graduate Scholarship for study and research in the medical schools of Europe. After two years abroad, he returned to Edinburgh as assistant to the professor of materia medica. He initiated the modern experimental study of cancer, placing the biological and statistical data on a comparative basis. He was made honorary president of the first International Cancer Congress, held at Heidelberg in 1906. He gave lecture courses on cancer at the University of Birmingham in 1911 and in New York City in 1912. In addition to his cancer articles, he wrote many papers on drug action, immunity, biochemistry, wound healing, etc.

**BASKERVILLE, CHARLES** (1870-1922). An American chemist, born at Deer Brook, Miss., and educated at the universities of Mississippi and Virginia, Vanderbilt, and North Carolina. After a term as professor of chemistry at the University of North Carolina, he became professor of chemistry and director of the chemical laboratory of the College of the City of New York in 1904, holding this position until his death. In studying rare earths, he discovered the chemical elements carolinium and berzelium. Other problems of industrial chemistry upon which he undertook productive research were the refining and hydrogenation of vegetable oils, the reinforcing of metals, and the recovery of used paper stocks. In 1912 he received the Longstreth Prize from the Franklin Institute. He was the author of nearly 200 papers, 8 books and 16 patents in the field of applied chemistry.

**BASKETBALL.** This indoor sport is rapidly assuming top rating in the American college world, its chief handicap being the lack of seating accommodations for the ever increasing number of spectators attracted by the more important games. Basketball has outgrown the gymnasium and even the armories in the larger cities are proving inadequate to house the devotees of this pastime. The construction of the Palestra, seating 14,000 persons, by the University of Pennsylvania in 1927 was the first move taken by the larger institutions of the Eastern States to meet the emergency.

Professional basketball also is making headway with the formation of the American League, an organization taking in several Eastern and mid-Western cities. The game flourishes, too, among various religious organizations such as the Y. M. C. A., Y. W. C. A., and Knights of Columbus. Church leagues as well are playing through ambitious schedules each season. Oddly enough, basketball has so far made little progress in European countries.

**BASRA.** See MESOPOTAMIA.

**BASS, CHARLES CASSEY** (1875- ). An American physician, born at Carley, Miss. He studied medicine at Tulane University (1899) and practiced at Columbia, Miss., 1899-1904.

After 1903 he devoted himself to the study of bacteriology. He has done much original investigation in diseases caused by intestinal parasites of man, notably hookworm, malaria, pellagra, etc. In recognition of his work in malaria, etc., he received gold medals from the Medical Association of the State of Mississippi, the Southern Medical Association, the American Medical Association, the Orleans Parish (La.) Medical Society, and the National Institute of Social Sciences. He is the author of *Hookworm Disease*, with G. Dock (1909); *Alveolodental Pyorrhea* (1915) and *Practical Clinical Laboratory Diagnosis* (1917), both with F. M. Johns.

**BASSETT, JOHN SPENCER** (1867-1928). An American historian, born at Tarboro, N. C. (see VOL. II). From 1919 until his death, he was secretary of the American Historical Association. His later works included: *The Plain Story of American History* (1915); *Our War With Germany* (1919); *Selections from the Federalist* (1921) and *The League of Nations; a Chapter in World Politics*, published in 1928, shortly after his death. Professor Bassett also edited, among other works, *Correspondence of George Bancroft and Jared Sparks* (1917) and *The Correspondence of Andrew Jackson* (6 vols., 1925).

**BASSLER, RAY SMITH** (1878- ). An American palaeontologist, born at Philadelphia and educated at the University of Cincinnati. In 1901 he became connected with the United States National Museum, in which since 1911 he has been curator of palaeontology. Since 1904 he has been assistant professor and professor of geology at George Washington University. With Ferdinand Canu, he published three quarto volumes of the Cenozoic Bryozoa of North America and made these early forms of life available for stratigraphic and economic purposes. In 1910 he became secretary of the Palaeontological Society of America.

**BASTIN, EDSON SUNDERLAND** (1878- ). An American geologist and educator, born at Chicago, Ill., and educated at Michigan and Chicago universities (1902 and 1903). From 1904 to 1916, he was connected with the United States Geological Survey, making investigations in Maine and the Western States, and in 1916-17 he was engaged in the investigation of copper properties in Chile. From 1917 until 1919, he served the Government of the United States in accumulating information concerning mineral resources, and from 1919 to 1920, he was chief of the division of mineral resources of the United States Geological Survey. Since 1920 he has been professor of economic geology at the University of Chicago, and since 1922 also chairman of the department of geology. He is the author of numerous government reports and of articles in geological and mining journals.

**BASUTOLAND.** A British native protectorate in South Africa under the control of the British Colonial Office, administered by a resident commissioner under the direction of the high commissioner for South Africa. It has an area of 11,716 square miles. The census of 1921 showed a native population of 495,937; 1603 Europeans, 172 Asiatics, 1060 colored. Maseru, the capital, had 1890 natives and 399 Europeans. The increase in the European population over 1911-21 was inconsiderable because of prohibitions on white settlements. Education advanced steadily under missionary administration, in 1926 there being 531 native schools with 44,252 pupils. The exports of Basutoland, which is in

the South African Customs Union, amounted to £696,950 in 1926 and imports to £665,014. Leading exports are grain, cattle, wool, mohair. Leading imports are blankets, ploughs, clothing, iron, and tinware. The district supports its own administration, deriving its funds mainly from a native poll tax and customs. An income tax in 1926-27 brought in £10,784. Revenues in 1913-14 were £161,417 and expenditures, £203,461; in 1926-27 these were £274,404 and £272,627. The native Basutos continued orderly during and after the World War and many saw service in France and Africa in labor contingents. To the question of annexation by the Union of South Africa, however, they are constantly opposed.

**BATAILLE, (FÉLIX) HENRI** (1872-1922). A French playwright, one of the foremost figures of the French stage during the decade 1914-24, born at Mimes, and educated at the Lycées Henri IV and Janson de Sailly at Paris. His first play, *La Belle au bois dormant*, was brought out in 1894, and his first great success came with the publication of *Maman Colibri* in 1904. Though the plot was rather repelling, *Maman Colibri* triumphed by the sheer charm of Bataille's art and the manner in which he idealized his heroine. *La Marche nuptiale* (1905) was regarded by many as the best of his earlier works. A new side of his talent was displayed in *L'Amazone* (1910), inspired by the World War, treating of the struggle between the material and the spiritual. There is in Bataille's plays the reflection of a distinct individual temperament. In addition to the works mentioned, Bataille's publications include *La Lépreuse* (1896), a tragedy; *Ton Sang* and *L'Enchantement* (1900); *Poliche* (1906); *Les Flambeaux* (1912); *La Phalène* (1913); *Notre Image*, and *Les Sœurs d'Amour* (1919); *L'Homme à la Rose* (1920); *La Tendresse* (1921); *La Possession* (1922), and *La Chair Humaine* (1922). He also wrote verse: *La Chambre Blanche* (1895); *La Divine Tragédie* (1916), and *La Quadrature de l'Amour* (1920). Consult *Henri Bataille*, by E. Gaubert (1908), and by P. Blanchart (1922).

**BATES, HENRY MOORE** (1869- ). An American lawyer and educator born at Chicago and educated at the University of Michigan (1890) and the law school of Northwestern University (1892). After practicing law in Chicago, 1892-1903, he became Tappan professor of law at the University of Michigan and was made dean of the law school there in 1910. In 1917-18 he was professor of law at the Harvard Law School after which he returned to his former post at the University of Michigan. In 1921 he was appointed a commissioner on uniform State laws. He was president of the Association of American Law Schools (1912-13), a member of the executive committee of the American Institute of Criminal Law (1911-14), and president of the Order of the Coif (1913-16). He received the degree of LL.D. from Kalamazoo College in 1925.

**BATES, LINDON WALLACE** (1858-1924). An American civil engineer (see VOL. II). He was chairman of the engineering committee of the Submarine Defense Association in 1917.

**BATES COLLEGE.** A non-sectarian institution for the higher education of men and women at Lewiston, Me., founded in 1864. From 1914 to 1928, the student body increased from 450 to 615 (in the autumn session), with an additional enrollment of 229 in the summer session; the

faculty increased from 33 to 50; and the endowment from \$800,000 to \$1,800,000. The library in 1928 contained 55,732 volumes. During this period Bates College claimed unique records in the fields of education, in that 46 per cent of its more than 2600 living alumni were engaged in teaching in 1923-24, and that it had provided more than twice as many high-school principals in New England as any other college; while in debating, it was the first American college to send a team to England, and the first to debate an English university in the United States,—from which beginnings grew a new institution of international debating. In 1927-28, a Bates team, which was sent around the world, met representative teams at some 25 leading universities of New Zealand, Australia, South Africa, and Great Britain. A new department of instruction, that of music, with Prof. Seldon T. Crafts at the head, was installed in 1925, and courses in appreciation and history of music were offered, besides supervision of all college musical activities; a new system of honors courses for superior students was adopted by the faculty in the following year, and further developed and improved in subsequent years. In 1925 a new indoor athletic building for men and women students, a \$150,000 gift from William Bingham, 2d, of Bethel, Me., was started; in 1926 a chemical laboratory and a physical education plant were constructed; in the year 1926-27 the laboratory and Libbey Forum underwent alterations to provide additional recitation facilities, and the year 1927 saw further renovations, providing for more classrooms and offices. For 55 years, Bates had but two presidents. The third president, Clifton Daggett Gray, Ph.D., LL.D., assumed office in May, 1920, following the death of George Colby Bates, D.D.

**BATESON, WILLIAM** (1861-1926). An English zoölogist, born at Whitby and educated at St. John's College, Cambridge. He was Silliman Lecturer at Yale University (1907); professor of biology at Cambridge University (1908-09); Fullerton professor of physiology in the Royal Institution (1912-14) and president of the British Association for the Advancement of Science (1914). In 1910 he became director of the John Innes Horticultural Institution, and in 1922 a trustee of the British Museum. As the guest of the American Association for the Advancement of Science, he delivered the principal address at the meeting held in Toronto in December, 1921. His most important earlier researches dealt with various phases of the theory of evolution; the most important of the results appeared as *Materials for the Study of Variation* (1894). After 1900, he was prominently identified with the Mendelian study of genetics and was regarded as the leading English authority on this subject, maintaining in opposition to the biometricians that only through the Mendelian technique could accurate results in heredity be obtained. Besides numerous shorter papers, he published *Mendel's Theory of Heredity* (1902), *Problems in Genetics* (1915), and *Mendel's Principles of Heredity* (1920). In 1928 his widow, Beatrice Bateson, published *William Bateson, F.R.S. Naturalist: his Essays and Addresses; together with a short account of his life*.

**BATTALION.** See ARMIES AND ARMY ORGANIZATION.

**BATTISTI, CESARE** (1875-1916). An Italian author and patriot, born at Trent, Austria,

and educated at Vienna, Gratz, and Florence. He devoted himself to geographical science and particularly the history of the Trentino, and was at one time a member of the Austrian upper house. When Socialism made its appearance in Italy, he became an enthusiastic supporter, and edited, with Mussolini as an assistant, the Socialist daily, *Il Popolo*, working for the autonomy of the Trentino, the cessation of Austrian interference, and subsequently the intervention of Italy against Austria. For his views he was many times imprisoned by Austrian authorities. In 1915 he entered the Italian army and in July, 1916, while commanding a company of the Vicensa Battalion, was wounded at Monte Corno, and subsequently died. He wrote *Il Trentino, Saggio di Geografia, Fisica e d'Antropogeografia; Termini Geografici Raccolti nel Trentino*, among others.

**BATTLE CRUISER.** See VESSEL, NAVAL.

**BATTLESHIP.** See VESSEL, NAVAL; ELECTRIC SHIP PROPULSION.

**BATTLES OF THE FRONTIER.** See WORLD WAR.

**BAUCH, BRUNO** (1877- ). A German philosopher and Kantian scholar, born in Schleswig and educated at the universities of Freiburg, Strassburg, and Heidelberg. He studied mathematics, natural science, and philosophy and became associated with the neo-Kantian group of Hermann Cohen. His first work, *Glückseligkeit und Persönlichkeit in der Kritischen Ethik*, earned him a reputation in philosophical circles. On the occasion of the Kantian anniversary, he published *Luther und Kant* in 1904, and shortly afterward wrote a volume on Schiller. Among his other works are a philosophical biography of Kant and *Fichte und Unsere Zeit* (1920). Contrary to the tendency before the World War, Professor Bauch presents Fichte as a champion of republican ideals and opposed to military Pan-Germanism. His recent works include *Jena und die Philosophie des deutschen Idealismus* (1922) *Wahrheit, Wert, und Wirklichkeit* (1923), *Das Naturgesetz* (1924), *Fichte und der deutsche Staatsgedanke* (1925), *Die Idee* (1926) and *Der Geist von Potsdam und Weimar* (1926).

**BAUER, LOUIS A. (GRICOLA)** (1865- ). An American magnetician, born in Cincinnati, Ohio (see VOL. II). He was Halley lecturer on terrestrial magnetism at Oxford University in 1913, a member of the National Research Council in 1917, and chairman of the committee on navigation and nautical instruments of the Council of National Defense, 1917-18. He was United States delegate to several international meetings of scientists, and has held office and membership in numerous foreign and American associations. In 1905 he received the Charles Lagrange Prize of the Royal Society of Sciences, Letters, and Arts of Belgium, and in 1913 the George Neumayer Gold Medal in Berlin. The University of Cincinnati (1913) and Brown University (1914) made him an honorary Doctor of Science. He has written many articles for the scientific press on terrestrial magnetism, physics and kindred electricity and kindred subjects.

**BAUER, OTTO** (1881- ). An Austrian Socialist politician. He was a member of the faculty of jurisprudence at the University of Vienna, where he devoted himself to the study of economics. After being held a prisoner of war in Russia (1915-17), he returned to



Vienna and in November, 1918, after the revolution, he became an influential leader of his party, bent on the union of German Austria with Germany. He retired from office in 1919 but subsequently was recognized as a power in the Constituent National Assembly and in the National Parliament (Nationalrat). His works include *Die Nationalitätenfrage und die Sozialdemokratie* (Vienna, 1907); *Die Russische Revolution und das Europäische Proletariat* (1917); and *Bolschewismus oder Sozialdemokratie?* (1920).

**BAUMANN, EMILE** (1885- ). A French Catholic novelist and critic whose work shows the influence of Bourget and Claudel. His novel, *Job le prédestiné*, which shared the Prix Balzac in 1922, was mystical in spirit, like his much discussed *L'Immolé* (1909). His other works include *Les grandes formes de la musique*. *L'œuvre de Camille Saint-Saëns* (1905); *La fosse aux lions* (1911); *Trois Villes saintes* (1912); *La paix du septième jour*, short sketches (1918); *Le fer sur l'enclène* (1920); *L'Anneau d'or. Des grands mystiques* (1924); *Saint Paul* (1925); *Le signe sur les mains* (1926), and *Mon frère le Dominicain* (1927). Consult *Idees et Portraits* by Louis Bertrand (1927).

**BAUMER, GERTRUD** (1873- ). A philologist, teacher, lecturer, and active worker in the woman's movement of Germany. She was born in Berlin, where she studied at the university. She is the author of some philological works, *Die Soziale Idee und die Weltanschauungen des neunzehnten Jahrhunderts* and *Handbuch der Frauenfrage* (in collaboration with Helene Lange). She edited *Die Hilfe* and *Die Frau*, was elected member of the Diet (1918), and became councillor in the Cabinet of the Interior.

**BAUMGARTEN, boum'gär-tën, OTTO** (1858- ). A German theologian who was born at Strassbourg, Göttingen, Heidelberg, and Zürich. He was editor of *Evangelische Freiheit* and of the *Monatsschrift für kirchliche Praxis*, published *Evangelisch-Soziale Zeitfragen*, and wrote, among other works, *Religiöses und kirchliches Leben in England, Politik und Moral, Carlyle und Goethe*.

**BAUXITE**, bôks'it. In 1927 the United States produced 320,940 long tons of bauxite, valued at \$1,988,780. Bauxite is the most important ore-mineral of aluminium, and is also being used to an increasing degree in the chemical and abrasives industries, as well as in the production of aluminous cements. In 1914 the United States output of bauxite was 219,318 long tons valued at \$1,069,194. In 1918 domestic production exceeded 600,000 long tons, whereas in 1920 and in 1923, it was in excess of 500,000 long tons. The 1923 output of 522,690 long tons was an increase of more than 72 per cent in quantity, and 56 per cent in value, over the domestic production in 1922. However, the 1927 production figures represent a decrease of 18 per cent in quantity and in value from the 1926 output. Arkansas continued to hold first place as a producing State in 1927 with an output of 303,830 long tons as against 371,570 long tons produced in 1926 and 493,880 long tons, in 1923. No bauxite was produced in Alabama during 1924, 1925, or 1926; in 1927 some bauxite was produced in the Eufaula district of Barbour County, Alabama. Domestic bauxite brought from \$5. to \$6.50 a long ton in 1927, the average for the Arkansas output being \$6.23 per long ton, for Alabama, \$6.06, and for Georgia,

\$5.46. These figures are believed to represent production costs very closely as the greater part of the domestic bauxite is produced by the same interests that own the consuming plants.

Imported bauxite, particularly from South America, increased in importance to domestic consumers and increased in volume and value from 119,202 long tons, valued at \$503,882 in 1923 to 356,580 long tons valued at \$1,572,236 in 1927. Other sources of supply during this period were Dalmatia and France. A large proportion of the bauxite imported from British and Dutch Guiana entered the United States through ports on the Gulf of Mexico and was used in the production of aluminium metal, and a smaller proportion was shipped to North Atlantic ports for utilization in the chemical and abrasives industries. Because of the extent, quality, and low production costs of the deposits in these South American countries, their bauxite has taken the place of the domestic product except in cases where domestic exploitation is particularly favorable.

Exports of bauxite and bauxite concentrates increased from 78,560 long tons valued at \$3,380,486 in 1923, to 121,858 long tons valued at \$7,800,491 in 1927, the largest gain taking place in 1926 and 1927 in response to increased demands of the Canadian and Norwegian plants of the Aluminium Company of America.

#### BAUXITE PRODUCED AND CONSUMED IN THE UNITED STATES IN 1923 AND IN 1927

According to U. S. Bureau of Mines  
[In long tons.]

Year	Domestic Production	Imports	Exports	Apparent Consumption
1923	522,690	119,020	78,560	563,150
1927	320,940	356,580	121,858	555,662

#### DOMESTIC BAUXITE CONSUMED BY UNITED STATES INDUSTRIES IN 1923 AND IN 1927

According to U. S. Bureau of Mines  
[In long tons.]

Year	Aluminium	Chemicals	Abrasives Alumina and Cement Refractories	Total
1923	380,518	68,872	73,300	522,690
1927	186,490	62,410	71,950	320,940

**BAVARIA.** During the World War, the well-known Bavarian particularistic tendencies were kept in check by a steadfast loyalty to the Empire, in spite of the fact that the enemies of Germany attempted to use these aspirations toward breaking the unity of the Empire. Upon assuming the office of German chancellor in November, 1917, Count Hertling was succeeded as Bavarian prime minister by von Dandl. The latter's offer of electoral reform, advanced in the Diet in October, 1918, came too late in the face of the German crisis. The November revolution of 1918 resulted in the deposition of the dynasty and the proclamation of the Republic. On November 8, the Soldiers' and Workers' Council in Munich elected the radical Socialist, Kurt Eisner, Prime Minister. Eisner wished to swing Bavaria far to the left and acceded to the urgent request for elections to the Bavarian Constituent Assembly only after he had provided in advance through ordinance for the establishment of a powerful Socialist government. The elections of Jan. 9, 1919, resulted in the following party divisions in the Assembly: Bavarian People's Party (successor of the Bavarian Catholic Centre) 66, Socialists 62, Democrats 25,



German People's Party and German National Party 9, Farmers' League 15. On February 21, the date of the convocation of the Assembly, Kurt Eisner was assassinated by a former army officer and, in consequence, a period of disorder and lawlessness ensued in which the official Socialist Party and the provinces were at odds with the Munich Soviets who attempted to usurp all power. After much conflict a new ministry was formed by the Socialist, Hoffmann, and, in view of the threatening situation in the capital, the Government and the Assembly were transferred to Bamberg in Northern Bavaria. Meanwhile, the Munich revolutionary councils set up a Soviet republic which was ruthlessly suppressed.

With the overthrow of the Soviets and the return of the Hoffmann government to Munich, the slow but steady process of reaction in Bavaria began. At the time of the Knapp Putsch (March, 1920), the reactionary movement had progressed to a point where the Socialist government could be replaced by a bourgeois coalition under von Kahr, consisting of the Bavarian People's Party, the Democrats, and the Farmers' League. The elections for the Diet on June 6, 1920, showed a further swing to the right. Thereupon, von Kahr reorganized his cabinet so as to include men more fully in sympathy with his own reactionary views. During 1921 the existence in Bavaria of secret military organizations in violation of the Versailles Treaty led to a serious dispute between the Berlin and Munich governments, as a result of which von Kahr resigned on Sept. 12, 1921, and was succeeded by Count von Lerchenfeld. The new premier represented a more liberal viewpoint and reached subsequently a satisfactory agreement with the Government of the Reich. This turn toward moderation, however, was the result merely of pressure from without and had little effect on Bavarian reaction, which continued to grow daily in strength. The Lerchenfeld government found too little support in the country to cope with the secret military societies and the solid nationalist organization against treaty-enforcement and democracy. Moreover, Bavaria became a haven for all the extreme monarchist elements in Germany and henceforth all nationalist opposition to the Republic had its headquarters in Munich.

In consequence of the activities of the Bavarian reactionaries, in 1922 the Reich came into conflict with the Allies. Count von Lerchenfeld, whose liberal tendencies lacked the support of the majority of the Bavarian people, was forced to resign early in November of the same year and a strongly monarchist government was formed by von Knilling with a programme of opposition to the fulfillment of the Peace Treaty. Under the influence of the reparation policy of the Allies and particularly of the developments in the Ruhr, Bavarian reaction and nationalism blazed forth in 1923 into a violent flame. The National Socialists with a programme of extreme nationalism and anti-Semitism sought refuge in Bavaria and under the leadership of Adolf Hitler formed activist organizations without interference from the Bavarian government. On Sept. 26, 1923, the Knilling ministry suspended civil law and appointed von Kahr General State Commissioner with the powers of a dictator. Kahr and his lieutenant, General von Lossow, the commander of the Bavarian Reichswehr, took a stand against the laws and decrees of the Reich, especially against the "Law for the Defense of the Republic." A tense situation be-

tween Bavaria and the Reich resulted therefrom, which on the part of Bavaria took the form of direct refusal to recognize the authority of the Berlin government. Only the utmost caution and considerable sacrifice of principle on the part of the central government prevented open hostilities between the Reich and the recalcitrant state. To make matters even more complicated, the National Socialists under Ludendorff and Hitler executed on Nov. 8, 1918, their ludicrous "Beer Hall" Putsch. Kahr and Lossow, who at first had taken part in the affair but later claimed that they had been forced into such action by threats, suppressed the movement on the following day by military force and arrested the ringleaders. This procedure, however, by no means met with the approval of Nationalist Bavaria and, in consequence of his stand in the affair, Kahr's position in the Diet was considerably weakened. Hence, Kahr and Lossow resigned in February, 1924, and the full conduct of the government was again taken over by the Knilling ministry. During the following month, the farcical trial of the perpetrators of the "Beer Hall" Putsch gave the world a fair view of the strength of Nationalism in Bavaria.

On Aug. 14, 1919, Bavaria adopted a new constitution, which conformed with the provisions of the constitution of the Reich. According to this document, the supreme power lay with the people. The executive power was vested in a ministry taken as a whole and the legislative power in a single-chamber diet, elected for four years by all Bavarian citizens, male or female, of 20 years of age, on the basis of one member for every 62,000 inhabitants. Provision was made for the application of the system of proportional representation and for equal, direct, and secret suffrage. Under the constitution of the Reich, Bavaria was shorn of its special military, financial, railroad, and postal privileges. See GERMANY.

**BAWDEN, WILLIAM THOMAS** (1875- ). An American educator, born at Oberlin, Ohio, and educated at Denison University, the Mechanics Institute of Rochester N. Y., and Teachers College of Columbia University. After teaching in various schools, he was director of the Manual Training Department of the Illinois State Normal University (1903-10), assistant dean of the College of Engineering of the University of Illinois (1910-12), specialist in industrial education of the United States Bureau of Education (1914-19), and assistant to the commissioner (1919-23). He became associate superintendent of Schools at Tulsa, Okla., in 1923 and since 1909 has edited the *Manual Training Magazine*, later changed to the *Industrial Education Magazine* (Peoria, Ill.).

**BAX, ARNOLD (E. TREVOR)** (1883- ). A British composer, born in London. From 1900 to 1905 he studied at the Royal Academy of Music with Tobias Matthay (piano) and Frederick Corder (composition). He has written *Festival Overture*; the symphonic poems *Into the Twilight*, *In the Fairy Hills*, *Christmas Eve on the Mountains*, *The Garden of Fand*, *November Woods*, *In Memoriam*, and *Tintagel*; choral works with orchestra, *Fatherland* and *Enchanted Summer*; a Symphony in E flat minor; chamber music, piano pieces, and songs.

**BAYES, GILBERT** (1872- ). An English sculptor, born in London. He received the gold medal and a traveling scholarship from the Royal Academy in 1899. Examples of his work

were purchased by the Dresden National Museum the following year, and by the Royal Academy, with the Chantrey Bequest, in 1910, and were added to permanent collections in Preston in 1920, Liverpool in 1921, and Dunedin in 1926. Besides his portrait figures, which include that of King George V, Bayes designed decorative pieces, often with a horse as the motif. Among these are the bronze equestrian statues of War and Peace at the National Art Gallery in Sydney. He won honorable mention at the Paris International Exhibition in 1900, and a *diplôme d'honneur* and gold medal at the international exhibition of decorative art at Paris in 1925. See SCULPTURE.

**BAYLISS, SIR WILLIAM MADDOCK** (1860-1924). A British physiologist, born at Wednesbury, Staffordshire, and educated at Oxford and the University of London. He was appointed professor of general physiology in the University of London and, with Harden, edited the *Biochemical Journal*. He delivered the Hertzer Lectures at the New York Academy of Medicine in 1922. His principal writings are *The Principles of General Physiology* (1915); *Nature of Enzyme Action* (1908); *Physiology of Food and Economy of Diet* (1917); *Intravenous Injection and Wound Shock* (1918); *Introduction to General Physiology* (1919); *The Vaso-motor System* (1923), and *Interfacial Forces and Phenomena in Physiology* (1923).

**BAYREUTH FESTIVAL.** See MUSIC, under Festivals.

**BAYS, ALFRED WILLIAM** (1876- ). An American lawyer, born at Vermont, Ill., and educated at Knox College and the School of Law of Northwestern University. He was appointed lecturer at the university in 1905 and was advanced progressively until he became professor of law in 1912; at the same time he continued his general practice in Chicago. He is author and compiler of the *American Commercial Law Series*, 9 vols. (1911-12; 2d ed., 1920-22), *Cases on Commercial Law* (1914; 2d ed., 1923), *Business Law* (1919; 2d ed., 1925).

**BAZIN, bā'zān', RENÉ (FRANÇOIS)** (1853- ). A French Catholic novelist and man of letters (see VOL. III). *Les Nouveaux Oberlé* (1919) treating of the patriotism of the Alsations, handled in a simple manner, was regarded as a masterpiece. His other works include *Mémoires d'une vieille fille*; *L'Abandonné* (1914); *Récits du temps de la guerre* (1915); *La closerie de Champdolent* (1917); *Le mariage de Mlle. Gimel*; *La barrière*; *Histoire de vingt-quatre sonnettes*; *Ferdinand Jacques Hervé Bazin* (1921); *Charles de Foucauld, explorateur* (1921; tr. 1923); *Il était quatre petits enfants*, for children (1923); *Le conte du triolet* (1924); *Paysages et pays d'Anjou* (1926); *Baltus le Lorrain* (1926), and *Fils de l'église*, a history of the Roman Catholic Church (1927). Consult *René Bazin*, by Charles Baussan (1924).

**BEAL, ALVIN CASEY** (1872-1928). An American floriculturist, born at Mt. Vernon, Ill., and educated at Illinois and Cornell universities. From 1900 to 1908, he was instructor of floriculture at the University of Illinois, and from 1913 to 1928, professor of floriculture at Cornell. He was a member of many floricultural societies and wrote numerous research bulletins and articles. In his later years, he specialized in the development of gladioli and in 1927 wrote *The Gladiolus*, a standard work of its culture.

**BEAL, GIFFORD REYNOLDS** (1879- ). An

American painter, born in New York, who studied with Chase, DuMond, and Ranger. He was elected an Academician in 1914 and he took prizes at the Academy in 1910, 1913, and 1919. In 1913 he took a medal at the Art Institute of Chicago and at the Corcoran Gallery, Washington, D. C., and in 1915 he was awarded a gold medal at the Panama-Pacific International Exposition at San Francisco. Among his many awards is included the gold medal of the National Arts Club (1918 and 1925). Beal is a versatile colorist. His subjects are taken from many fields and moods. His circus pictures had a peculiar *réclame*. Of another genre are his garden scenes, peopled with ladies in crinolines and dandies of long ago. Later pictures show gain in organization. His best known work includes "Mayfair" and "The Albany Boat," in the Metropolitan Museum (New York), and "A Puff of Smoke," in the Art Institute (Chicago). He is represented also in the Syracuse, San Francisco, and Detroit museums.

**BEARD, CHARLES AUSTIN** (1874- ). A prominent American historian and publicist (see VOL. III). After 1914, Mr. Beard's work assumed increasing importance. His insistence on the part played by economics in the development of America's institutions was recognized by American scholars as a major contribution to historical thought. He projected an ambitious study of the interrelations between politics and economics in American life, with *The Economic Interpretation of the Constitution* (1913) and a continuance of its story in *The Economic Origins of Jeffersonian Democracy* (1915). These works not only received the commendation of scholars but also were read widely, for Mr. Beard's stylistic talents are considerable. These factors enhanced the popularity of his other works; his *Contemporary American History* (1914) and *The History of the United States* (1921), are used as general texts by schools throughout the country. In 1917 he gained prominence by his stand for academic free speech; his resignation from Columbia University was a protest against the dismissal of two of his colleagues. His interest in contemporary social and educational problems then led him to affiliate himself with the Bureau of Municipal Research (New York) and later with the New School for Social Research. He wrote prolifically on many historical and allied themes, his works including the excellent *Economic Basis of Politics* (1922), *Cross Currents in Europe Today* (1922), *Administration and Politics of Tokyo* (1923), and *The American Party Battle* (1928), besides several textbooks for schools. With his wife, Mary Ritter Beard (q.v.), he wrote *The Rise of American Civilization* (1927), one of the outstanding books of its decade. He was editor of *Whither Mankind: A Panorama of Modern Civilization* (1928).

**BEARD, MARY RITTER (MRS. CHARLES A.)** (1876- ). An American writer and suffrage leader, born at Indianapolis and educated at DePauw and Columbia universities. She was editor of *The Woman Voter* until 1912, a member of the executive committee of the Congressional Union for Woman Suffrage, and former vice chairman for Manhattan of the Woman Suffrage Party of New York. She is the author of several excellent historical surveys, *American Citizenship*, with her husband (1913), *Women's Work in Municipalities* (1915), *A Short*

*History of the American Labor Movement* (1920), a useful and readable summary; and, in collaboration with her husband, *History of the United States* (1921) and *The Rise of American Civilization* (1927).

**BEAR ISLAND.** A desolate arctic island at 74° 30' North Lat. and 19° East Long, about 200 miles off Norway, which officially took possession of it Aug. 14, 1925. Its economic value lies in the coal mines. This coal, which has coking properties, supplements Spitzbergen coal in the industries of Norway. The population is largely seasonal, ranging from 260 in the summer of 1923 to 82 in the winter of 1923-24. See **SPITZBERGEN**.

**BEATTY, bē'tī, DAVID BEATTY, FIRST EARL OF** (1871- ). A British admiral born in County Wexford, Ireland. He entered the navy in 1884, served with the Nile flotilla in 1896, participated in the advance on Peking in 1900, acted as aide-de-camp to Edward VII in 1908 and as naval secretary to the First Lord of the Admiralty in 1912, when he was made commander of the First Battle Cruiser Squadron. The outbreak of the World War gave him the opportunity for independent command. He distinguished himself in the naval battles of Heligoland Bight (Aug. 28, 1914), Dogger Bank (Jan. 24, 1915), and Jutland (May 31, 1916), where his direction of the battle cruisers was characterized by spirit and enterprise. In December, 1916, he was raised to the post of commander-in-chief of the Grand Fleet, in succession to Sir John Jellicoe. In 1919 he received a peerage, the Order of Merit, and was made First Sea Lord, a position which he held until 1927. Then he became Privy Councillor. He married, in 1901, Ethel Field, the daughter of an American, Marshall Field.

**BEATTY, EDWARD WENTWORTH** (1877- ). A president of the Canadian Pacific Railway Company, born at Thorold, Ont., and educated at Upper Canada College, the Model School of Toronto, Harbord Collegiate Institution (Toronto), Toronto University, and Osgoode Hall Law School. After reading law in a Toronto office, he was called to the Ontario Bar in 1901, and in the same year was appointed assistant in the law department of the Canadian Pacific Railway. He became assistant solicitor in 1905, general solicitor in 1910, general counsel in 1913, vice president in 1915, King's counsel for Ontario in 1915, King's counsel for the Dominion in the same year, and director of the company in 1916. He was constituted a member of the executive committee in 1916 and was elected president in 1918. He was chancellor of Queens University, Kingston, Ont., (1919-23) and has been chancellor of McGill University, Montreal, since 1921.

**BEAUX, CECILIA** (1863- ). An American painter (see VOL. III). She won the Saltus Medal from the National Academy of Design in 1914; medal of honor from the Panama-Pacific International Exposition (1915); the Proctor Portrait Prize from the National Academy of Design (1915); the National Arts Club Prize of the N. A. Women Painters Society (1917); and the Logan Medal from the Art Institute of Chicago in 1921. She is represented in the Metropolitan Museum of New York, the Boston Art Museum, and the Art Institute of Chicago.

**BEAUX-ARTS, bō'zār, INSTITUTE OF DESIGN.** This institute was organized in 1916 by members of the Society of Beaux-Arts Archi-

tecs who had formerly attended the École des Beaux Arts of Paris. It was formed in order to carry on the educational work which had developed from the original social club of the Society of Beaux-Arts Architects. The main courses were in architecture, but this was supplemented by important courses in sculpture, mural painting, and interior decoration. The institute now serves as a clearing house for advanced architectural design in the majority of big architectural schools in the United States, from California to New York, and its number of pupils has increased from about 1100 in 1914 to 2077 in 1928. Building, 304 East 44th Street; Director, Whitney Warren, 16 East 47th Street, New York, N. Y.

**BEAVERBROOK, RT. HON. WILLIAM MAXWELL AITKEN, FIRST BARON OF** (1879- ). A British politician and owner of the London *Daily Express* and its associated newspapers, who was born in New Brunswick, Canada, and educated at the public school there. A firm believer in the British Empire, after amassing a fortune in the cement business, he went to England in 1910 and entered Parliament as a Unionist, being knighted in the next year, and raised to the peerage in 1916. In that year, he was the official representative of the Canadian government at the front, then he was in control of the Canadian War Records (1917), and in 1918 he entered the cabinet as Chancellor of the Duchy of Lancaster and Minister of Information. Through his personal influence, that of his press, and the power of his large fortune, he played a leading part in political events during the World War and post-war period. He wrote *Canada in Flanders* (2 vols, 1916-1917), *Success* (1921), *Politicians and the Press* (1925), and *Politicians and the War* (1928).

**BEAZLEY, CHARLES RAYMOND** (1868- ). An English geographer and historian (see VOL. III). In 1918 he made another visit to America to lecture on the British armies in France. Beazley was elected an honorary vice president of the Royal Historical Society, a fellow of the Royal Geographical Society, and a Member of the Royal Asiatic Society. His later works are *Notebook of Mediæval History* (1917); *History of Russia*, with colleagues (1918); and *Nineteenth Century Europe* (1922).

**BECHTEREV, VLADIMIR** (1857-1927). A Russian neurologist and psychologist, born in the Wjatka Province of Russia, and educated at the Petersburg Medico-Chirurgical Akademie (M.D., 1878). He discovered "Bechterev's nucleus" (of the anterior auditory root) and his experiments in the conditional reflexes in dogs furnished an approach to the doctrine of human behaviorism. Before the World War, he was professor of neurology and psychiatry in the universities of Kasan and St. Petersburg. Afterward, he devoted himself largely to the Leningrad Brain Pantheon. Some of his most important books are *Les voies de conduction du cerveau et de la moelle* (1900); *Die Persönlichkeit* (1906); *Psyche und Leben* (1908); *Les fonctions nerveuses* (1910), and *Objective Psychologie oder Reflexologie* (1913). His most important work after the War was *Allgemeine Grundlagen der Reflexologie des Menschen* (1926).

**BECHUANALAND, be-chwā'nā-länd.** A British native protectorate in South Africa under control of the British Colonial Office, administered by a resident commissioner under the

direction of the high commissioner for South Africa. It has an area of 275,000 square miles and a population (census of 1921) of 152,983 of whom 1743 were Europeans. The most important city is Serowe; population, 20,000. The native peoples are a pastoral folk for the most part, and export cattle and skins to South African markets, notably Kimberley, Johannesburg, and Mafeking. The mines of the Tati District produced gold and silver valued at £16,020 in 1926-27. Administrative costs consistently increased, expenditures in 1913-14 being £66,740, and in 1926-27, £108,578. The revenue in the same year was £131,551. The protectorate belongs to the South African Customs Union and no figures for local trade are kept. There are 10 schools for Europeans and 81 for natives (1926-27).

**BECK, EMIL G.** (1866- ). An American surgeon, born in Bohemia, and educated in Prague and at the University of Illinois (M. D., 1896). About 1908 he reported favorable results from the use of a bismuth paste in the treatment of tuberculous sinuses and in 1910 published a monograph *Bismuth Paste in Chronic Suppurations*, which aroused much interest. The use of the paste made possible X-ray photographs of sinuses as bismuth is a contrast substance. Much debate arose as to the existence and nature of poisoning from absorption of the paste, which sometimes developed.

**BECK, JAMES MONTGOMERY** (1861- ). An American lawyer and author, born at Philadelphia and educated at Moravian College. He was admitted to the bar in 1884. He was United States Attorney for the Eastern District of Pennsylvania (1896-1900), assistant attorney general of the United States (1900-03), and member of the law firms of Shearman & Sterling, New York (1913-17), and of Beck, Crawford & Harris, New York (1917-21). In addition, he has held the position of trustee and bank director, and in 1921-25 was solicitor general of the United States. He was a member of the 70th Congress, representing the First District of Pennsylvania. He is the author of several works on international relations, with searching analyses of the problems of war and peace. *The Evidence in the Case* (1914) discusses the question of responsibility for the World War, with a condemnation of Germany. *The War and Humanity*, with a foreword by Theodore Roosevelt (1916), is a brief for world coöperation. *The Reckoning* (1918) is a discussion of the moral aspects of the peace problem, and *The Passing of the New Freedom* (1920) is a satire on President Wilson. He is also author of *The League of Nations* (1919); *The Constitution of the United States*, with a preface by the Earl of Balfour (1923), and *The Vanishing Rights of the States* (1926).

**BECKER, ALFRED LE ROY** (1878- ). An American lawyer, born in Buffalo, N. Y., and educated at Harvard and Buffalo universities. He practiced law in Buffalo, 1902-14, and later became deputy attorney of the State of New York (1915-19). He attained a nation-wide reputation during the years 1917 to 1919 for his investigation and exposure of German plots and propaganda. In 1919 he resumed practice in New York City. He is known as a lecturer on Dutch history in New York. He is the author of *Forged Checks and Drafts* (1927).

**BECKER, CARL LOTUS** (1873- ). An American historian, born in Blackhawk County,

Iowa, and educated at Wisconsin and Columbia universities. He taught history successively at Pennsylvania State and Dartmouth colleges and Kansas, Minnesota, and Cornell universities. He became professor of history at Cornell in 1917. In 1915 he was made a member of the board of editors of the *American Historical Review*. A student of Frederick J. Turner, he acquired much of his master's historical philosophy, technical skill, and literary style. His most successful works in this respect have been "Kansas" in the *Turner Essays* (1910), *Beginnings of the American People* (1915), and *The Eve of the Revolution* (1918). The latter is easily one of the best of the *Chronicles of America* series. His other works include *America's War Aims and Peace Terms* (1918); *The United States, an Experiment in Democracy* (1920); *The Declaration of Independence—A Study in the History of Political Ideas* (1922), and many monographs on the French Revolution, which is the theme of his principal seminar.

**BECKETT, PERCY GORDON** (1882- ). An American mining engineer, born in Quebec, Canada, and educated at Fettes College, Edinburgh, and at the School of Mines at Camborne, Cornwall. He served as superintendent and engineer of several important mining corporations. From 1908 to 1912, he was engineer for Phelps, Dodge & Co., in Arizona, and was also the general manager of the Old Dominion Company at Globe, Ariz., from 1912-17. He became general manager and vice president of the Phelps, Dodge Corporation in Arizona in 1920.

**BECKHAM, J. CREPPS WICKLIFFE** (1869- ). An American lawyer and ex-senator, born at Bardstown, Ky., and educated at the Central University of Kentucky. He was admitted to the Kentucky bar in 1893. In 1894 and 1896-98, he was a member of the Kentucky House of Representatives, and was Speaker in the latter year. From 1900 to 1907, he was the governor of Kentucky. He was a member of the United States Senate, 1915-21, and a delegate-at-large and member of the Committee on Resolutions of the Democratic National Convention in 1904, 1908, and 1912; he was delegate-at-large in 1916 and 1920.

**BEDFORD-JONES, HENRY JAMES O'BRIEN.** (John Wycliffe, pseud.) (1887- ). An author, born at Napanee, Ont., and educated at Trinity College (Toronto). He collaborated in *The Boys' Big-Game* series. *The Boy Scouts of the Air* series, and *The Captain Becky* series (1912). Besides contributions to magazines, he has written *Gathered Verse* (1916), *L'Arbe Croche Mission* (1917), *The Mesa Trail* (1920), *The Shadow* (1922), *Canada, 1695* (1922), *Son of Cincinnati* (1925), *Rodomont* (1925), *Black Bull* (1927), and *King's Passport* (1928).

**BÉDIER, CHARLES-MARIE-JOSEPH** (1864- ). An eminent French scholar who was born in Paris and, after teaching in the faculties of Fribourg and Caen, succeeded Gaston Paris at the Collège de France (1903) as professor of mediæval French language and literature. He was elected to the French Academy in 1920 and was a director of the *Revue de France*.

As a scholar, he united minute scientific accuracy with sure literary insight as was shown in the introduction to his edition of the *Lai de l'Ombre* (1890), *Les Fabliaux* (1893), and *Les Légendes Épiques*, 4 vols. (1908-13). In the *Lai de l'Ombre*, he opposed the mechanical German method of text constitution. The *Légendes*

*Épiques* was a monumental work in which he refuted the old theory of the origin of epic poems. His *Tristan et Iseult* (1900) was an adaptation of the ancient story, based on all the extant mediæval versions in every language, and his *Chanson de Roland* (1922), with a commentary and glossary (1927), was a diminutive edition of the oldest French masterpiece.

The collating of these numerous texts was done with painstaking care. During the World War, Bédier abandoned his scholarly work and published several arraignments of Germany, of which *L'Effort Français* is the best known. Besides numerous articles in periodicals, his work not mentioned above includes *Colin Muset*, a Latin thesis (1893); *Études Critiques* (1903); Thomas's *Roman de Tristan*, 2 vols. (1903-05); *Deux Poèmes de la Folie Tristan* (1907); *Chansons de Croisade* (1909), and *Histoire de la littérature française illustrée* (2 vols, 1923-24). He wrote part of the *Histoire de la nation française*, edited by Gabriel Hanotaux.

**BEEBE, (CHARLES) WILLIAM** (1877- ). An American ornithologist, explorer, and essayist (see VOL. III). He is the author of *A Monograph of the Pheasants*, an elaborate work in four volumes, the first of which appeared in 1918 and the second in 1921, *Galapagos: World's End* (1924), *Jungle Days* (1925), *The Arcturus Adventure* (1925), *Pheasant Jungles* (1927), and *Beneath Tropic Seas* (1928). He also wrote essays founded on his observations in the tropics. Most of these appeared in the *Atlantic Monthly*.

**BEECHAM, SIR THOMAS** (1879- ). A British orchestral conductor, born in Liverpool. While pursuing regular academic studies, he was instructed in music by private teachers. In 1899 he formed at Huyton an amateur orchestra which he conducted for three years and which gave him sufficient practical experience to accept, in 1902, a post as conductor with Truman's Opera Company. At the conclusion of the tour, he devoted an entire year to further serious study and then appeared, in 1905, as a full-fledged symphonic conductor with the Queen's Hall Orchestra. The following year, he founded the New Symphony Orchestra, which he conducted till 1908, when he formed the Beecham Symphony Orchestra. In 1910 he gave at Covent Garden a season of grand opera, conducting personally an extensive repertoire and arousing great enthusiasm by the excellence of the performances, to which his own splendidly drilled orchestra largely contributed. This success induced him to continue his career as impresario until 1920, when he suddenly retired from all musical activity. He emerged from this voluntary retirement just as suddenly in 1923, when he appeared as conductor of the Hallé Orchestra in Manchester. During the season 1915-16, he was also conductor of the London Philharmonic Society. He was knighted in 1916. Among the important novelties which he introduced to England are R. Strauss's *Feuersnot*, *Salome*, *Elektra*, *Rosenkavalier*, *Ariadne auf Naxos*, and *Josephslegende*; d'Albert's *Tiefland*; Rimsky-Korsakov's *Le Coq d'Or*; Delius's *Romeo and Juliette in the Village*; Leroux's *Le Chemineau*; Holbrook's *Dylan*; Lehmann's *Everyman*; Stanford's *The Critic*; Borodin's *Prince Igor*, Musorgsky's *Boris Godunov* and *Chovantchina*, etc. In all, he produced about 120 operas and ballets, of which one-half were either novelties or revivals. In 1928 he visited the United States, appearing with almost sensational success as

guest conductor of several of the foremost symphony orchestras.

**BEE DISEASES.** See ENTOMOLOGY, ECONOMIC.

**BEEF.** See LIVE STOCK.

**BEEHIVE COKE.** See COKE.

**BEER, EDWIN** (1876- ). An American surgeon, born in New York and educated at Columbia University. He was a prolific writer on surgery of the male urinary organs and in 1910 first described what was originally known as Beer's method of treating tumors of the bladder by the high frequency current applied through the natural passages. His great success with this method led to its general adoption by genito-urinary surgeons. In recent years, he did pioneer work in minor surgery upon child patients. He has also published many papers on abdominal surgery.

**BEER, GEORGE LOUIS** (1872-1920). An American historian (see VOL. III). He served with distinction on the American Commission to Negotiate Peace (1919), in control of Colonial affairs. On the formation of the League of Nations, he was made director of the mandatory section of the League's secretariat. His untimely death robbed the League of one of its most enlightened champions. Friends collected his important papers in 1923 under the title of *African Questions at the Peace Conference*. His studies of the British Colonial system in America were awarded the first Loubat Prize in 1913 as the best work published in the English language during the preceding five years on the history, geography, or archaeology of America.

**BEER, THOMAS** (1889- ). An American writer, born at Council Bluffs, Iowa, and educated at Yale and Columbia universities. He served in the World War (1917-18) and has contributed short stories to *The Century*, *Saturday Evening Post*, *Smart Set*, etc. In 1922 he published *The Fair Rewards*; in 1923, *Stephen Crane: A Study in American Letters*, in 1924, *Sandoval*, a novel, in 1926, *The Mauve Decade*, and in 1928, *Road to Heaven: a Romance of Morals*.

**BEER/BOHM, MAX** (1872- ). A British author and caricaturist (see VOL. III), who lived in Rapallo, Italy. His later works include *Savonarola: an 'Elizabethan' play* (1919); *Seven Men* (1919); *And Even Now* (1920); *More* (1922); *A Defence of Cosmetics* (1922); *A Peep Into the Past* (1923); *A Variety of Things* (1928), and *The Dreadful Dragon of Hay Hill* (1928). He also published books of his caricatures: *A Survey* (1921); *Rossetti and His Circle* (1922); *Things New and Old* (1923), and *Observations* (1925). Consult *Max Beer-bohm in Perspective*, with a bibliography, by Bohun Lynch (1921); *Peeeps at the Mighty*, by Patrick Braybrooke (1927), and *The Artists of the 1890's*, by John Rothenstein (1928).

**BEE TLE, JAPANESE.** See ENTOMOLOGY, ECONOMIC.

**BEHAN, RICHARD JOSEPH** (1879- ). An American surgeon, born at Pittsburgh, Pa., and educated in medicine at the university there. He is known for his extensive monograph *Pain* (1914), the most complete work ever written on the subject. In the second Balkan War he served as a surgeon at the Fourth Reserve Hospital in Serbia. He has been surgeon to various Pittsburgh hospitals and director of the cancer department of the Pittsburgh Skin and Cancer Foundation.



**BEHAVIORISM.** A school of psychological doctrine developed in recent years under the leadership of the American psychologist, Prof. John B. Watson. Its central idea is to regard psychology as a scientific study of behavior and to explain behavior as a system of responses to stimuli. The topic of behaviorism in 1924 occupied the forefront of psychological polemic and had divided Anglo-American psychologists into two camps, the behaviorists and the anti-behaviorists. In the United States, the psychologists styling themselves behaviorists were said to constitute a numerical majority, but as there exist among them infinite variations of doctrine, ranging from Watson's own statement in his *Psychology from the Standpoint of a Behaviorist* (1919) to the mere use of certain behavior concepts, this is not as significant as it may seem.

Behaviorism may be best understood as a somewhat impatient attempt to make psychology a science like other sciences regardless of the peculiar complexity of mental phenomena. It is a reaction against the slow methods of experimental introspection developed by Wundt and Titchener. It is therefore a revolt in the direction of empiricism and objectivity. The method of behaviorism was evolved from animal psychology. In 1906 there was published in Paris a book by Kostylef on the present crisis in psychology. In it the author portrayed what he regarded as the theoretical breakdown of experimental psychology, and showed that individual experimentation had outrun the capacity of the science for synthesis. The number of experimental papers accumulated in the United States alone defied any effort at integration.

As a remedy for this disorganization, Kostylef held up the conditioned reflex theory developed by the Russian physiologists, Pavlov and Bechterev—a theory which would transform psychology into an objective science. What was this conditioned reflex? When food is exposed to a dog, his mouth begins to salivate. This is called a reflex action. Now the same dog can be made to salivate when food is exposed and a gong rings at the same time. After the sound of the gong and the exposure of the food has been imposed upon the dog's attention at repeated intervals, the food can be withdrawn altogether, and the salivation reflex will be induced by the sound of the gong alone. This conditioned reflex will function only a short length of time—about a month, unless its association with the simple reflex is renewed.

In this conditioned reflex and in the formation of new habit responses, Kostylef saw the hope of developing a completely objective psychology which would explain even the most complex human activities. In retrospect, we may say that we had here the essentials of the behaviorist programme without the label of behaviorism. The behaviorist movement, however, did not crystallize until the work of Pavlov and Bechterev was translated and made available in English and German, and was combined with the already thriving animal psychology studied by Thorndike, Washburn, Jennings, and Watson. The behavior articles of Watson began to be published about 1913 and soon attracted a following to the new point of view, as well as bitter criticism from the camp of the introspectionists.

First and foremost, the behaviorist viewpoint is a challenge to the traditional preoccupation

of psychology with consciousness. Historically, modern psychology developed out of the empirical movement in philosophy—Locke's quest for the origin of ideas. The first fundamental theory of psychology was the association of ideas or sensations. As the technique of physiology was perfected, the associationist psychology was modified into a physiological psychology, with the hypothesis of psycho-physical parallelism as the theoretical bridge. Mental phenomena as introspectively reported were correlated with the physical or physiological stimuli, and thus the progress of the science was made to depend on two factors: the perfection and precision of laboratory apparatus and introspective training on the part of the observer. Introspection could never be made precise enough to compare with the mathematical delicacy of physical and physiological technique, and moreover, there was the additional difficulty of passing from conscious taste to conscious action.

On the other hand, biology approached the study of animals and man precisely through the notion of individual action for the protection of the organism, and it is from biology that the idea of instincts, or inherited modes of action, and reflexes, or acts automatically induced by stimuli, were developed and passed on to psychology. The difficulty here was just the reverse, how to pass from acts to consciousness. The concept of the struggle for existence, with its ambiguous connotation of mechanism and conscious reflection, has often been made to serve as a connecting link between activity and thought. Around this concept has grown the school of psychology known as functionalism—implying that psychic activity is a unified function of the individual in his biological struggle. The best representative of this psychology in America was William James, who incidentally derived his pragmatic philosophy largely out of the same motif. Where the structuralists sought microscopic precision through introspective analysis, the functionalists slurred over details for the benefit of a sweeping gesture.

In animal psychology, treated elsewhere under that title, none of the problems of introspective analysis is present for the simple and sufficient reason that we cannot ask animals to introspect. The method of procedure is necessarily objective, being confined to a study of external behavior in correlation with the stimulus or situation set by the experimenter for the animal. However, if the observation is objective, the interpretation of results or, for that matter, the setting of the experiment, betrays a reference to the introspective consciousness of the human individual.

No experimenter can regard the animal as a dumb mechanism in spite of the fact that the response to stimulus is in many cases almost automatic. And the very existence of the conditioned reflex leads to problems almost as puzzling as the association of ideas in man. But just as the early associationists took the association of ideas to be a mechanical affair, regulated by such conditions as contiguity, frequency, etc., so many of the animal psychologists look upon the conditioned reflex as if it were an automatic mechanism. The discovery of "insight" in the animal as a means of meeting problems (see *ANIMAL PSYCHOLOGY*) also promises to offer serious difficulty to the behaviorist.

Under ordinary conditions, the adoption of the technique of animal psychology to explore the complexities of the human mind would be re-



garded as an attempt to explain the obscure by the more obscure. But the ground had already been prepared for throwing out consciousness from human psychology. As one wit put it, after losing its soul, psychology was to lose its mind. In 1904 James led a polemic against the belief in the existence of consciousness as an entity. He was ready to grant a functional existence to it, but would have nothing to do with "the hypothesis of a trans-empirical reality." Those who still cling to consciousness, he said, "are clinging to a mere echo, the faint rumor left behind by the disappearing 'soul' upon the air of philosophy. . . . The healthy thing for philosophy is to leave off grubbing underground for what effects effectuation or makes action act."

Another influence which favored the rise of behaviorism was the pressure of American life in the direction of an empirical applied psychology, or a psychology of individual capacities. Here, too, biological functionalism was the implicit theoretical assumption, but the use of statistical methods prevented any grievous errors. In the case of behaviorism, the appeal presented is not that of the actuary, who predicts future cases by comparison with the tabulated instances of the past: it is rather the appeal of system. Human activity is explained in a quasi-mechanical manner as the play of instincts, reflexes, habits. Sensation and perception are abolished, and thought is reduced to the status of an implicit language habit. Red, yellow, blue are no longer regarded as visual sensations or after images, but are responses to the respective physical stimuli.

This oversimplification has been criticized by many psychologists who wish to remain behaviorists. Thus, Prof. John Dewey wants to find room for value and purpose concepts, and the neo-realists who first welcomed the new psychology because it eliminated that "alien influx into nature," consciousness, have found much difficulty in explaining purpose behavioristically. It must be admitted, however, that other systems of psychology, including structuralism, have shared this difficulty of explaining moral ideas.

The legitimacy of the behavioristic scheme has been attacked on strictly scientific grounds by Boring in his paper, *Stimulus Error*. "In introspective psychology," he writes, "it has been customary to distinguish between attention to the stimulus and attention to the sensation or the subjective reaction produced by the stimulus." The behaviorists, in common with the capacity psychologists, refuse to recognize the stimulus error (judgment about the stimulus instead of the sensation) and correlate all responses in the same column. Now it is possible, he holds, to demonstrate experimentally the existence of an equivocal correlation if the subjective dispositions are neglected. A more popular illustration of the same argument can be cited in the difficulty of explaining hallucination in behavioristic terms.

Outside of psychology, behaviorism has received support from pragmatism because of the similarity of emphasis on action, and from neo-realism for its realistic empiricism. The rationalists and idealists, however, regard behaviorism as a simple variety of materialism. Their opinion is best represented by Lovejoy who raises the "Paradox of the Thinking Behaviorist." See INSTINCT; ACTION; CONSCIOUSNESS

AND THE UNCONSCIOUS; PSYCHOLOGY, GENERAL.

Consult: J. B. Watson, "Psychology as the Behaviorist Sees It," *Psych. Rev.* vol. XX (1913); *Behavior* (1914); *Psychology from the Standpoint of a Behaviorist* (1919). Roback's *Behaviorism and Psychology* (1922) is a polemic against Behaviorism, and may be used as a guide to the discussions in the psychological periodicals. A textbook of psychology that is in sympathy with the behavioristic point of view is, J. F. Dashiell, *Fundamentals of Objective Psychology*, (1928).

**BEHRENS, bā'rēns, PETER** (1868- ). A German architect, born in Hamburg. He was honorary member of the Academy of Fine Arts in Vienna and the Prussian Academy of Arts, and in 1924 became president of the Academy of Fine Arts in Munich. He was lecturer at the Arts and Crafts School in Vienna and the technical high school in Dresden, Royal Bavarian building inspector and professor of architecture. Among the buildings designed by him were the German Embassy at Leningrad, the St. Benno Column in Munich, a mausoleum in Regensburg, and the German Art Building at the exposition in Rome (1911).

**BEITH, bīth, JOHN HAY** (1876- ). An English writer, under the pen-name of Ian Hay, He was educated at St. John's College, Cambridge. His books, written in a humorous vein, became widely popular. They include *The Right Stuff* (1908); *A Man's Man* (1909); *A Safety Match* (1911); *Happy-Go-Lucky* (1913). He served during the World War in the Argyll and Sutherland Highlanders, rising to the rank of major. His book, *The First Hundred Thousand* (1915), was one of the most widely read volumes relating to the War. His later books include *The Willing Horse* (1921), *The Lucky Number* (1923), *Paid, with Thanks* (1925), *Half-a-Sovereign* (1926), and *The Poor Gentleman* (1928). *A Damsel in Distress*, a play written with P. G. Wodehouse, appeared in 1928.

**BEKKER, LEANDER J. DE** (1872- ). An American editor, born in Kentucky. From 1897 to 1919 he was identified with such various publications as *Carter's Magazine*, the *New York Evening Post*, and the *New York Tribune*. As the editorial correspondent of the *Tribune* (1919), he led the opposition to Mexican intervention. He was confidential assistant of the United States War Trade Board and in 1914 was one of the founders and the first president of La Ligue des Pays Neutres. In 1927 he organized an effort to restore the independence of Haiti and published *Occupied Haiti*. He became secretary of the Writers' Publishing Company in 1915 and president in 1921. His works include *The Stokes Encyclopædia of Music and Musicians* (1908, 1910, 1912), *The Plot against Mexico* (1919), *De Bekker's Music and Musicians* (1924), and *Wisdom and the Frail Lady* (1920). He edited *Hoyt's New Practical Cyclopædia* (22d ed.).

**BEKKER, PAUL** (1882- ). A noted German musicologist, born in Berlin. He began his career as a violinist in the Berlin Philharmonic Orchestra, then was conductor in Aschaffenburg and Görlitz, but in 1906 abandoned the artistic for a literary career, when he accepted the position as critic for the *Berliner Neueste Nachrichten*. This post he exchanged for a similar one with the *Berliner Allgemeine Zeitung*, in 1909, remaining there until 1911. From then until 1925, he lived in Frankfurt as critic of the

*Frankfurter Zeitung* exerting great influence as a champion of the modernistic composers. In 1925 he was appointed intendant of the theatre in Kassel. Since 1927 he has filled the same position in Wiesbaden. Of his numerous publications, the more important are *Beeethoven* (1911; many editions; English transl., 1926), *Das deutsche Musikleben: Versuch einer soziologischen Musikbetrachtung* (1916), *Die Symphonien Gustav Mahlers* (1921), *Richard Wagner: Das Leben im Werke* (1924), *Von den Naturreichen des Kluges: Versuch einer Phänomenologie der Musik* (1924), *Materiale Grundlagen der Musik* (1926), *Musikgeschichte als Geschichte der musikalischen Formwandlungen* (1926), *Organische und mechanische Musik* (1927).

**BELASCO, DAVID** (1859- ). An American playwright and manager (see Vol. III). As firm a believer in old conventions now as ever, Belasco has lengthened his career with such popular successes as *Polly with a Past* (1917), *Tiger Rose* (1917), *Daddies* (1918), *Tiger! Tiger!* (1918), *The Gold Diggers* (1919), *Deburau* (1920) and *Kiki* (1922). An extravagantly costly revival of *The Merchant of Venice* (1923) roused a stormy critical discussion. Mrs. Fiske came under his direction in *Mary, Mary, Quite Contrary* (1923). He presented E. H. Sothern in *Accused* (1925) and in *What Never Dies* (1926); and Lenore Ulric as "Lulu Belle" (1926).

**BELFAST.** The capital of Northern Ireland. The population of Belfast County Borough in 1926 was 415,007. The city is admirably situated on either bank of the River Lagan at the head of Belfast Lough. Being of modern growth, it has reaped the advantage of a broad outlook on town planning denied to places which have grown piecemeal throughout the centuries. Local administration is vested in a corporation which is responsible for roads, public health, rating, housing, lighting, etc. The new Parliament Building of the Government of Northern Ireland has been constructed at Stormont in the eastern suburbs of Belfast. It is built of Portland stone with a plinth of Irish granite and commands a glorious vista of the counties of Antrim and Down. Approach is by a broad avenue which rises gradually for three quarters of a mile and culminates in a flight of steps 90 feet wide. A new museum, the foundation stone of which was laid by the Duke of York in July, 1924, is under construction, the first section having been completed in 1928 at a cost of approximately £100,000. Since 1923 several public elementary schools have been erected in Belfast, the old Town Hall in Victoria Street being reconditioned as the headquarters of the Education Department. Important waterworks construction includes a new storage reservoir which has been built in "Silent Valley" in the Mourne Mountains, so as to supply additional water to Belfast. Locks and weirs have been built across the tidal waters of the River Lagan above the mouth of the River Blackstaff, with spacious boulevards along their banks, the cost of the entire project being estimated at approximately £340,000. Linen manufacture and shipbuilding are the principal industries of Belfast. The former provides employment for approximately 110,000 persons. The value of linens exported from the United Kingdom during 1927 was £9,800,798, practically the whole of which came from Northern Ireland. The Belfast shipyards employ approximately 20,000 persons and

possess an output capacity exceeding 250,000 tons a year. The total area of the harbor amounts to approximately 690 acres of land and 1600 acres of water and the total quaysage to about 27,000 lineal feet. Amongst the natural advantages which Belfast has over most other ports is the smallness of its tidal range which at its maximum is only 9½ feet. This has rendered dock gates unnecessary, and consequently vessels can proceed direct to and from their berths at all times, thus obviating the tedious delays which arise at ports where vessels have to wait for high water in order to dock. The quays which afford berths for vessels drawing up to 30 feet at low water have a total extent of nearly 6 miles.

**BELGIAN CONGO.** See CONGO, BELGIAN; COPPER.

**BELGIUM.** A kingdom of western Europe, bordering on the North Sea, between France and the Netherlands. Belgium has an area of 11,755 square miles, with a population of 7,931,844 on Dec. 31, 1927, giving an average density of 675 persons to the square mile; the greatest of any whole nation, though portions of other countries may be more thickly populated. In spite of war losses, the population of Belgium (exclusive of the small territories annexed by the Treaty of Versailles) decreased by only 22,431 between 1910 and 1920, and was after that increasing at the rate of about 60,000 per year. The country is highly industrialized with 1,600,000 engaged in industrial pursuits and an agricultural population of 1,200,000 of whom 800,000 are actually engaged in agricultural work. The principal city and capital, Brussels, on Dec. 31, 1927, had a population of 783,123. The chief port, Antwerp, had 421,088 people, while Liège and Ghent possessed a population of 168,823 and 163,207, respectively. Between 1910 and 1920, the last two years for which complete census figures are available, the number of persons speaking only French increased from 2,833,334 to 2,855,835; the number speaking only Flemish fell from 3,220,662 to 3,187,073, and those speaking only German, from 31,415 to 16,877. Before the War, immigrants entering Belgium each year slightly exceeded emigrants from the country, but afterward the situation was reversed, and in 1921 immigrants numbered 24,389, compared with 27,443 emigrants. With the economic recovery of Belgium, the excess of emigrants was gradually diminishing, and the former situation seemed likely to return in a few years. The movement of population was greatest between Belgium and France, followed by the Netherlands and the United States. Emigrants in 1925 numbered 35,271; in 1926, 36,150; immigrants in the same years were 46,920 and 44,525.

**Education.** The educational system is becoming constantly more highly organized. In 1927 for primary instruction there were 8343 schools, with 800,400 pupils; 3666 infant schools with 245,650 pupils and 2104 adult schools with 61,266 pupils. For higher education, there were 24 atheneums and colleges, with 8280 pupils; 5 special atheneums with 388 pupils; 4 communal and provincial colleges with 2027 students, and 9 private colleges with 1481 students. There were 131 state higher grade schools with 28,944 students, 17 communal and provincial schools with 5021 students, and 7 private higher grade schools with 764 students. There were 6 normal schools for training secondary school

teachers and 81 for training elementary school-teachers. Above these schools are the 4 universities (Ghent, Liège, Brussels, and Louvain), several technical and commercial institutions, 3 military schools, a school of veterinary education, a colonial school, and an agricultural institute. The number of pupils in the universities rose from 8532 in 1913-14 to 9136 in 1926-27. No illiteracy statistics have been compiled since 1920 when the proportion was 17.9 per cent.

**Industry.** Despite the predominantly industrial character of the country, Belgian agricultural production is of considerable importance. The acreage of various crops returned practically to normal in the post-war years, but the emphasis was now more on sugar and forage beets, and other forage crops, than before the War. The accompanying table gives a comparison of the principal kinds of agricultural products in 1913 and 1927:

PRINCIPAL CROPS. AREA, PRODUCTION, AND YIELD PER ACRE

Crops	Area (thousands of acres)		Production (thousands of units—bushels, except as indicated)	
	1909-13	1927	1909-13	1927
Wheat	404	389	15,199	14,449
Rye	673	573	23,644	20,078
Barley	88	78	4,446	3,637
Oats	668	657	43,964	43,991
Potatoes	404	416	110,830	111,359
Sugar beets	146	175	1,627 *	1,983 *
Fodder beets	182 †	191	3,459 * †	4,732 *
Flax	} 49 †	52	51,888 † ‡	65,037 †
Linseed			472 †	415
Tobacco	10	8	20,767 †	13,492 †

\* Unit, metric ton. † 1911 to 1913 average. ‡ Unit, pound.

Mineral production is an important item in Belgium. The country has as natural resources supplies of coal and zinc, and after the economic union with Luxemburg in 1922 gained ready access to supplies of iron ore. Immediately after the War, resumption of metallurgical activity was initiated and by 1923 production had practically reached the pre-war level, except zinc production, which advanced more slowly.

Belgian glass production, an extremely important industry in the country, made rapid strides in the post-war years, approaching pre-war volume in window glass and surpassing it in other lines. Bottle and glassware making increased greatly in importance since the War, new factories for the former being opened at Lommel, Moll, Selzaete, and Jumet. The textile industry of Belgium is of paramount importance and is operating on practically the same scale as before the War. The number of cotton spindles in the country was 1,976,000 on Feb. 1, 1927, compared with 1,518,134 on Mar. 1, 1914.

The unemployment situation in Belgium has practically ceased to be a problem. On Dec. 31, 1921, there were 86,093 unemployed; at the beginning of 1928, there was no unemployment.

The accompanying table gives the leading facts concerning the industrial production of Belgium in 1913 and 1927:

INDUSTRIAL PRODUCTION

Product	1000 met. tons	1913	1927
Coal		22,842	27,574
Coke	"	3,523	5,386
Briquets	"	2,607	1,687
Pig iron	"	2,485	3,756
Crude steel	"	2,467	3,708
Finished steel	"	1,859	3,062
Crude zinc	"	204	203
Window glass	1000 sq. yds.	49,883	62,000
Plate glass	"	3,289	3,758
Cotton yarn	1000 lbs	112,000	143,000
Wool, conditioned	"	60,771	89,893
Rayon	"	6,283	14,300
Paper	met. tons	160,000	163,753

The value of the principal minerals and metals produced in Belgium in 1926 was as follows: Coal, \$109,128,000; pig iron, \$48,083,000; zinc, \$30,469,000; lead, \$13,842,000; and quarry products, \$17,367,000.

**Commerce.** Foreign trade prospered during 1927 and the trade balance improved steadily. Whereas, in 1913 Belgian exports equaled only 78 per cent of the value of imports, the ratio was 92 per cent in 1927 and 91 per cent in 1926. Total 1927 imports, reckoned in dollars to escape the distortion of exchange fluctuations, increased by 7.9 per cent over 1926 and exports, by 14 per cent. Features of the trade statistics were the much higher imports of raw materials and foodstuffs and the even greater advance in exports of manufactured products. Import items showing the principal advances in quantity were grains, oil cake, hides and skins, cotton, textile manufactures other than wool and silk fabrics, and metals. Exports of rubber goods, iron and steel products, and machinery increased considerably.

FOREIGN TRADE IN MERCHANDISE

Yearly average or year *	Thousands of dollars		Thousands of metric tons	
	Imports for consumption	Domestic exports	Imports for consumption	Domestic exports
1901-1905	504,675	399,915	16,685	15,164
1906-1910	691,345	543,189	23,097	17,405
1911-1913	875,597	712,301	31,056	20,530
1919-1920	811,663	473,046	9,058	8,761
1921-1925	768,741	575,274	26,638	18,534
1910	784,582	642,940	26,700	19,103
1911	832,406	682,418	29,230	19,838
1912	899,521	753,009	31,283	20,867
1913	894,865	701,475	32,656	20,885
1919	668,673	292,806	4,769	6,908
1920	954,653	653,285	13,347	10,613
1921	759,160	540,951	17,665	17,257
1922	724,571	486,688	22,558	17,000
1923	688,499	505,858	26,603	16,974
1924	821,314	640,947	33,412	20,365
1925	850,161	701,926	32,951	21,072
1926	748,053	648,006	34,380	23,187
1927	807,312	738,913	38,026	24,134

\* German occupation during years 1914-1918.

TRADE WITH PRINCIPAL COUNTRIES  
[Thousands of dollars]

Country	Imports for consumption		Domestic exports	
	1913	1927	1913	1927
Total	894,865	807,312	701,475	738,913
United States *	80,284	89,563	20,532	67,147
Canada	5,677	.....	3,565	.....
Argentina	61,142	65,295	17,593	21,531
Brazil	10,340	.....	13,524	.....
Chile	17,641	.....	3,095	.....
France	121,013	164,827	132,260	85,351
Germany †	145,893	100,042	181,443	123,185
Great Britain ‡	99,276	94,549	98,597	135,844
Italy	8,468	11,079	14,654	15,410
Netherlands	68,225	86,236	61,886	79,831
Russia	51,533	.....	17,057	.....
Finland	.....	.....	.....	.....
Spain	11,356	.....	8,779	.....
Sweden	6,672	.....	3,640	.....
Switzerland	3,740	6,556	10,265	16,016
British India	46,428	.....	9,295	.....
China	4,432	.....	10,037	.....
Japan	3,953	.....	4,647	.....
Australia	38,024	.....	4,694	.....
Belgian Congo	8,577	12,802	5,127	14,250
Egypt	1,188	.....	5,880	.....
Per cent of total:				
United States	9.0	11.1	2.9	9.1
France	13.5	20.4	18.9	11.6
Germany	16.3	12.4	25.9	16.9
Great Britain	11.1	11.7	14.1	18.4
Netherlands	7.7	10.7	8.8	10.8

\* Exclusive of Porto Rico and Hawaii.

† Includes Luxembourg in 1913.

‡ Exclusive of Ireland.

**Finance.** For the year 1913, budget estimates gave receipts as 758,452,349 francs and expenditures as 884,820,630 francs, leaving a deficit of 126,377,281 francs. After a period of severe inflation of currency, in the course of which the annual budget suffered huge deficits, Belgian currency and public finance returned to normal in October, 1926, when the franc was stabilized at 36 francs to one dollar. From that time on, the Government was able not only to balance its budget but to show a substantial profit. The budget for 1928 showed receipts of 10,564,000,000 francs and expenditures of 9,283,000,000 francs; the proposed budget for 1929 carried receipts of 11,485,090,000 francs and expenditures of 10,255,206,000 francs. On Jan. 1, 1928, the Belgian public debt amounted to 55,000,000,000 francs.

**Communications.** Belgium is a small, well-unified country, and communication facilities are excellent; the country has access to the sea, with a port of paramount importance in Antwerp; and it has also internal water connection by river and canal, as well as water and rail connection with the rest of western Europe. Practically all of the railways in Belgium are operated by the state; in 1913, the length of the state railways was 2714 miles, while in 1927, with the lines constructed during the War and those in the new districts of Eupen and Malmédy, it had increased to 2979 miles. The privately operated lines had in 1913 a length of 191 miles and in 1927, 189 miles.

Most of the railways, as noted above, were owned and operated by the central Government prior to September, 1926, at which time the state gave over the railways it controlled to the Société Nationale Chemins de Fer Belges, a semi-private company, in order to raise money to stabilize the franc. During 1927, the first complete calendar year of operation under the new organization, the total receipts in terms of francs (2,885,890,000) increased by more than 30 per cent and in terms of dollars (\$80,228,000)

over 12 per cent. Operating costs were equivalent to 82 per cent of receipts. The volume of traffic (217,242,000 passengers and 76,967 metric tons of freight) was, however, considerably less than in 1926. The number of ocean-going vessels of 100 tons capacity or over on June 30 was 172 or 304,386 gross tons in 1913; 270 of 616,070 tons in 1923; and 224 of 499,229 gross tons in 1927. Of the 1927 tonnage, 494,839 were steam or other power vessels and 4390 were sailing vessels. The number of vessels entered at Belgian ports in 1927 was 18,684, with a tonnage of 27,826,000 tons, compared with 11,964 vessels and 17,097,515 tons in 1913. About two-thirds of the tonnage entered at Antwerp before the War and the proportion increased somewhat after the War. The two other leading ports are Ghent and Ostend, which together receive about 20 per cent of the total tonnage. These statistics bring out particularly the increasing importance of shipping in Belgium, also the preëminence of the port of Antwerp in Belgian shipping and its continued importance in European trade.

**History.** Belgium's history was overshadowed by the War. On July 31, 1914, amid the alarms of a threatened world conflict, the Belgian government ordered a general mobilization. Two days later it was in receipt of an ultimatum from Germany demanding the right of passage across Belgian territories. The refusal to comply brought down on the Belgian people all the horrors of a war-ridden country. During August 3 and 4, German troops entered and, despite the heroic defense of the army, swept on unchecked. The lines yielded in rapid succession. Louvain was taken, August 10; Brussels, August 20; the French frontier was crossed on the 24th. The career of brutality embarked upon by the German invaders in an endeavor to break the spirit of the Belgian people will long remain a symbol of the meaning and purpose of modern warfare. The pillaging and burning of homes and the deportations and indiscriminate killing of civilians were coolly ordered and carried out by a staff and soldiery to whom war meant ruthlessness. Belgian official records reveal more than 1000 deaths in the province of Liège alone during August. The toll was almost as heavy in the Namur, Limburg, and Luxembourg provinces. The destruction of Louvain was indeed an act of cold-blooded ferocity. The city was entered on August 19 and was fired three days later after all effective opposition had ceased. The cathedral, the university and library, and more than 1000 homes were destroyed. In the city and its environs, 300 men were shot, and from it 1000 inhabitants were deported to forced labor in Germany.

In Flanders the career of the Germans was the same. With the fall of Brussels, the Belgian government fled to Antwerp, then to Ostend, then to Havre. Under the German military governors, von der Goltz, von Bissing, and von Falkenhausen, Belgium was progressively organized as a conquered province, control being made finally complete in July, 1918, when the provincial councils were suppressed. Yet the spirit of the people could not be crushed. The world now and then caught echoes of the heroic deeds of a M. Max or a Cardinal Mercier. *La Libre Belgique*, printed secretly, appeared regularly from 1915 to the end of the War. German influence and control permeated every channel of Belgian life. German military and civil tribunals gradually replaced Belgian courts until in

1918 the latter were abolished entirely. Under the German edicts, punishment was imposed on those who were believed cognizant of a forbidden act and who did not denounce it, and the presence of spies, etc., had to be reported on pain of long-term imprisonment. Belgian magistrates were often forcibly deported to Germany, the most flagrant example occurring in 1918 when the justices of the Brussels Court of Appeals were interned in a German civilian camp.

Belgium was struck at in other ways, notably in the attempt to separate Flanders from Walonia, first by encouraging in every way the use of Flemish in the northern provinces and then, in 1917, by erecting two different administrations, one to be governed from Brussels and the other from Namur. The University of Ghent was chosen as a pivotal point for these separatist activities. All other universities were closed, lectures were given only in Flemish, non-sympathetic professors were dismissed. But this and all other plans to divide the country culturally failed. Possibly affecting the life of the people more closely was the Germanization of all branches of the economic order for the furtherance of the Germany military effort. Beginning in 1914, German central bureaus monopolized coal, water, gas, electricity, oils, and fats. All needed war materials were requisitioned and paid for in vouchers, including even household articles containing copper, lead, zinc, etc. When industry languished because of the draining away of raw materials and machinery and the cessation of trade, the status of the civil population became alarming. In 1917 idle workers numbered 700,000. The Germans used this condition as an excuse for one of their most harrowing war measures, that of deporting great numbers of the people for forced labor in Germany or behind the lines in the war area. In 1916-18 more than 50,000 Belgians were sent to Germany and another 50,000 to the war areas. Some Belgians no doubt went willingly enough to escape starvation, but coercion was the rule. Not until the American, Dutch, and Spanish diplomats protested did the German Emperor promise to send back all who had been coerced. But the pledge was never carried out, and deportations continued until the end of the War.

The story of Belgium during the War cannot be complete without the tale of the Commission for Relief in Belgium. This organization, brought into existence late in 1914 by the American and Spanish ambassadors and ministers at London and Brussels, and the American ambassador and minister at Berlin and at the Hague, and managed until America's entry by Herbert C. Hoover, became the international clearing house and liaison division for the Belgian *Comité National de Secours et d'Alimentation* in the work of feeding Belgium. Importations and payments were handled by the Commission; distributions by the *Comité National*. To facilitate the work, the United States opened a monthly credit of \$15,000,000 for the Commission. An idea of the scope of the project may be gained from the fact that the provisioning department of the Commission for Relief undertook to feed from 7,000,000 to 10,000,000 people in the devastated areas of Belgium and northern France.

During the year ending Oct. 31, 1916, there were imported 1,706,774 metric tons of food into Belgium and 483,346 tons into France. Nearly one-half of these supplies came from the United

States and the remainder came about equally from Argentina and the British Empire, though small quantities came from Holland. Food was distributed through 3000 communal communities in Belgium and 2000 in France, staffed by about 35,000 volunteer workers. The benevolent department of the Commission cared for those who were wholly or partially destitute, including more than 1,500,000 children. It maintained special committees for children, farmers, refugees, the tubercular, destitute, and others. Up to the close of 1917, the Commission had expended nearly \$400,000,000, and during the fiscal year ending Oct. 31, 1918, it spent for relief in Belgium over \$83,000,000 received from loans to Belgium by the United States, and \$7,275,000 from loans by Great Britain and France. To complete the account, it should be stated that the Commission also expended in 1918, in northern France \$56,000,000 received from the United States loan to France, and an additional \$2,376,500 received from French sources. When the Commission wound up its affairs on Apr. 30, 1919, it was stated that something like \$1,000,000,000 had been spent in the relief of war victims during 1914-19. Until the entrance of the United States into the War, the entire personnel of the Commission was American; after 1917, direction was taken over by Spanish and Dutch citizens, although Mr. Hoover remained throughout as chairman. The director in America was Mr. W. L. Honnold, its treasurer, Mr. A. J. Hemphill, while Mr. Poland was the European director.

Nothing presented so disheartening an aspect as the condition of Belgium on the resumption of peace; and nothing showed so clearly the enduring qualities of the human spirit as the rapidity with which Belgium was resurrected. Not only had industry been destroyed but the usual channels of communication had been completely dislocated. In fact, the damage to property was put at \$7,600,000,000. Yet, by the end of 1922 it could be seen that the manufacturing industries were practically on a normal footing. Iron and steel plants were operating on a 75 per cent basis; linen, cotton, and artificial silk works exceeded their pre-war capacity, as did also the plate-glass and cement factories. The acreage under crops in 1922 was 97 per cent of the 1913 figure. In 1918 shipping was dead, the ports of Zeebrugge and Ostend badly damaged and their terminal facilities wrecked. The approach to Ghent by the sea canal from Holland was choked up because of the severe fighting which had taken place in that area. The losses from destruction of railway bridges, etc., in the four years of war were estimated at \$275,000,000. Rolling stock had been diverted for military purposes and had greatly depreciated; rails had been torn up by the enemy in retreat. Yet so rapidly had reconstruction been pushed that 58,221,686 metric tons of freight were carried on the railroads in 1922 as against 66,541,975 metric tons in 1913, and 238,096,000 passengers in 1922, as against 204,541,098 in 1913. At the time of the Armistice, there were 800,000 industrial workers unemployed and being supported by government doles; in September, 1919, the number thus supported had fallen to 200,000; by 1923 it was reported that marked shortages of labor were apparent in all specialized industries and so acute in the unskilled trades that laborers had to be imported from Poland and Italy.



The political parties met the awesome problems with courage. A coalition government representing the Catholics, Liberals, and Socialists administered affairs. In 1919 the elections, for the first time, were conducted on the principle of "one man, one vote" (women being given the vote only in municipal elections), and resulted in a great increase of the Socialist delegation, the Catholic Party losing its majority for the first time in 35 years. Legislative measures were progressive and showed a desire to conciliate all elements of the populace. In 1919 the repressive laws against freedom of association were, to a great extent, lifted and in the same year labor unions accordingly increased mightily; the eight-hour day in industry was installed; so were the income tax, a progressive inheritance tax, and a law limiting the sale of alcohol. Councils and commissions were erected for the amicable settlement of problems arising between capital and labor and their functions soon penetrated into almost every important industry. But the controversy over one question, the century-old Flemish movement involving particularly the question of the equal status of the Flemish and French languages, became increasingly sharper. In 1919 three Activists were elected to Parliament besides many others of Flemish sympathies in the Catholic Party, so that, for a time, the Government considered offering a Fleming a cabinet portfolio.

The line of division became sharper in 1921. As a result of continued agitation, the lower House passed a bill for the installation of both languages in the administration, to go into effect Jan. 1, 1922. The measure occasioned a storm of disapproval. Debate in the House was heated and for the first time in parliamentary annals, Walloons and Flemings voted against each other in solid blocs. It became increasingly perceptible that the Flemings could not be denied. Their attacks on the influence of the French became more bitter, their focal point in particular being the University of Ghent. Despite the pleas that the French language was necessary to bridge the gap of the patois used by both branches of the population and that the University was therefore necessary as the seat of a common culture, the Lower House in 1922 voted for the use of the Flemish language at Ghent.

In June, 1923, the Flemish question almost occasioned the fall of the Theunis government. This question and the new economic and social problems which the War had brought in, had a curious effect on political groupings. The traditional three parties were in a process of disintegration which showed itself in alliances cutting athwart party lines. Thus, the Catholic Right, under the control of the Flemings, was split up into Christian Democrats, Agrarians, Moderates, and Conservatives; the Socialists belonged to National and International groups, the latter Fleming in sympathy; the Liberals were either Conservative or Socialist in their leanings. Government, therefore, was falling more and more into the bloc system. On the Flemish question, the Catholics, International Socialists, and some Liberals stood together, and as this policy was antipathetic to France, the group also opposed a French alliance and favored one with Holland. However, on the question of military service, the group did not hold together, so that another alliance was necessary to effect legislation. The same situation held in the question of the extension of the provincial and parliamentary

franchise to women. The Catholics, for reasons of political expediency and because of the innate conservatism of the women, favored the project. The Liberals and Socialists, though they were committed to the principle of political equality for women, strenuously opposed. The result, because of these mixed loyalties, was an impasse after the election of 1921 which had ended in the return of a majority for no party. Only with the greatest difficulty was Colonel Theunis able to form a cabinet of Catholics and Liberals.

In the domain of foreign policy, an attempt was made to strike a new and more independent note, with little success, however. Belgium's plea for revision of the Treaty of 1839 by which she had lost to Holland the Province of Limburg and had been compelled to share with the Dutch the control of the Scheldt, was not entertained by the Peace Conference, and subsequent negotiations with Holland were equally fruitless. (See HOLLAND and LIMBURG). Her territorial gains as a result of the War were very small. To her fell the districts of Eupen and Malmédy and the tract of Moresnet on the German frontier, in all containing 382 square miles and a population of 64,000, and important for tanning and textile works. Only a small number of the population having indicated their desire to remain under German sovereignty, these regions were formally annexed in September, 1920. (See EUPEN, MALMÉDY, and MORESNET). In Africa, Belgium obtained Ruanda and Urundi, districts in western ex-German East Africa, which have an area of 18,000 square miles and a population of 3,500,000, and are important agriculturally because of their uplands. (See CONGO, BELGIAN). In 1918, Belgium effected with France a defensive alliance, and a military convention was concluded in 1920. An economic convention designed to cement still further the interest of the two countries was rejected in the Belgian Chamber, in February, 1924, by a coalition of Socialist and Flemish Catholic deputies, whose opposition led Premier Georges Theunis to reorganize his cabinet, dropping out M. Jaspas and replacing him with M. Paul Hymans as Foreign Minister. In 1922, Belgium concluded a treaty with Luxemburg by which all customs barriers were abolished.

In 1924 several commercial treaties were signed, the most important being those with Canada, Austria, and Japan. As for Russia, though the Government in 1920 seemed favorably disposed toward a resumption of commercial relations, in 1922 it definitely sided with France at the Genoa Conference against any recognition, unless Russia conceded the rights of private property. The reasons for the Belgian hostility were plain: it was indicated that Belgians had controlled about 150 Russian industrial and mining enterprises, capitalized at \$700,000,000.

By the peace treaty, in addition to 8 per cent of the German indemnity, Belgium was assured reimbursement from Germany for the 5,000,000,000 francs borrowed from the Allies and expended in the War. In the controversies with Germany regarding reparation payments, Belgium, like France, was disposed to insist rigorously on execution of the Versailles Treaty and, with France Belgium joined in occupying the Ruhr, January, 1923. Subsequently, however, French and Belgian policies tended to diverge, until the report of the Dawes Commission in 1924 offered a new basis of agreement. See REPARATIONS.



Belgian influence was prominent not only in helping to shape the reports of the Dawes Committee, but also in having them accepted at the London Conference in July. In consideration of the expected advantages from the Dawes plan, Belgium, with France, withdrew from a part of the occupied zone on the Ruhr. Although the spring elections were scheduled for May, a cabinet crisis set them forward to April 5. Many controversial questions were involved, the leading one being woman suffrage. The results of the elections showed a vote of 819,000 for the Socialists, who gained 10 seats in the House; 751,000 for the Catholics, who lost 2 seats; and 305,000 for the Liberals, who lost 10 seats. The task of forming a government which could command a majority was one of great difficulty, and was achieved only after two months and a half of political jockeying. Finally, M. Pouillet, leader of the Catholic Flemish extremists, formed a democratic ministry with Socialist support, containing five Catholics, five Socialists, and two Liberals. Extension of the vote to women was defeated in the Senate by a vote of 71 to 56.

On August 18 Belgium concluded an agreement with the United States for refunding the war and post-war debts, amounting with interest to \$727,830,500. This debt was divided into two parts, that due to loans of \$171,000,000 made during the War, and that due to loans of \$205,000,000 made after the war. Interest on the war debt was remitted entirely and the principal also was to be cancelled if Germany carried out her Dawes-plan obligations. Payments on the post-war debt were made low for the first ten years, after which they would amount to some \$10,000,000 annually. Following the settlement, the Minister of Finance tried to arrange a \$150,000,000 loan from American and British bankers to help in stabilizing the franc, but could only do so by agreeing to reduce the budget by 150,000,000 francs. This, Parliament agreed to do, in December. But when the Government attempted to go forward with the negotiations, it could not reach an agreement with the foreign bankers on other points, and the stabilization plan, although not abandoned, was held in abeyance. Because of this and other factors the value of the franc entered in March on an alarming decline which by the middle of the year brought the country face to face with its most dangerous crisis since the War. The currency decline combined with other causes to bring about a rapid disintegration of the cabinet.

In January, 1925, the Minister of Defense and the Chief of Staff resigned over a question of a reduction in the military forces. In May, the Finance Minister, Albert Janssen, resigned and was soon followed by the Minister of Colonies and the Minister of the Interior. Premier Pouillet was unable to fill their places and the government resigned on May 11. When an attempt to enlist sufficient support for the Socialist leader, M. Brunet, was unsuccessful, the Catholic ex-Minister of Foreign Affairs Henri Jaspar finally succeeded, on May 22, in gathering together a Government of Public Safety. The number of ministries was reduced from twelve to nine and an outstanding financial figure in the business world, M. Francoqui, was placed in charge of fiscal matters, serving as a member of the cabinet without portfolio. Thereupon, both cabinet and Parliament threw themselves into

the task of saving the franc and bringing about stabilization. The programme of Premier Jaspar included immediate and widespread economies, levying of new taxes, establishment of a sinking fund with which to pay the floating debt and take up an excess of currency, renewal of foreign credits, and stabilization of the franc. Parliament did its part by promptly approving the budget, voting 1500 million francs in new taxes, and turning over (July 13 and 14) to the King for six months its power of legislating on certain specified subjects.

Under this semi-dictatorship, the Government forced a consolidation of the floating debt and formed a company to operate the national railways along private-ownership lines. As a result of these and other energetic measures, the franc was stabilized in October. A new currency unit, the "belga," was created, chiefly for accounting use in foreign exchange. It was valued at five francs and was rated at 35 belgas to the pound sterling. The franc was thus stabilized on the basis of about 36 francs to the dollar. For effecting this result, a foreign loan of \$100,000,000 was authorized and arranged. The result of stabilization was a quick return of confidence and a marked improvement in the financial situation. In the year or two following, the cost of living was materially lowered, business prospered, and government revenues showed gratifying surpluses. In the October elections, the support of the public was evidenced by a gain of three seats for the Catholic Party and losses by the other principal parties.

In January, 1926, the beloved Cardinal Mercier died. In the same month, Parliament ratified the Treaty of Locarno and later approved and made effective a number of other international agreements, including the terms of the debt settlement with the United States, the World Court agreement, and various trade treaties. A treaty controversy with China in 1926 was noteworthy because it was the first instance in which China sought to free herself from extra-territoriality agreements with other nations. The pact in question was the Treaty of 1865, revision of which was requested by China. Later, that country declared that the treaty was no longer in force from Oct. 27, 1926, and an arrangement was proposed making Belgians in China subject to Chinese jurisdiction. Belgium referred the matter to the World Court, but, in January, 1927, withdrew the request for a ruling and gave notice of an effort to negotiate a new treaty with China.

Following the critical events which resulted in the stabilization of the currency, Belgium enjoyed a long period of political quiet and economic recovery. Throughout most of 1927, the political parties refrained from pressing controversial matters in order not to interfere with the financial programme. There continued to be discussion of the proposed amnesty for exiled "Activists" who had helped Germany in her war-time attempt to separate Flanders from Belgium, but the sentiment of the country was strongly adverse. Germany renewed an offer to buy back Eupen and Malmédy, the two provinces assigned to Belgium by the Peace Conference, but nothing came of the move. More insistent was the question of reduction in the period of military service to six months from the ten-, twelve-, and thirteen-month terms prevailing. This was continually being brought up by the Socialists, and at length, on Nov. 21, 1927,

the Jaspard cabinet fell because of a clash over the subject. It was at once reorganized without the Socialist members, the most notable substitution being that of M. Paul Hymans for M. Vandervelde in the post of Foreign Minister. Both, however, were known as ardent supporters of the League of Nations. The new cabinet turned the question of length of military service over to a committee of parliamentary and military experts and, following their recommendation, Parliament passed a bill setting terms of service at 8 to 14 months according to the arm, and making other provisions relating to size of the annual contingent and languages to be used by officers.

In 1928 much bitter feeling was aroused over the question of a proposed inscription on the facade of a magnificent new library which Americans built and presented to the University of Louvain. Its American Architect, Whitney Warren, planned to inscribe upon it a Latin inscription meaning: "Destroyed by German Fury, Restored by an American Gift." The rector of the university objected strongly on the ground that it would promote international ill-feeling. Two factions presently developed in support of these contentions, and national feeling ran high. Preceding the dedication on July 4, it was announced that a telegram from Herbert Hoover favored leaving the decision in the hands of the rector of the university, which meant that the inscription would be left off, and the King supported that attitude. Mr. Warren refused to attend the dedication and threatened recourse to the courts. The controversy continued throughout the rest of the year. In June, 1928, the royal family visited the Congo. In December, many thousands were rendered homeless by floods along the River Scheldt. The gratification of Herbert Hoover to the Presidency of the United States was affectingly expressed by public exercises on Jan. 19, 1929, when Mr. Hoover, in Washington, conversed with King Albert by radio telephone.

**BELGIUM, COMMISSION FOR RELIEF IN.** See BELGIUM.

**BELL, BERNARD IDDINGS** (1886- ). An American educator and clergyman. He was born at Dayton, Ohio, graduated at the University of Chicago (1907), and studied theology at the Western Theological Seminary, Chicago (S. T. B., 1912). He was ordained in the Protestant Episcopal Church in 1910, was a vicar at St. Christopher's Church, Oak Park, Ill., 1910-13, dean of St. Paul's Cathedral Church, Fond du Lac, Wis., 1913-18, and aide to the senior chaplain of the Great Lakes Naval Training Station, 1917-19. Since 1919 he has been president and warden of St. Stephen's College, Annandale-on-the-Hudson (now incorporated in Columbia University, New York). He is the author of *Right and Wrong after the War* (1918); *Work of the Church for Men at War* (1919); *The Good News* (1921); *Postmodernism and Other Essays* (1925); *Common Sense in Education* (1928).

**BELL, CLIVE** (1881- ). An English art and literary critic, educated at Trinity College, Cambridge. In his critical essays, he has harshly repuked all artists who follow the doctrine of exact representation and lauded those wielding their talent for the expression of personal emotion. He is the author of *Art* (1914), *Peace at Once* (1915), *Pot Boilers* (1918), *Poems* (1921),

*Since Cézanne* (1922), *On British Freedom* (1923), *Landmarks in Nineteenth Century Painting* (1927), and *Civilization* (1928).

**BELL, GERTRUDE M. L.** (1868-1926). An English traveler and geographer, born at Washington, Durham, and educated at Queen's College, London, and Lady Margaret Hall, Oxford. Having made adventurous journeys through northern Arabia (1913-14), she was able during the World War to give valuable information concerning unknown routes and so to aid the British army in its advance into Palestine. She was attached to the Military Intelligence Department, Cairo (1915), and the Admiralty Intelligence Office in Cairo (1916-17). In 1916 she was liaison officer of the Arab bureau in Iraq. In 1917, she went with the British army to Bagdad and later acted as assistant political officer, exercising extraordinary influence over the Arab chiefs. She received the Founder's Medal of the Royal Geographical Society and a C.B.E. for her political services. Her publications include *Poems from the Divan of Hafiz* (1897); *The Desert and the Sown* (1907); *The Thousand and One Churches*, with Sir W. M. Ramsay (1909); *Palace and Mosque at Ukhaidir* (1914), and *Review of the Civil Administration of Mesopotamia*, issued by the Indian Office (1921). *The Letters of Gertrude Bell* were edited by her stepmother (1927), and *Persian Pictures*, first brought out in 1894, was republished in 1928 after her death.

**BELL, JAMES FRANKLIN** (1856-1919). An American soldier (see VOL. III). He commanded the second division of the United States Army in Texas, 1914-15; the Western Department at San Francisco to May, 1917, the Eastern Department to September, 1917, and later the 77th Division of the Army, at Camp Upton.

**BELL, JOHN JOY** (1871- ). A Scottish journalist and author (see VOL. III). His later works include *The Whalers* (1914); *Wee Macgregor Enlists* (1915); *Little Grey Ships* (1916); *Story of Kitty Carstairs* (1917); *All Ages* (1918); *Just Jimima* (1919); *Jimmy Johnny* (1920); *The Pie in the Oven*, one act (1922); *Thread o' Scarlet*, in one act, (1923); *Courtin' Christina*, in one act, (1924); *The Brave Bailie* (1925); and *Exit Mrs. McLeerie* (1927).

**BELL, LOUIS** (1864-1923). An American electrical engineer, born at Chester, N. H. He was graduated at Dartmouth in 1884 and won a fellowship at Johns Hopkins. During 1888-89 he was professor of applied electricity in Purdue University and during 1890-92 he was editor of *The Electrical World*. After 1893 he practiced in Boston as a consulting engineer. He was active for many years in the General Electric Company and organized its electric power transmission department; he designed the first poly-phase plant used in the United States, both for power and lighting, as well as for railway service. His original investigations included studies on spectroscopy, alternating current phenomena, wireless telephony, physiological optics, and the interpretation of albedo. In addition to many scientific papers and monographs, he was co-author, with Oscar T. Crosby, of *The Electric Railway* (1892), *Power Distribution for Electric Railroads* (1896), *Electric Power Transmission* (1897), *The Art of Illumination* (1902), and *The Telescope* (1922).

**BELL, WILLIAM BLAIR** (1871- ). A British surgeon and authority on cancer. Having taken his medical degree at King's College

Hospital, London, he began practice at Liverpool and was appointed to the staff of the Royal Infirmary in 1905. He specialized first in gynecology and obstetrics and in the study of the ductless glands. In 1921 he was made professor of obstetrics and gynecology in the University of Liverpool and was also gynecological and obstetrical surgeon to the Royal Infirmary. When the Liverpool Medical (Cancer) Research Organization was founded, he was made director. His leading publications are *Principles of Gynecology* (3d. ed., 1919); *Sex Complex* (1916, 2d. ed., 1920), and *The Pituitary* (1919). He is best known for his introduction of the lead treatment of inoperable cancer, one of the few real advances in this field in recent years.

**BELLINGER, PATRICK NELSON LYNCH** (1885- ). A naval airman born at Cheraw, S. C., and educated at the United States Naval Academy. During the seizure and occupation of Vera Cruz in 1914, he was in charge of the airplane section and made daring flights over enemy territory. In 1919 he commanded the *NC1* during the Transatlantic flight (May 3-June 16). Later, he had charge of the material division of naval aviation. During the War, he received the Order of the Tower and the Sword from the Portuguese government and the Navy Cross. He was raised to the rank of commander, U. S. N., on Nov. 16, 1924.

**BELLOC, be-lôk', HILAIRE** (1870- ). An English author, born in France (see Vol. III). As a devout Roman Catholic, he has sought in much of his historical writing to stress the point of view and interest of his church. Since 1913, Mr. Belloc has lengthened the list of his works with *A Continuation of Linguard's History to the Death of Edward VII* (1914), *The Last Days of the French Monarchy* (1910), *General Sketch of the European War, second phase (The Battle of the Marne)* (1910), *Europe and the Faith* (1920), *The House of Commons and the Monarchy* (1920), *The Jews* (1922), *The Mercy of Allah* (1922), *The Contrast* (1923), *Verses and Sonnets* (1924), *History of England*, 3 vols. (1925-28), *The Cruise of The Nona* (1925), *Miniatures of French History* (1925), *The Emerald of Catharine the Great* (1926), *A Companion to Mr. Wells's "Outline of History"* (which aims at proving the errors, from a Catholic point of view, in Mr. Wells's book, 1926), *The Catholic Church and History* (1920), *How the Reformation Happened* (1928), *Danton; a study* (1928), *James the Second* (1928), *But Soft—We Are Observed*, with 37 drawings by G. K. Chesterton (1928), *A Conversation with an Angel* (1928), *Books That Change The World, and Other Essays* (1928), *Belinda* (1928); and *Survivals and New Arrivals* (1929).

**BELLOWS, GEORGE WESLEY** (1882-1925). An American artist (see Vol. III). In his last years, he won a long list of awards for his unusual paintings. The chief awards included the bronze medal, Carnegie Institute (1914), gold medal, Panama-Pacific Exposition (1915), bronze medal, Art Institute of Chicago (1916), Isidor Medal, National Academy of Design (1910), Temple Medal, Pennsylvania Academy (1917), gold medal, Pennsylvania Academy (1921), bronze medal, Art Institute of Chicago (1921), and first prize at Carnegie Institute (1922). In 1918 and 1919 he was an instructor at the Art Students' League, New York, and also in 1919 at the Art Institute, Chicago.

**BELMONT, ALVA E. SMITH (MRS. O. H. P.)** An American feminist, born at Mobile, Ala., and educated in France. While actively and generously interested in movements for social betterment, such as hospitals, children's homes, the abolition of child labor, and the improvement of working conditions for women engaged in industry, she is known preëminently for her efforts in the cause of woman's rights. A well-known speaker and writer on woman suffrage, she was founder and later president of the Political Equality Association. She was an organizer of the Woman Voters' Convention in 1915, and a liberal donor to the Woman's Party.

**BELOIT' COLLEGE.** A college of liberal arts for men and women at Beloit, Wis., founded in 1846. The student enrollment increased from 395 in 1913-14 to 559 in 1927-28, the number of members in the faculty from 35 to 40, and the library from 50,000 to 78,000 bound volumes and an equal number of pamphlets. The endowment rose in the same period from \$1,268,966 to \$2,682,814, and the income in 1927-28 was \$325,198. New dormitories for freshmen were completed for occupancy in the autumn of 1927. Edward Dwight Eaton, D.D., LL.D., who had been president since 1886, was succeeded in 1917 by Melvin Amos Brannon, Ph.D., LL.D., but was acting president again in 1923, and was succeeded by Irving Mauer, D.D., LL.D., who was installed in 1924.

**BELOW, OTTO VON** (1857- ). A German soldier born at Danzig. In the World War, he took part as a general of infantry and army commander in the battles of the Masurian Lakes (February, 1915), the Macedonian campaigns of 1916, the Italian campaigns of 1917, and the battles on the Western front in 1918. In the last, he commanded the 17th Army. He retired in 1919.

**BELTRAMI, bêl-trâ'mê, LUCA** (1854- ). An Italian architect, born in Milan, where in 1885 he became professor at the polytechnic school. He is especially well known for his work on ancient buildings, having restored, among others, the Palazzo Marino in 1890, which is now the town hall of Milan; the church and cloister of Santa Maria della Grazie; and the castle of Sforza, 1890-95. He was made a Senator in 1911. Beltrami also published books on the architecture of various periods, using imitations of the contemporary letterings. These include: *Il Castello di Milano sotto il dominio degli Sforza 1450-1535* (1885; 2d ed., 1894, with additions to the history of the Visconti); *Guida storica del Castello di Milano 1368-1894* (1894); *Il Cimitero monumentale di Milano, Guida artistica illustrata* (1889); *La Certosa di Pavia* (1895; 2d ed., 1907; translated into German, 1905).

**BÉMONT, he-môn', CHARLES** (1848- ). A French historian and palaeographer (see Vol. III), a member of the Institut and the director of the École Pratique des Hautes-Études (Sorbonne), an institution for the encouragement of disinterested scholarship outside of the academic degrees. He was also editor of the *Revue Historique*. His later works include *Chronique latine sur le premier divorce de Henry VIII* (1917); *Le comte de l'Île d'Oléron* (1917); *La Guyenne pendant la domination anglaise, 1152-1453* (1920), and *Histoire de l'Europe de 395 à 1270*, a new and revised edition of his earlier work in collaboration with Gabriel Monod (1921).

**BEN-AMI, JACOB** (1890- ). A Jewish actor born at Minsk, Russia, who went to the United States and played rôles in Yiddish for the Yiddish Art Theatre, New York City. Later, he won recognition on the American stage in *The Race with the Shadow*, a special production of the Theatre Guild with Arnold Daly's company; as Samson in *Samson and Delilah*, in *The Failures* (1923); *Man and The Masses* (1924); and later in *Welded*.

**BENAVENTE Y MARTINEZ, JACINTO** (1866- ). A Spanish dramatist, who inaugurated a new genre: plays for children, and wrote for the first performance of the *Teatro de los Niños* (Children's Theatre) *El príncipe que todo lo aprendió en los libros*. Benavente won the Nobel Prize for literature in 1922 and in 1922-23 made a triumphal tour of Spanish America and the United States. In 1929 he was working on his translation of the complete works of Shakespeare. Among his most important works are *Gente conocida* (a satire of the leisure class); *Lo cursi* (a satire of social climbers); *La noche del sábado* (a powerful tragedy); *Los intereses creados* (a keen study of vested rights); *La malquerida* (an unusually penetrating study of a struggle against an illicit love); *La otra honra* (1924); *Alfilerazos* (1924); *La mariposa que voló sobre el mar* (1926); *El hijo de Polichinela* (1927); *Pepa doncel* (1928); and *El demonio fué antes ángel* (1928).

**BENCHLEY, ROBERT CHARLES** (1889- ). An American editor and humorist, born at Worcester, Mass., and educated at Harvard University. In the period 1912-14, he was with the Curtis Publishing Company and subsequently joined the editorial staff of the New York *Tribune* (1916-17). He was managing editor of *Vanity Fair* (1919-20), dramatic editor of *Life* (1920), and literary critic on the New York *World* (1920-21). Mr. Benchley's writings have the supreme virtue of genuine humor. He wrote: *Of All Things* (1921); *Love Conquers All* (1921); *Pluck and Luck* (1925); *The Early Worm* (1927); and *Twenty Thousand Leagues Under the Sea or David Copperfield* (1928).

**BENCKENDORFF, COUNT ALEXANDER** (1849-1917). A Russian diplomat, educated in France and Germany. He entered the diplomatic service in 1869, acting as attaché to the Russian embassies in Rome and Vienna. From 1897 to 1903, he was Minister to Denmark, and from the latter year until his death he was Ambassador to Great Britain. Largely responsible for the reconciliation between Russia and England, he negotiated the Anglo-Russian agreement of 1907 which paved the way for the Triple Entente.

**BENDA, JULIEN** (1867- ). A French critic and novelist, who, in a period dominated by literary Bergsonism, became the vigorous defender of intellectualism and classical aesthetics. His *Belphegor* (1918) was an attack on the artistic standards of the twentieth century and its cultivation of feminine sentimentalities. His novels, *Les Amourânes* (1922) and *La Croix des Roses* (1923), were as intellectual as his critical theory. Before the World War, he published two polemical works against the new philosophy of Bergson, *Le Bergsonisme* (1912), and *Sur le succès du Bergsonisme* (1914). The *Dialogue d'Eleuthère* was a charming philosophical discussion of the follies of the modern age, particularly in its subjection to women. He also wrote

*L'ordination, fiction* (1913); *Les sentiments de Critias*, essays (1917); *Lettres à Melisande* (1925); *Le trahison des clercs* (1927, tr. 1928); and *Mon premier testament*, a literary autobiography (1928).

**BENDA, WLADYSŁAW THEODOR** (1873- ). A Polish-American illustrator born in Poznan, Poland, and educated in Cracow, Vienna, San Francisco, and New York. In 1911 he became a naturalized citizen of the United States. He was best known for his illustrations for American magazines, his decorative painting, and his creation of a new type of mask known on the stage as "Benda masks." He was awarded a silver medal for his work at the Panama-Pacific International Exposition, in 1915.

**BENEDICT XV, GIACOMO DELLA CHIESA** (1854-1922). Pope, 1914-1922, and 260th successor of St. Peter, first bishop of Rome. He was born at Pigli, Italy, educated at the gymnasium of his native city, and graduated with a doctor's degree in jurisprudence at the university there. He was ordained as a priest in 1878 and later served as undersecretary to Cardinal Meriano Rampolea. He was created archbishop of Bologna in 1907 and elevated to the Cardinalate in May, 1914; in September of that year, just two months after the outbreak of the World War, he was elected pope. Benedict XV was an unassuming head of the Roman Catholic Church, a sincere patron of arts, and, as his handling of the diplomatic situation at the Vatican during the chaos of the War proved, a subtle statesman. Throughout the struggle, he made frequent efforts to bring about a peace settlement. Benedict XV modeled his policy on that of Leo XIII and Pius X. During his pontificate, friendly relations were restored between the Vatican and the French government, which once more exchanged ambassadors. Great Britain also had a representative in Rome for political reasons. On Jan. 21, 1922, he died of pneumonia after an illness of five days. His circulars were published in eight parts (1915-23), and in 1917 he published the new *Code de Iuris Canonici*. Consult *La Papauté et l'Chrétienté sous Bénédicte XV*, by Goyau (1922).

**BENEDIKT, MORITZ** (1836-1920). An Austrian physician distinguished in many fields, including neuro-pathology, psychology, psychiatry, anthropology, criminology, and forensic medicine. He received his degree in medicine from the University of Vienna in 1859. He studied the application of electricity to diagnosis and treatment and in 1869 was made professor of nerve pathology and electrotherapy at his alma mater. Among his numerous works were *Elektrotherapie* (1868, later combined with another under the title *Nervenpathologie und Elektrotherapie*); *Anatomische Studien an Verbrechergehirnen* (1879), which received an American translation; *Kraniometrie und Kephalometrie* (1888), later translated into French; *Die Seelenkunde des Menschen* (1895); and his autobiography, *Aus meinem Leben* (1906).

**BENELLI, SEM** (1877- ). An Italian playwright whose work was characterized by a freshness of poetic fancy well illustrated in *Ali* (1921) and *The Love Thief* and *La Santa Primavera* (1923). An early play, *La Befra*, was given in French in Paris (1910), and in English in New York as *The Jest*, with John and Lionel Barrymore (1919). His other plays include *La Maschera di Bruto* (1908); *Tignola* (1911); *La Gorgona* (1913); *Le... Nozze dei Centauri*

(1915); *L'Arzigogolo* (1922); *L'Amorosa* (1925); *Il Vasso di perle* (1926); and *Con le stelle* (1927). Several of these were in verse, and he also wrote the poems, *L'Etare* (1916), and the prose, *Parole di battaglia* (1918), about the World War. Italo Montemezzi composed the music to his *The Love of the Three Kings* (*L'Amore dei Tre Re*), one of the most moving and beautiful modern operas.

**BENES, Beneš, DR. EDUARD** (1884- ). A Czechoslovakian statesman of the Socialist Party, born at Kozlany, Bohemia, and educated at the University of Prague and the Sorbonne, Paris. During the World War, he went to Paris as editor of a propagandist newspaper, *La Nation Tchèque*, working with T. G. Masaryk, later president of the Czechoslovak Republic, for the setting up of an independent Czechoslovak State. He was general secretary of the Czechoslovak National Council in Paris 1915-18 and chief of the Czechoslovak delegation to the Peace Conference at Paris (1919-20). He became Foreign Minister of the new State in 1918, a position which he has continued to fill. He was also premier from September, 1921, to October, 1922. As chief Czechoslovak delegate to the League of Nations (1920- ), he was elected to the Council of the League in 1923, 1925, and 1926. He was a founder of the Little Entente, one of the drafters of the Geneva Protocol (1924), and signed the Locarno treaties of December, 1925, on behalf of his country. His many publications on political and sociological subjects include *Le Problème Autrichien et la Question Tchèque* (1908); *The History of the Labor Movement in Austria* (1913); *Le Socialisme Autrichien et la Guerre; Political Partisanship* (1914); *The War and Culture* (1915); *De truires l'Autriche-Hongrie* (1916); *Bohemian Case for Independence* (1917); *The Spirit of the Czechoslovak Revolution* (1923); *Five Years of Czechoslovak Foreign Policy* (1924); *Difficulties of Democracy* (1924); *Diplomatic Struggle for the Czechoslovak Independence* (1925); *Problems of Slavonic Policy* (1926); and *My War Memories* (1928).

**BENÉT, STEPHEN VINCENT** (1898- ). An American author, born at Bethlehem, Pa., and educated at Yale University. As a student at Yale, he published *Young Adventure* (1918) and won a poetry prize. These early poems showed a precocious facility which has since developed into whimsical and bizarre expressions, in which he is at his best. Other publications of his include *Heavens and Earth* (1920); *The Beginning of Wisdom* (1921); *Young People's Pride* (1922); *Jean Huguenot* (1923); *Tiger Joy* (1925); *Spanish Bayonet* (1926), and *John Brown's Body* (1928), which won the Pulitzer prize for the best book of verse published in the United States that year.

**BENÉT, WILLIAM ROSE** (1886- ). An American author and editor. He was born at Fort Hamilton, New York Harbor, and was educated at the Sheffield Scientific School of Yale. From 1907 on, he engaged in journalism and editorial work, first in California and later as a member of the editorial staff of *The Century* (1911-18) and the *Nation's Business* (1919-20). He was associate editor of the *Literary Review* of the New York *Evening Post* (1920-24) and has since been associate editor of *The Saturday Review of Literature*. He wrote poetry of merit characterized by an excellent sense of form and a real imaginative talent, besides a

finely drawn romance and many critical papers. Among his published works were the volumes of verse, *Merchants from Cathay* (1913); *The Falconer of God* (1914); *The Burglar of the Zodiac* (1918); *Moons of Grandeur* (1920); the novel, *First Person Singular* (1922); *The Flying King of Kurio*, a story for children (1926); *Wild Goslings* (1927); *Man Possessed*, poems (1927); essays in *Saturday Papers*, with H. S. Canby and A. Loveman (1921); and with his wife a translation of Claudel's *The East I Know* (1914). In 1923 he married Elinor Wylie, the poet.

**BENÉT, MRS. WILLIAM ROSE.** See WYLIE, ELINOR.

**BENJAMIN, MARCUS** (1857- ). An American editor, born at San Francisco, Calif., and educated at the Columbia University School of Mines. After following his profession of chemist for several years, he turned to editorial work and has served on the staffs of the *Cyclopædia of American Biography*, the *Standard Dictionary*, the *Universal Cyclopædia*, the *New International Encyclopædia* and the *New International Year Books*. He was editor-in-chief of *Appleton's New Practical Cyclopædia*, 6 vols. (1910). Since 1896 he has been the editor of the publications of the United States National Museum and has been a member of the annual United States Assay Commission. During the World War, Dr. Benjamin was an aid in the office of Naval Intelligence and received the decoration of the golden palms with the rank of Officier de l'Instruction Publique from France in 1920 and that of Officer of the Crown of Italy in 1928. He has written extensively in biography, especially of scientific men and churchmen, in history and social science, and, on its 50th anniversary, prepared a review, *The Cosmos Club and its Relation to Men of Letters* (1928).

**BENJAMIN, bân'zhâ'mân', RENÉ** (1885- ). A French writer and novelist who also painted. He leaped into prominence through the publication of his war novels, *Gaspard* (1915) and *Les Repatriés* (1918), the former being unanimously awarded the Prix Goncourt for 1915. M. Benjamin excelled in portraiture of Parisian working types and reproduced argot in the naturalistic manner of Zola. Unlike Zola, he had no sociological axe to grind, and his types were singularly rich and good humored. Of his other works, several were satires, such as *Les Justices de paix ou les vingt façons de juger à Paris* (1913); *Sous le ciel de France* (1910); *Le palais et ses gens de justice* (1919); *La farce de la Sorbonne* (1921); *Amadou, bolchéviste* (1921); and *Aliborons et démagogues*, political satire (1927). His plays include *Le Pacha*, produced at the Odeon (1911); *La pie borgne* (1921); *Les plaisirs du hasard*, a light-hearted, sparkling play produced in Paris (1922); and *Il faut que chacun soit à sa place* (1924). He also wrote *Valentine* (1924) and *Balzao* (1925, tr. 1927).

**BENN, CAPT. (WILLIAM) WEDGEWOOD** (1877- ). An English public official, who was graduated from the University of London in 1898. A Liberal, he represented St. George's Division, Tower Hamlets, in Parliament (1906-18), and Leith (1918-27), being parliamentary private secretary, in succession, of the Treasury, the Board of Education, and the Admiralty. He was also a Junior Lord of the Treasury (1910-15); a representative of His Majesty's



Office of Works in the House of Commons (1912-14), and of the Insurance Commission (1914). Joining the Labor party in 1927, Benn was elected to Parliament by North Aberdeen in 1928, and on June 7, 1929, he was made Secretary of State for India. For his services during the World War he received, among other awards, the Distinguished Flying Cross, Croix de Guerre, and the Italian War Cross. In 1928 he was created a Companion of the Distinguished Service Order.

**BEN'NETT, (ENOCH) ARNOLD (1867- )**. An English writer (see VOL. III). Some of his later works are *A Great Man* (1915) *Over There: War Scenes on the Western Front* (1915); *These Twain* (1916); *The Lion's Share* (1916); *Books and Persons* (1917); *The Pretty Lady* (1918); *The Roll Call* (1919); *From the Log of the Velsa* (1920); *Our Women: Chapters on the Sea Discord* (1920); *Things That Have Interested Me* (1921); *Mr. Prohack* (1922); *Riceyman Steps* (1923); *Elsie and the Child* (1925); *Lord Raingo* (1926); *The Savour of Life: Essays in Gusto* (1928); *Mediterranean Scenes* (limited ed., 1928); *Accident* (1928); *The Strange Vanguard* (1928); and the plays, *The Tille* (1918), *Judith* (1919), *Sacred and Profane Love*, 2d ed. (1919), *The Love Match* (1922), *The Return Journey* (1928), and, with E. Knoblock, *London Life* (1924), and a dramatization of *Mr. Prohack* (1927).

**BENNETT, RICHARD (1873- )**. An American actor, born at Deacon's Mills, Ind., who made his first stage appearance in Chicago in 1891. He is best known for his characterizations of George DuPont in Brieux's *Damaged Goods* (1914); Julien Brignac in *Maternity*; Chick Hewes in *Kick In*; Peter Marchmont in *The Unknown Purple*; Christopher Armstrong in *For the Defense*; Robert Mayo in Eugene O'Neill's *Beyond the Horizon*; "He" in Andréev's *He Who Gets Slapped* (1922), and the leading rôle in Sir Gerald du Maurier's *The Dancers* (1923).

**BENNINGTON COLLEGE**. An institution of higher learning for women, located at Bennington, Vt., ground for which was broken in the fall of 1929. Student enrollment was to be limited to 325. It will be the pioneer of colleges of the first rank in not requiring students to take subjects prescribed by academic tradition either in the college itself or for entrance. The college will seek to give each matriculant the particular kind of education that, in the opinion of the teachers, will develop individual aptitudes. Buildings will be in the Colonial domestic style and were designed by J. W. Ames and E. S. Dodge of Boston. The total expense of founding the college including buildings, scholarships, and free funds, was estimated at \$4,000,000, more than one-fourth of which was in hand at the beginning of 1929. President: Robert Devore Leigh, Ph.D.

**BENOÎT, be-nwä', PIERRE (1884- )**. A French novelist. Critics found in his work a mixture of the romantic and the entertaining to induce forgetfulness of the sorrows of the World War. Just after the Armistice, *Königsmark* appeared, with the fatalistic setting of a small German principality. Benoit successfully exploited this air of fatality, eventually dispelled by a happy ending, in almost all of his novels. *L'Atlantide* (1919), which earned the author the Grand Prix du Roman of the Académie Française, is an Oriental fairy tale of North Af-

rica. Its art was likened to that of Stevenson's South Sea romances and the story was compared to H. Rider-Haggard's *She*, from which he was accused of plagiarizing. In *Don Carlos* (1920), *Le Lac Salé* (1921), and *La Chaussée des Géants* (1922), his subject was again a woman marked by the finger of doom and saved in the last chapter. His other works include *Les suppliantes*, poems (1920) *L'oublié*; *Mademoiselle de la Ferté* (1923); *La Châtelaine du Liban* (1924); *Les puits de Jacob* (1925); *Le roi lépreux* (1927); and *Axelle* (1928). The majority of M. Benoit's novels have been translated into English.

**BENRIMO, J. HARRY MCALPIN (1874- )**. An American dramatic author and director, born at San Francisco, where he made his first stage appearance in 1892. In 1897 Benrimo acted for the first time in New York (Manhattan Theatre) and in London. Subsequently, he appeared in popular successes in New York and London, but is probably best known as the co-author of *The Yellow Jacket*, with George C. Hazelton (1912). He is also co-author of *Taking Chances* (1916) and *The Willow Tree* (1917). He has lived in London in recent years, devoting his time to stage direction and consultation.

**BENSON, ALLAN L. (1871- )**. An American editor and writer on pacifism, born at Plainwell, Mich. He was a member of the reportorial or editorial staffs of newspapers in Chicago, Salt Lake City, and San Francisco (1890-97); assistant managing editor of the *Detroit Journal* (1897-1901); managing editor of the *Detroit Times* (1901-06), and of the Washington, D. C. *Times* (1906-07); and a writer on political and economic subjects for *Pearson's Magazine* (1908-16), and of signed editorials for *The Appeal to Reason* (Girard, Kan., 1914-16). In 1916, he was nominee of the Socialist Party for President of the United States, but in 1918 he resigned from the party, and in the latter year founded, with W. F. Cochran, the *Reconstruction Magazine*. He is well known as a writer on socialism, government, war, etc., and is author of *The Usurped Power of the Courts* (1911); *Common Sense about the Navy* (reprinted after 1911 by the Anti-preparedness Committee); *The Truth About Socialism* (New York, 1914); *Our Dishonest Constitution* (New York, 1914); *A Way to Prevent War* (1915); *Inviting War to America* (New York, 1916); *What Ford Wages Have Done* (1917); *The New Henry Ford* (1923); *The Story of Geology* (1927); and various magazine articles.

**BENSON, E(DWARD) F(REDERIC) (1867- )**. An English novelist (see VOL. III). His many later novels maintained his place as one of the cleverer and more popular writers. They included *Michael* (1916); *Robin Linnet* (1919); *Dodo Wonders* (1921); *Peter* (1922); *Colin* (1923); *David of King's* (1924); *Colin II* (1925), and *Messaline* (1928). He also wrote *Crescent and Iron Cross*, dealing with the relations of Turkey and Germany before and during the World War (1918); *The White Eagle of Poland*, telling of the German occupation and the reconstruction of that country (1918); *Our Family Affairs, 1867-1896* (1920); *Sir Francis Drake* (1927); *The Life of Aloibiades* (1928); and *Paying Guests* (1929).

**BENSON, SIR FRANK (ROBERT) (1858- )**. An English actor born at Alresford, Hampshire, and educated at Winchester and New College, Oxford. He was knighted in 1916. At Oxford,



Sir Frank appeared in Greek plays; immediately after leaving college, he went on the stage and made his first appearance under Henry Irving at the Lyceum Theatre in *Romeo and Juliet* (1882). He very shortly became manager of his own company and in 1901 founded a dramatic school. After 1888 he managed the Stratford-on-Avon Shakespearean Festival. On the occasion of the Shakespeare centenary, he played the title rôle in *Julius Caesar* and was knighted after the performance.

**BENSON, FRANK WESTON** (1862- ). An American painter, born at Salem, Mass. (see Vol. III). He won the Corcoran Gold Medal and first W. A. Clark Prize of the Corcoran Gallery, Washington (1919); the Logan Medal and Prize from the Art Institute of Chicago (1922); the Logan Prize from the Chicago Society of Etchers (1918); the gold medal at the Philadelphia Sesquicentennial (1926). He is represented in the Metropolitan Museum, New York, the Corcoran Gallery, Washington, and the Art Institute of Chicago.

**BENSON, STELLA** (1892- ). An English writer. Too delicate to attend school, she spent her youth in France, Germany, and Switzerland. She took part in the suffrage movement in 1914, did war work in East London, and after traveling in America and the Orient returned to England in 1921 and married J. C. O'Gorman Anderson. Her novels *I Pose* (1915), *This is the End* (1917), *Living Alone* (1919), *The Poor Man* (1922), *Pipes and a Dancer* (1924), and *Good-bye, Stranger* (1925) are brilliantly written, witty, powerfully descriptive, and original and precise in imagery. But her characters are self-conscious skeptics, this skepticism in the later works turning into a mockery of all effort as futile. She also wrote *Twenty*, poems (1918), *The Little World: Sketches of Travel* (1925), and *Worlds Within Worlds*, a book on travel in the East (1928).

**BENSON, WILLIAM SHEPHERD** (1855- ). An American naval officer, born in Macon, Ga., and educated at the United States Naval Academy. In 1881 he was made ensign and rose through the various grades, becoming lieutenant commander in 1900, captain in 1909, and rear admiral in 1915. He was commandant of the Philadelphia Navy Yard (1913-15) and in 1915 was appointed Chief of Naval Operations. In 1917 he was a member of the commission appointed by President Wilson to confer with the Allies in Europe and was also a member of the special commission abroad. He served as naval representative in drawing up the naval terms of the Armistice with Germany and the Central Powers, and was naval adviser to the American Commission at the Peace Conference at Paris. He continued to serve as Chief of Naval Operations until Sept. 25, 1919, when he was retired by operation of law. In 1920 he was appointed chairman of the United States Shipping Board and in the following year became a commissioner of that board.

**BENTLEY, MADISON** (1870- ). An American psychologist, born at Clinton, Iowa, and educated at the University of Nebraska and Cornell University. He was instructor and assistant professor of psychology at Cornell University from 1898 to 1912 and has been professor and director of the psychological laboratories at the University of Illinois since 1912. He edited and supervised studies in social and general psychology (1916), and critical and experimental studies

in psychology published in 1921, 1924, 1925 and 1927. He also wrote *The Field of Psychology* (1924). He is editor of the *Psychological Index* and took a prominent part in the war activities of the American Psychological Association.

**BÉOCHE, LEGROS.** See **DÉRAUD, HENRI**.

**DÉRAUD, HENRI** (1885- ). A French novelist born at Lyons. Although he began publishing in 1905, he attained prominence only in 1922 when the Académie Goncourt crowned his two novels *La martyre d'un obèse* and *Peau de fesse*. Among his other works are *L'Héritage des Symbolistes* (1905), *Les morts lyriques* (1912), *Le vitriol de lune* (1921); *Lacaze* (1924, tr. 1925); *Ce que j'ai vu à Moscou* (1925, tr. 1926); *Le bois du templeur perdu* (1926); *Mon ami Robespierre* (1927, tr. 1928); *La gerbe d'or* (1928); *Twelve Portraits of the French Revolution* (1928); *The Discoverer, Columbus* (1928), and *Rendez-vous Européens* (1928). M. Déraud sometimes used the pseudonyms Urbain Dhéré and Legros Béoche.

**BERBER, FELIX** (1871- ). A noted German violinist, born at Jena. He studied at the conservatories of Dresden and Leipzig (under Brodsky) and made a most successful début in London, in 1889. From 1891-96 he was concertmaster in Magdeburg, 1896-98 in Chemnitz and 1898-1902 of the Gewandhaus Orchestra in Leipzig. In 1904 he accepted the professorship at the Akademie der Tonkunst in Munich, but in 1907 was called as Heermann's successor to the Hoch Conservatory in Frankfurt, and in 1908 succeeded Marteau at the Conservatory of Geneva. In 1920 he returned to his former position in Munich and there also established his own string quartet with his wife, Milly, Härtl, and Köhler.

**BERCHTOLD, LEOPOLD, COUNT** (1863- ). A former Austro-Hungarian Foreign Minister (see Vol. III). After the outbreak of the World War, he tried to persuade Italy and Rumania to fulfill their obligations to Austria and bent all his energy to securing new allies for the Central Powers. He was, however, unsuccessful for the most part, as he would not consent to the concession of Austrian territory, even though Germany urged it. He came into conflict with German statesmen and military leaders, accusing them of not supporting Austria sufficiently against Russia. In 1915 he fell from power, and the following year was appointed Lord High Steward to Charles Francis Joseph, the heir to the throne. Later, he became Lord High Chamberlain but retired from politics on the fall of the dynasty.

**BERCOVICI, KONRAD** (1882- ). A Rumanian author (resident in the United States since 1916). He was privately educated and wrote: *Crimes of Charity* (1917); *Dust of New York* (1918); *Ghitza* (1919); *Murdo* (1921); *The Story of the Gypsies* (1928); *Alcazander* (1928); *Nights Abroad* (1928); and *Costa's Daughter*, a play.

**BEREA COLLEGE.** A non-sectarian, coeducational institution at Berea, Ky., founded in 1855 in the special interest of the mountain people of the Southern Appalachians. The curriculum was divided into five departments: College, normal school, training school, academy, and foundation-junior high school. The college department registered a growth between 1914 and 1928 from 104 students to 437; and the total registration in 1928 was 1942. There was also a summer session enrollment of 453, of whom

191 were in the college, 167 in the normal school, and 95 in the academy. The faculty in 1928 numbered 104, and the library was increased from 26,000 to 57,779 volumes. Six brick dormitory and educational buildings were constructed within the decade 1914-1924, besides a hospital and detention ward accommodating 150 patients. A weaving industry was established, and a broom industry, the latter in 1922-1923 turning out more than 7200 dozen brooms. The college maintained a dairy, a farm, a garden, a forest, and a cannery, in order to reduce the cost of maintenance, so that no student should be debarred because of expenses. Developments following 1923 included the erection of a gymnasium for women and one for men; a new dormitory for women in the normal school; a home economics building; a new science building; and an animal husbandry building. Changes in curriculum included the addition of the ninth grade to the Foundation school; the adoption of senior high-school courses in the academy; the discontinuance of the vocational department; and the establishment of a vocational department. President, the Reverend William J. Hutchins, D.D.

**BERENSON, BERNARD** (1865- ). An American art critic (see VOL. III). His recent publications include: *Venetian Painting in America, the Fourteenth Century* (New York, 1916); *Essays in the Study of Siennese Painting* (ib., 1918); and *Three Essays in Method* (1927). He compiled catalogues of the Italian paintings in the Widener and Friedsam collections.

**BERENT, WACLAV** (1873- ). A Polish writer, born at Warsaw. He attracted attention by his remarkable characterization of modern types in the novels *Fachowiec* (1903) and *Prochno* (1904), the latter a profound analysis of the metropolitan decadent artist. Other stories were *Ozmine* (1911) and *Zwe Kamienie* (1922). He made a successful début as a dramatist and was looked on as the coming Polish writer in this field. He also collaborated on a Polish edition of Nietzsche.

**BERESFORD, bër'es-fêrd, JOHN DAVYS** (1873- ). An English author, born at Castor, near Peterborough, and educated at Oundle and Peterborough. He studied architecture in London but gave it up to turn to writing, and published several plays and many novels, in which he has portrayed characters exceptionally real. His style is dry but is vitalized by unusual psychological insight. His publications include the *Jacob Stahl* trilogy (1911-12); *Goslings* (1913); *The Mountains of the Moon* (1915); *These Lynnekers* (1916); *The Wonder* (1918); *The Jervaise Comedy* (1919); *The Prisoners of Hartling* (1922); *Love's Pilgrim* (1923); *Unity* (1924); *The Monkey Puzzle* (1925); *That Kind of Man* (1926); *The Tapestry* (1927); *The Instrument of Destiny* (his first crime story, 1928), and *Writing Aloud* (1928).

**BERG, ALBAN** (1885- ). An Austrian composer, born in Vienna. He studied composition with Arnold Schönberg, adopting unconditionally the latter's revolutionary ideas and becoming one of his most active propagandists. In 1925 he was elected a director of the Austrian branch of the International Society for Contemporary Music. He is one of the extreme futurists. His opera *Wozzek* (Berlin, 1926) has made the rounds of several of the important opera houses of Austria and Germany.

**BERG, DAVID ERIC** (1890- ). An American sociologist, born at Minneapolis, Minn., and educated at the University of Minnesota. He was successively superintendent of schools in various Minnesota towns (1912-14), with the University of Wisconsin survey (1914), and a member of the Madison (Wis.) Chamber of Commerce (1915). In 1915-16 he was assistant director of the Bureau of Municipal Research in Akron, Ohio, in 1917 assistant secretary of the Committee on Criminal Courts of the Charity Organization Society of New York City, and from 1917 to 1921 secretary of the Charities and Welfare Committee of the Philadelphia Chamber of Commerce. He was also secretary of the Americanization Bureau and of the Philadelphia Welfare Federation. In 1918 he was lecturer on social statistics at Fordham University. During the War, he fought with the American forces in France. He is author of *Pick Your Prof.* (1920) and *Personality Culture by College Faculties* (1920). He was managing editor of *Fundamentals of Musical Art*.

**BERGEN.** A seaport city of Norway. The population in 1920 was 91,443. The area is 13.5 square miles. In 1927, 831 vessels of 711,876 net tonnage were entered, and 643 vessels of 511,916 net tonnage were cleared. At Tyskebryggen (the German Quay) is a solid block of quaint timber buildings erected in the fifteenth century by the Hanseatic League. The 16 gaards, or buildings, served not only as offices, salesrooms, and warehouses but as living quarters for the merchants and their assistants. Business is still carried on in these buildings, but the best preserved has been converted into what is known as the Hanseatic Museum. This museum portrays to the minutest detail the life which was lived in this town within a town five and six centuries ago. The town had its own laws and regulations, courts, police, etc., and allowed no Norwegian within the gates after nightfall. All new buildings which have been erected along the quay have been built in the style of the fifteenth century. Bergen has a fine municipal theatre, beautiful parks, good art galleries, and a famous zoological and oceanographical museum. Statues have been erected in its public squares to Holberg, the father of modern Scandinavian literature; to Ole Bull, the great violinist; and to Edvard Grieg (1843-1907), the composer, whose home, Trolldhaugen, has been preserved as a memorial museum and shrine.

**BERGENGREN, RALPH WILHELM ALEXIS** (1871- ). An American essayist, born at Gloucester, Mass., and educated at Harvard University. He was cartoonist for the Boston *Sunday Globe* (1897-99), dramatic critic and editorial writer for the Boston *Budget*, a member of the editorial staff of the Boston Publicity Bureau (1902-05), an art critic for the Boston *Advertiser* (1904-07). He is the author of several volumes of humorous, informal essays and of a book of poems for children. His works include *The Comforts of Home* (Boston, 1918). *The Perfect Gentleman* (Boston 1919), *The Seven Ages of Man* (Boston, 1921), *David, the Dreamer* (Boston, 1922), and *Gentlemen All and Merry Companions* (Boston, 1922).

**BERGER, VICTOR L.** (1860-1929). An American Socialist editor and Congressman (see VOL. III). He never became acquiescent toward the World War and often wrote against it with the result that he, in company with four other Socialists, was brought to trial for violation of

the Espionage Act in December, 1918. After a bitter legal battle which attracted national attention, he was found guilty (Jan. 8, 1919) and sentenced to prison for 20 years. The House of Representatives, in November, voted his exclusion from the seat to which he had been elected the year previous. In December, 1919, he was once again elected by his Milwaukee constituency and was again denied his seat. In January, 1921, the United States Supreme Court reversed his conviction; in November, 1922, the indictments against him were dismissed; and in the same month he was returned for the fourth time to Congress, this time as the only Socialist Party representative. He was finally seated on Dec. 3, 1923. He was reelected to the 69th and 70th Congresses but was defeated when he ran again in November, 1928. His socialist doctrine was modeled after that of the German revisionist school of Kautsky and Bernstein, and therefore he rejected Sovietism. In 1924, with Morris Hillquit and others, he supported the candidacy of Robert M. La Follette for President. He was delegate of the American Socialist Party to the International Socialist Congress at Marseilles, France, in 1925. After 1927 he was chairman of the National Executive Committee of the Socialist Party. He died Aug. 7, 1929, from injuries received in a street car accident.

**BERGER, VILHELM** (1867- ). A Swedish-American editor and author, born at Värmland, Sweden; he was educated in the high school there and later in Upsala College, N. J. He was traveling agent for Swedish-American publications (1897-1903), editor of New York *Nordstjernan* (1903-13 and 1915- ), and office manager and director of the Swedish Lutheran Immigrant Home (1913-15) and the Swedish Augustana Home for the Aged, Brooklyn. He is the author of numerous books in Swedish, dealing especially with the problems and conditions of the Swedes in America, published from 1902 to 1925.

**BERGONIÉ, JEAN-ALBAN** (1867-1925). A French electrotherapist and radium investigator who was graduated in medicine at the University of Bordeaux in 1883 and was later appointed professor of biological physics and electrotherapy there. After 1893 he edited the *Archives d'Electricité Médicale*, a periodical of great merit. He studied and wrote upon the physical phenomena of the muscles and the application of physics to medicine. His device for localizing metal bodies in a human subject was employed during the World War. He twice received the Gold Medal of the Carnegie Foundation. While engaged in an effort to produce a cure for cancer he received radium and X-ray injuries from which he later died.

**BERGSON, berg'sôn', HENRI LOUIS** (1859- ). The most notable of contemporary French philosophers (see Vol. III). He was elected a member of the French Academy in the spring of 1914, already having become a member of the Academy of Moral and Political Science in 1903. The World War caused an interruption of his philosophic activity and he devoted his talent to the French cause. Besides publishing a pamphlet on the *Significance de la Guerre* (1915), he went twice on diplomatic missions to Washington and was instrumental in preventing the recognition of the Soviet government by the United States. On the occasion of the San Francisco Exposition, he pre-

pared a short survey of French philosophy, published in the collection *La Science Française*, 2 vols., (1915); this constituted his only scientific production during the four years of hostilities. In 1918, the Academy having resumed its meetings, Bergson delivered an address before it on the life and works of his predecessor in its membership, Émile Ollivier. This was published with the *Discours de Reception*, by René Doumic (1918). At the close of the War, Bergson gathered up a number of his shorter writings and published them under the title of *L'Énergie Spirituelle* (1919), translated into English as *Mind Energy* (1920). He took a leave of absence from the Collège de France in 1919 in order to devote himself to philosophic writing, and at the beginning of 1922 he resigned his chair definitely. Bergson was at work for some time on the revision of the Gifford lectures delivered in 1912. In 1922 a short volume came out, *Durée et Simultanéité d'après la Théorie d'Einstein*. As the title suggests, the book attempted to reconcile the theory of relativity with the Bergsonian conception of duration. He insisted that the relativity of mathematical times, which depends necessarily on the orientation of the observer, does not preclude the existence of an absolute qualitative time, revealed by psychological introspection. He attacked therefore not the mathematical theory of Einstein but the metaphysical interpretations which have been grafted on it. He headed the French delegation which aided in the formation of the League of Nations' Institute of Intellectual Coöperation, and in 1928 he received the Nobel Prize for Literature for 1927.

The literature on Bergson's philosophy continued to increase at a rate which made him the subject of more commentaries than any other modern thinker except Kant. Among the recent books in English are H. Wilden Carr's *The Philosophy of Change* (1914); and G. W. Cunningham's *Study in the Philosophy of Bergson* (1916); J. Alexander Gunn's *Bergson* (1921); and Mrs. Karin Stephen's *The Misuse of Mind* (1922).

**BERKEY, CHARLES PETER** (1867- ). An American geologist, born at Goshen, Ind., and educated at the University of Minnesota. In 1892-1903 he was an instructor in geology at Minnesota, and in the latter year went to Columbia, where he became a full professor in 1916. He was assistant geologist of State surveys of Minnesota, Wisconsin, and New York. More recently, as consulting geologist to the New York City Board of Water Supply he made an elaborate investigation of the geology of the Catskill Aqueduct region. His original researches have also included studies on the geology of Porto Rico and China. Since 1922 he has been geologist of the Asiatic Expedition conducted by the American Museum of Natural History. In 1929 he was a member of the board of engineers and geologists which reported on the Boulder Dam.

**BERKSHIRE FESTIVAL.** See Music, under *Chamber Music*.

**BERLIN, bër-lin'; Ger. pron. bër-län.** The capital of Germany and of the Republican State of Prussia (see Vol. III). In 1915 Berlin covered 26.91 square miles and had 1,879,000 inhabitants; on Oct. 1, 1920, with the enlargement of the city by the attachment of various suburban districts to it, it had 339 square miles and 3,803,785 inhabitants; and by the census of June 16, 1925, while the area remained the same, the

population rose to 4,024,165. This means that, in area Berlin is the largest city in the world, while, if judged according to population, she ranks third, London and New York being larger.

**Government.** As the capital of the Reich, Berlin is the seat of most of the imperial governmental departments and activities. On Oct. 1, 1920, she absorbed various suburbs and rural communes, and was divided into twenty districts, the first six of which correspond to the earlier Berlin. The administration is under the Oberpräsident of the Province of Brandenburg, the magistrates, and the city Representative Assembly. The magistracy has at most 30 members, including the chief mayor, the mayors, and at least 12 unpaid city councillors. The city Assembly is made up of 225 members. For local administration each district has its own organization, mayor, attorney; several sectional councils, a district assembly of from 15 to 45 members, and a police headquarters. Justice is administered by a supreme court of judicature, 3 general courts, 10 tribunals, and industrial and commercial courts. For the purpose of electing city representatives, the 20 districts become 15 by grouping several of them together.

**Industry and Commerce.** Berlin continues to manufacture nearly every article of domestic and industrial use, the most important now being the electrical and lighting industries, iron foundries, machinery factories, and the film and radio industries. After a long period of slight activity, the clothing trades, particularly that of women's coats, are getting on their feet again. Commercially, Berlin is the centre of every kind of transportation: by rail, water, and air. Twelve main railroad lines enter the city; her rivers and canals connect her with Hamburg and Stettin, and the Elbe and Oder Rivers; she is the centre of Germany's very regular passenger, post, and freight airplane service. She has two air ports, Tempelhof and Staaken, and the service is recognized as one of the best and safest in Europe. Internally, she has extended her subways from Potsdamer Platz to Gesundbrunnen, and from Bellealliance Platz to Wedding (1924). The city is gradually spreading out, particularly to the west, so that the Kurfürstendamm and the section through which it passes has become one of the important business, residential, and amusement centres.

**Buildings.** After the Empire, the Republican government has turned some of the palaces into museums: in 1919 that of the former Crown Prince was opened as a new branch of the National Gallery, housing modern art, and in September, 1921, the Schloss (former palace of the Emperor) was opened as a museum where the exhibitions of the Industrial Arts Museum were shown in the former State Apartments. The Administrative Academy (1919), a Political Academy (1920), the Sports Forum Academy for Bodily Exercises (1920), and the German Institute for Foreigners were founded, and on Oct. 1, 1922, the City Vocational School Body went into office. By uniting the vocational schools it was found possible to start training schools for the smaller callings. The United States has occupied its own embassy since April, 1919.

**History.** During Christmas week, 1918, and from Jan. 5 to 13, 1919, the city was in a state of revolution due to the revolt of a naval division and to the Spartacists under Karl Liebknecht and Rosa Luxemburg. Because of the lack of order, the National Constitutional Assembly

could not meet there but sat in Weimar (Feb.-Aug., 1919). From March 13 to 17, 1920, occurred the Kapp Putsch, when Kapp, a right wing conservative, with the military aid of von Luttwitz, took over the city government by force. After four days, he fled. After that time conditions became normal.

**Bibliography.** *Berlin und Umgebung* by Karl Baedeker (10th ed., 1921); *Berlin im Weltkrieg*, by Ernst Kaeber (1921); *Probleme der neuen Stadt Berlin*, edited by Hans Brenner and E. O. Stein (1920); *Fünfzig Jahre Berliner Stadt-entwässerung*, by H. Hahn and F. Langbein (1928); *Graphisch-statistische Darstellungen von Berlin*, published by the Statistical Office (1928), and the *Year Books* and various reports of the Statistical Office of Berlin.

**BERLIN, IRVING** (1888- ). An American composer, born in Russia and educated in the public schools of New York City. At 16, Berlin commenced his career as a performer in the restaurants and cafés of New York. *Alexander's Rag-Time Band* (1905) established his position as the king of syncopation. He is the writer and composer of the musical plays and revues, *Watch Your Step* (1914); *Stop! Look! Listen!* (1915); *The Century Girl*, with Victor Herbert (1916); *The Ziegfeld Follies of 1918*; *The Canary*, with Ivan Caryll (1918), and many other popular song and dance successes. He is the proprietor, with Sam H. Harris, of the Music Box (New York) and composed the score of the *Music Box Revues* for 1921, 1922, and 1923.

**BERLINER, EMILE** (1851-1929). A German-American inventor (see Vol. III). He was president of the District of Columbia Tuberculosis Association (1915-25). In November, 1919, under his direction, his son, Henry A. Berliner, designed and used one of the first successful helicopters. In 1925 he invented the acoustic tile.

**BERLINER, HENRY A.** (1895- ). An engineer, born Washington, D. C., son of the inventor Emile Berliner, and educated in Washington and at Cornell and the Massachusetts Institute of Technology. He designed, constructed, and flew the helicopter (1919) on which his father had experimented since 1903, and in 1924 was engaged in helicopter development.

**BERMUDA ISLANDS.** The British colony composed of approximately 350 small islands lying 518 miles east of Cape Hatteras. The area of the group is 19.3 square miles; the population, in 1926, 30,113, of whom 15,613 were white. The chief town, Hamilton, on the Island of Bermuda, has a population of 3000. Barely one-third of the area is fit for cultivation and on this are planted early spring leguminous crops for the United States market. Similarly, most of the commodities imported come from the United States. The import trade totaled, in 1926, £1,404,824; and exports £239,553. In 1925 the total tonnage cleared was 2,749,780. Until 1920, alcoholic liquors were exported to the United States in large quantities, but, with the coming of prohibition and the falling off of this traffic, experiments were conducted for the conversion of the alcohol into motor spirits. The Bermudas continue to attract American tourists and winter colonists, as many as 28,000 making their residence there annually.

**BERNARD, bernâr', (PAUL) TRISTAN** (1866- ). A French wit, writer of comedies and novels who was born in Besançon. Besides

many one-act comedies, his works include the longer comedies *Sa Sœur* (1907), *Le poulailler* (1909), *Les phares Soubigou* (1913), and *Un perdreau de l'année* (1926); the novels *Mathilde et ses mitaines*, *L'Enfant prodigue du Vesinet* (1921), *Le jeu de massacre* (1921) and *Le voyage imprévu* (1928); *Le poilu civil*, gazette d'un immobilisé (1915); and *Souvenirs épars d'un ancien cavalier* (1917).

**BERNARDES, ARTHUR DE SILVA** (1875- ). A president of Brazil, born at Vicosá, Minas Geraes. After two years at Caraca College, he became a clerk in a store at the age of 13 to earn enough to begin a college course at Ouro Preto. He maintained himself there by doing newspaper work. Later, he took up law and began practice at Vicosá. He was elected to the Congress of his native state, was its first secretary, and later secretary of the treasury of Minas Geraes. In September, 1918, he was elected Governor of Minas Geraes, and was occupying this position when he was made President of Brazil for 1922-28. In 1924 and 1925, there were frequent revolutionary movements in the country. See BRAZIL.

**BERNAUER, RUDOLF** (1880- ). A librettist known chiefly for his adaptation, with Carl Meinhard, of the play *Johannes Kreisler*, from *Die Wunderlichen Geschichten des Kapellmeister Kreisler*, produced in New York (1922-23). Bernauer also wrote, with L. Jacobson and O. Straus, the comic opera, *The Chocolate Soldier*, founded on *Arms and the Man*, by George Bernard Shaw and revived at the Century Theatre in 1921.

**BERNHARDI, FRIEDRICH VON** (1849- ). A German military leader and writer, born at Petrograd. He served in the Franco-Prussian War, and from 1891 to 1894 was at Berne as military attaché; later, he went to Berlin as head of the history department of the Grand General Staff. He was general of cavalry and commander of the 7th Army Corps from 1907 to 1909, retiring in the latter year to write on military subjects. He attracted international attention by his book, *Germany and the Next War* (1912). At the outbreak of the World War, he was again given command of an army corps and served with distinction on the Stochod and on the Western front. He published in English *Cavalry in War and Peace* (1910); *On War of To-day* (1914); and *Britain as Germany's Vassal* (1914).

**BERNHARDT, BERNHART, SARAH** (1844-1923). A French actress (see VOL. III). In 1914, at the age of 70, the great tragedian was forced to undergo a leg amputation. Despite this disability, she refused to abandon the stage. She carried out a successful tour of America in 1915 and, on returning to France, she played in her own productions almost continuously until her death, March 26, 1923. Her later successes included *Daniel* (1920), Maurice Rostand's *La Hôlice* (1921), and M. Verneuil's *Regine Armand* (1922). Her physical condition confined her practically to immobility on the stage, but the charm of her voice, which had altered little with age, insured her triumphs.

**BERNHEIM, BERTRAM MOSES** (1880- ). An American surgeon, born at Paducah, Ky., and educated at Johns Hopkins and in Europe. He is known for his original work in blood transfusion and surgery of blood vessels. During the World War, he served with the Johns Hopkins Hospital Base Unit, later becoming associ-

ate in clinical surgery at the Johns Hopkins Medical School. He wrote *Surgery of the Vascular System* (1913); *Blood Transfusion* (1917), and a volume of his experiences at the front in the World War, *Passed as Censored* (1918).

**BERNHEIM, HIPOLYTE** (1840-1919). A French physician, known for his investigation of suggestion as a cause and remedy for disease. With his chief, Liébeault, he founded the so-called Nancy school of psychotherapeutics, although he remained throughout a general practitioner of medicine and professor of medicine in the local university. His books were widely translated and his clinic at Nancy was visited by physicians from many countries. His first book, devoted to general medicine, *Leçons de Clinique Médicale*, appeared in 1877 and was translated into Spanish. His first work on suggestion, *De la Suggestion et de Ses Applications à la Thérapeutique* (1888), was translated into German by Freud and also into English. *Hypnotisme, Suggestion et Psychothérapie* appeared in 1891; *L'Hystérie* (1913); *L'aphasie* (1914); and *Automatisme et Suggestion* (1917).

**BERNSTEIN, EDUARD** (1850- ). A German public official (see VOL. III). In 1920 he was again elected to the Reichstag and became Town Councillor of Berlin. He also published a new edition of his book *Voraussetzung des Sozialismus und Anfang der Sozialdemokratie* (1915), besides *Völkerrecht und Völker-Politik* (1910) and *Wirtschaftswesen und Wirtschaftswerden* (1920). He also edited the complete works of Ferdinand Lassalle.

**BERNSTEIN, ELSA** ("ERNEST ROSMER") (1866- ). A German dramatist, born at Vienna. She is the wife of Dr. Max Bernstein, a prominent lawyer and successful playwright of Munich. She was an actress but left the stage on account of failing eyesight and wrote the dramas *Wir Drei* (1893) and *Dämmerung* (1894), and a volume of stories, *Madonna*. Her greatest success was achieved with the poetical drama *Königskinder* (1899), which was played by Sir Arthur Harvey and his company in New York under the title *Children of the King*. The play was made the libretto of Humperdinck's opera *Königskinder*, in which Geraldine Farrar excelled as the Goose-girl. Other works of Frau Bernstein are *Tedeum*, a comedy of musical life, the tragedies *Thémistocles* and *Achilles* (1910); the dramas *Daguy*, *Mérelle*, *Johannes Herkner*, *Mutter Maria* (1900); *Nausikaa* (1906); *Maria Arndt* (1908); and *Schicksal* (1914). Since the World War, she has published *Erkennung*, a comedy; *Achilles*, a tragedy; the dramas, *Ehe* and *Johannes Kepler*, and the dramatic scenes, *Requiem*.

**BERNSTEIN, HENRY** (LÉON GUSTAVE CHARLES) (1875- ). A French dramatist (see VOL. III), who continued to occupy a leading position among writers of high-class theatrical thrillers. His war play, *L'Élévation* (1917), was acclaimed in France and the United States, where it was produced with Grace George (1917-18), as a drama of spiritual rebirth. The play dealt with the customary French triangle and attempted to show a purification of emotions in the white heat of the World War. *The Claw* was produced in the United States in 1921 with Lionel Barrymore and Irene Fenwick in the leading rôles. He wrote *Judith* in 1920, and *La galerie des glaces* in 1920.

**BERNSTEIN, HERMAN** (1876- ). An American journalist and translator of Russian



literature. He was born at Neustadt-Scherwindt, Poland, of Russian parents, and emigrated to the United States in 1893. He visited Europe at various times during a long period of years as special correspondent of American newspapers including the *New York Times*, 1908-12 and 1915; the *New York Herald* (1917-19), and the *New York American* (1920-21). He was founder and editor of the *The Day* (1914-16) and editor-in-chief of *The American Hebrew* (1916-19). He wrote a number of poems and a novel, *Contrite Hearts*, of orthodox Jewish family life but is better known for his translations of Russian authors, especially Andréev, and for his discovery and publication of the secret telegrams exchanged between the Czar and the Kaiser (1904-07), known as the *Willy-Nicky Correspondence*. He is also the author of *Celebrities of Our Time* (1925) and *The Road to Peace* (1926). He is contributing editor of the *Jewish Tribune*.

**BERNSTORFF, JOHANN-HEINRICH A.**, COUNT VON (1862- ). A German diplomat and Ambassador plenipotentiary to the United States from 1908 until the entrance of the latter into the World War (see Vol. III). After leaving Washington, he served at Constantinople, and following the Revolution was prominent in the peace discussions of the foreign department. Since 1921 a member of the Diet and founder of the Democratic Club, he has been repeatedly sent on official missions to Geneva.

**BERRY, EDWARD WILBER** (1875- ). An American palaeobotanist, born at Newark, N. J., and educated privately. He was successively treasurer, manager, and president of the *Passaic* (N. J.) *Daily News* from 1897 to 1905 and in the latter year joined the teaching staff of Johns Hopkins University, becoming professor of palaeobotany in 1917. In 1919 he visited South America as a member of the Williams Memorial Expedition. Since 1910 he has been associated with the United States Geological Survey and has contributed to its publications important memoirs on the floras of southeastern North America, on which he is considered an outstanding authority. After 1917 he held the office of assistant State Geologist of Maryland. In 1901 he received the Walker Prize of the Boston Society of Natural History. He is the author of more than two hundred scientific papers and a book, *Tree Ancestors* (1923).

**BERRY, MARTHA MCCLESNEY** (1866- ). An American promoter of education in the South. She was born near Rome, Ga., attended private schools, and had the advantages of European travel. In 1902 she founded and has since directed the Berry Schools for mountain boys and girls at Mount Berry, Ga. Because of the rapid increase in attendance at the schools, Miss Berry was compelled to raise about \$150,000 a year by personal effort to supplement the income from the limited endowment. In 1928 a campaign was started in New York to add \$2,500,000 to the permanent endowment fund of the schools. In 1925 the Roosevelt Medal was awarded to Miss Berry for her services to the nation and in 1928 she received an award of \$5,000 from the *Pictorial Review* for her twenty-six years of labor on behalf of Southern youth.

**BERTHELOT, PHILIPPE JOSEPH LOUIS** (1866- ). A French diplomat and son of Marcellin Berthelot, the famous savant and statesman. He passed through the regular apprenticeship of the diplomatic career and ad-

vanced rapidly to the position of *Chef de Cabinet* and finally to secretary-general of the Quai d'Orsay, with the rank of ambassador (1920), and in 1921 he was a member of the French delegation to the Washington Disarmament Conference. Premier Briand was compelled to put Berthelot on the retired list for 10 years in 1921 when his name was involved in the difficulties of the Banque Industrielle de Chine. Despite this political scandal, he was recognized as one of the ablest diplomats in France, and in 1925 he returned to the Ministry of Foreign Affairs as general-secretary, and in 1926 was a delegate to the Franco-Soviet Conference.

**BERTOLINI, BERTÉ-LÉNÉ, PIETRO** (1853-1920). An Italian statesman, born at Montebelluna. He devoted himself to economic and administrative questions and represented his native town in the Italian Parliament (1891). After holding various public offices and the Ministries of Public Works (1907) and of the Colonies (1912), he became a supporter of the extension of the suffrage bill and devised a system for allowing illiterates to vote and at the same time reducing electoral corruption. He remained in retirement during the World War, was afterward appointed Senator, and headed the Italian delegation to the Reparations Commission. He wrote several important works on politics, economy, and local government in England.

**BERTRAND, BÉRTRÂN, LOUIS (MARIE ÉMILE)** (1866- ). A French novelist, disciple of Flaubert, who sought to continue the naturalistic and psychological novel. He was born at Spincourt, Meuse, attended the lycée at Bar-le-Duc, the Lycée Henri IV, and the École Normale Supérieure. For nine years, he was professor of rhetoric in the lycée in Algiers (1891-1900), and he frequently used Africa as the setting for his stories. In 1925 he was elected to the French Academy to take the place of Maurice Barrès. His works include the novels *Le sang des races* (1899), *La Cina* (1901), *Pépète le bien aimé* (1904), *Mademoiselle de Jessincourt* (1911), *Sanguis Martyrum* (1917), *L'Infante* (1920), *Les villes d'or* (1921), and *Jean Perbal* (1925); and the following biography, criticism, or travel descriptions: *La fin du classicisme et le retour à l'antique* (1897), *Le jardin de la mort* (1905), *Saint Augustin* (1913, tr. 1914), *Flaubert à Paris, ou le mort vivant* (1921), *Louis XIV* (1923, tr. 1928); *Devant l'Islam* (1926); *Idées et Portraits* (1927), and *Sainte Thérèse* (1927). Consult *The African Novels of Louis Bertrand*, by David Clark Cabeen (1922) and *Le victorieux XX<sup>e</sup> siècle*, by Pierre Moreau (1925).

**BERWALD, WILLIAM** (1864- ). An orchestra conductor, born at Schwerin, Germany. A pupil of Rheinberger and Faiszt, he began his career as conductor of the Philharmonic Society at Libau in Russia. In 1892 he settled in Syracuse, N. Y., where he has since been head of the department of musical theory at the University. From 1922-4 he was conductor of the newly organized Syracuse Symphony Orchestra. As a composer, he is known by his cantatas, *The Seven Last Words of Christ* and *Crucifixion and Resurrection*; two overtures for orchestra; chamber music; and many songs and pieces for the piano.

**BESANT, BÉS'ANT, MRS. ANNIE** (1847- ). An English theosophist and social worker (see Vol. III). She was elected president of the Theosophical Society in 1907, 1914, and 1921,



and edited the Madras daily, *New India*. She founded the Home Rule League for India and was chosen its president (1916), also being president of the Indian National Congress (1917), and general-secretary of the National Convention of India (1923). She traveled widely, visiting the United States and England among other countries and working for the spread of theosophical doctrines. Her many later works include *The Basis of Morality* (1915); *Reincarnation: its Answers to Life's Problems* (1915); *A World Religion* (1916); *H. P. Blavatsky and the Masters of the Wisdom* (1918); *Man's Life in Three Worlds: a Booklet for Beginners* (1919); *Psychology* (1919); *Annie Besant: an Autobiography* (1920); *The Riddle of Life and How Theosophy Answers It* (1922); *Theosophical Christianity* (1922); *India, Bond or Free?* (1926); and *World Problems of To-day* (1926). Consult *A Bibliography of Annie Besant*, by Theodore Besterman (1924) and *Mrs. Annie Besant*, by Geoffrey West (1927).

**BESELER, HANS VON** (1850- ). A German soldier, born at Groiswald in Prussia. In the World War, he led the assault on Antwerp, which he took on Oct. 9, 1914. With the occupation of Poland in 1915, he became German Governor at Warsaw where his attempts to set up a Polish national government buttressed by German arms met with only slight success. In 1918 the Armistice ended his activities.

**BESNARD, bâs'nâr', PAUL ALBERT** (1840- ). A French painter (see VOL. III) who was head of the French School at Rome (1913-21) and became director of the École des Beaux Arts in Paris in 1922. He was represented in the official exhibition of French art held in the United States in 1919-20 by a symbolic portrait of Cardinal Mercier and an important exhibition of his works was shown in different cities of the United States in 1924. He became a member of the French Academy, of the Académie des Beaux Arts, and an honorary member of the Royal Academy of England. He wrote *L'homme en rose* (1913) and *Sous le ciel de Rome*.

**BESREDKA, AELXANDRE** (1870- ). A French physician, who was graduated in medicine at the University of Paris in 1897. Having joined the staff of the Pasteur Institute, Paris, he published *Anaphylaxie et Anti-anaphylaxie* (1917); *Histoire d'une idée*, dealing with the work of Professor Metschnikoff (1921); *Immunitisation local; pansement spécifique* (1925; English trans. by Dr. H. Plotz, 1927); and *Études sur l'immunité dans les maladies infectieuses* (1928). Besredka, as well as considerable numbers of Jews, Poles, Bulgars, Armenians, and Tatars. The collapse of the Russian Empire in 1917 gave impetus to the separatist movement, which had long attracted the enthusiasm of the Rumanians in the province, with the result that a request was made to the new republican government for the establishment of an autonomous Bessarabia. But the success of the Bolshevik revolution encouraged the Rumanians to hope for loftier things. On Dec. 15,

1917, a "Council of the Land" proclaimed Bessarabia free, under the name "Moldavain Republic." Its independence, however, was short-lived. The hostility of the Ukrainians prompted the Rumanian government to send an army into the country and commence a carefully fostered agitation for annexation. From January, 1918, on, in spite of an Allied attempt in March to bring Rumania and Soviet Russia to terms, the Rumanians remained in occupation of the country. The Bessarabian National Council, which was erected by the Rumanians, twice, in 1918, asked for annexation to Rumania. Conversations were carried on between Russia and Rumania in 1919 and 1920, but unknown to Russia, Rumania at the very moment was secretly treating with the Allies. On Oct. 28, 1920, a treaty was signed by which Great Britain, France, Italy, and Japan recognized Rumania's sovereignty over Bessarabia.

**BEST, CHARLES HERBERT** (1890- ). An American physiologist. He was born at West Pembroke, Me., and graduated at the University of Toronto, Ontario, Can., in 1921. He pursued his medical studies at that university, coöperating with Dr. F. G. Banting, on the chemical side, in the memorable experiments that led to the discovery of insulin as a remedy for diabetes, and since 1924 has been assistant professor of physiological hygiene and research associate of the Banting-Best Chair of medical research there. He is especially distinguished for his researches on insulin and carbohydrate metabolism.

**BEST, HARRY** (1880- ). An American sociologist, especially interested in the problem of the deaf, dumb, and blind. He was born at Millersburg, Ky., and educated at Centre College, Danville Ky., George Washington University, Gallaudet College (Washington), Columbia University, and the New York Law School. Before 1912 he held various instructorships in schools and colleges for the deaf and dumb. He was a resident worker in the University Settlement in New York from 1912 to 1919, and in the latter year became professor of sociology in the University of Kentucky. He is the author of two standard texts, *The Deaf* (1914), and *The Blind* (1919); also *The Blind Population of the United States* (1927); *The Deaf-Mute Population of the United States* (1927); and of contributions to periodicals.

**BESTELMEYER, bêt'el-mî-ër, GERMAN** (1874- ). A German architect born in Munich. He studied at Ansbach, Munich, and Nuremberg. He designed the new University buildings at Munich, the Germanic Museum in Nuremberg, the new Technical High School in Munich, and the German Museum of Harvard University. He was honorary member of the Societies of Architects of Berlin, Munich, Vienna, and Dresden.

**BESTOR, ARTHUR EUGENE** (1879- ). A president of Chautauqua Institution, born at Dixon, Ill., and educated at the University of Chicago. He was professor of history and political science at Franklin College, Ind., 1901-03, and lecturer on political science at the Extension Division of the University of Chicago, 1904-12. He was assistant general director of Chautauqua Institution, 1905-07; director, 1907-15, and since 1915, president. During the period 1917-18, he was chairman of the Committee on Lectures and Entertainments in the Training Camps of the National War Work Council of the Y. M. C. A. and director of the

speaking division of the Committee on Public Information.

**BETHLEHEM BACH FESTIVAL.** See MUSIC, under *Festivals*.

**BETHLEN, COUNT STEPHEN** (1874- ). A Hungarian political leader born at Gernyeszeg. He first entered Parliament in 1901 as a Liberal, joined the party of Independence in 1905, and after the Hungarian soviets had been overthrown, headed the Party of National Unity, or of Christian Small Landowners and Citizens. In 1919 he led the organization of forces against Bela Kun and his Reds, in Vienna and Szeged, and on April 15, 1921, he became Premier. He was accused of using high-handed methods to obtain a majority in the elections which followed his dissolution of Parliament, but he passed a series of reform bills and was able to obtain the aid of the League of Nations in the financial reconstruction of the country, which gradually emerged from chaos. The elections of December, 1926, supported him, and by 1929 he had remained in office longer than any other European premier. See HUNGARY, under *History*.

**BETHMANN-HOLLWEG, THEOBALD VON** (1856-1921). A German statesman and Chancellor of the German Empire, 1909-17 (see VOL. III). As chancellor, Bethmann-Hollweg's place in domestic and foreign affairs was decidedly subordinate; his movements were continually being circumscribed by the caprices of his royal master and the intrigues of the military party led by von Tirpitz. He entertained the same ambitions for Germany's expansion as all Germans of the ruling class and regarded the violation of the Belgian Treaty and the declarations of war which followed it with complacency. He refused to accede to the unlimited submarine warfare inaugurated in 1917. His compromising and equivocal attitude satisfied neither his masters nor his critics. When the military command attempted in July, 1917, to interfere in affairs which he regarded as peculiarly his own, he handed in his resignation. He retired from public life to Hohenfinow, where, after preparing *Reflections on the World War* (1919), he died on Jan. 1, 1921. See GERMANY, under *History*.

**BETHUNE-BAKER, THE REV. JAMES FRANKLIN** (1861- ). An English theologian and Cambridge professor, who attended King Edward's School, Birmingham, and Pembroke College, Cambridge, where he won numerous honors in classical and theological subjects. He served as headmaster's assistant at King Edward's School, and as curate of St. George's, Edghaston (1888-90). Elected dean of Pembroke College in 1891, he remained until 1906. He was appointed Lady Margaret's professor of divinity at Cambridge in 1911, served as examining chaplain to the Bishop of Rochester (1905-14), and later held the same post under the Bishop of Birmingham. Besides editing *The Journal of Theological Studies* from 1903, he wrote: *The Influence of Christianity on War* (1888); *The Sternness of Christ's Teaching* (1889); *The Meaning of Homocousios in the Constantinopolitan Creed* (1901); *An Introduction to the Early History of Christian Doctrine* (1903); an essay on "The Ethical Significance of Christian Doctrines," in *Cambridge Theological Essays* (1905); *Nestorius and his Teaching* (1908) *The Faith of the Apostles' Creed* (1918); and *The Way of Modernism, and Other Essays* (1927).

**BETTELHEIM, ANTON** (1851- ). An Austrian author (see VOL. III). In 1917 he published *Leben und Wirken des Freiherrn Roch, von Liliencron, mit Beiträgen zur Geschichte der Allgemeinen Deutschen Biographie* (New Series, 1919, with Ludwig Angenruber). His more recent works are *Neue Gänge mit Ludwig Angenruber* (1919); *Marie von Ebner-Eschenbach-Werke und Vermächtniss* (1920); *Begas*, biography (1925), and *Karl Schönherr und das österreichische Volkstück* (1926). He also edited the letters of Angenruber, Louise von François, Conrad Ferdinand Meyer, and others.

**BETTS, LOUIS** (1873- ). An American portrait painter, born at Little Rock, Ark., who was the pupil of his father, E. D. Betts, Sr., of William Chase, and of the Art Institute (Chicago). He received the Cresson Traveling Fellowship from the Pennsylvania Academy of Design and went to Europe to familiarize himself with the work of Franz Hals and Velasquez. He attracted attention as a copyist. His portraits are painted with regard to emphasizing character above everything else, and he gains his effects without the use of accessories or non-essentials. He has painted portraits in Chicago, New York, London, Paris, Amsterdam, and Madrid, and his work is represented in the permanent collections of the National Arts Club, New York, and the Art Institute of Chicago. He is a member of the National Academy and of the National Institute of Arts and Letters.

**BEVERIDGE, ALBERT JEREMIAH** (1862-1927). An American author, public official, and lawyer (see VOL. III). As a result of his adherence to the Progressive Party, he lost his seat in the Senate, and he was the unsuccessful Progressive candidate for Governor of Indiana in 1914. By 1922, however, he had returned to his Republican allegiance and in that year he was the party's candidate for United States Senator, but was defeated by Samuel M. Ralston, Democrat. His last years were spent in writing, and it is said that his literary fame, based especially on his notable *Life of John Marshall* (four vols., 1916-1919), would outlive his reputation as a legislator and orator. *What Is Back of the War* (1915) was severely criticized as pro-German. His later books were *The Invisible Government* (1912); *The State and the Nation* (1924); *The Art of Public Speaking* (1924); and *Abraham Lincoln, 1809-1858*, published posthumously in two volumes in 1928. He also contributed to magazines. Senator Beveridge's biography of John Marshall, considered by historians and critics as a scholarly production, received the Roosevelt Medal in 1923 as "a valuable contribution to history." He received the degree of LL.D. from DePauw, Pennsylvania, and Brown universities and from Lafayette College.

**BEVERIDGE, SIR WILLIAM HENRY** (1879- ). An English lawyer and economist, born at Rangpur, Bengal, India. He attended Balliol College, Oxford, and from 1902 until 1909 was Stowell Civil Law Fellow of University College, Oxford. He wrote for the *Morning Post* (1906-08). On the Board of Trade, he was a director of labor exchanges (1909-16), and assistant secretary in charge of the employment department. Having been assistant general secretary to the Ministry of Munitions (1915-16), he served as second secretary in the Ministry of Food (1916-18), becoming permanent secre-

tary in 1919. In that year, he was made director of the London School of Economics and Political Science, and he was vice chancellor of London University (1926-28). He served on the Royal Commission on the coal industry in 1925. Besides contributing to several periodicals, he wrote: *Unemployment: A Problem of Industry* (1909); *John and Irene: An Anthology of Thoughts on Woman* (1912); *Swish, a submarine war game* (1916); *The Public Service in War and Peace* (1920); *Peace in Austria* (1920); *Insurance for All* (1924); and *British Food Control* (1928).

**BEWER, JULIUS AUGUST** (1877- ). A German professor of theology and philology, born at Ratingen, Germany, and educated at the Royal Gymnasium (Düsseldorf), Union Theological Seminary (New York), and the universities of Basel, Halle, and Berlin. He was professor of Old Testament language and literature at the Oberlin (Ohio) Theological Seminary (1902-04), and was ordained two years later in the Congregational ministry. Called to Union Theological Seminary in 1904 as assistant professor of Biblical philology, he was made professor in 1914. He became a member of the faculty of philology of Columbia University in 1913 and lecturer at Teachers College in 1912. He is the author of several critical essays on the Old and New Testaments.

**BEWLEY, LUTHER BOONE** (1876- ). An American educator in the Philippine Islands. He was born at Mosheim, Tenn., and educated at Maryville College. In 1902 he went to the Philippines as a teacher and held various positions until he was appointed superintendent of schools in Manila in 1914. He became director of education in the Philippine Islands in 1919.

**BEYERLEIN, FRANZ ADAM** (1871- ). A German novelist and playwright (see Vol. III). He is author of *O Deutschland, Heiliges Vaterland*, a novel (1915); *Der Philister*, essays (1919); and *Besuch*, four one-act plays (1919). Beyerlein has not duplicated the success of his first works, *Zapfenstreich* and *Jean oder Sedan*; but his old spirit is unchanged in works published since the end of the War: *Wetterleuchter im Herbst* (1922); *Sechs fröhliche Legenden* (1922); *Sant' Agata i Sabura* (1922); the trilogy *Fridericus rex* consisting of *Kronprinz und Deserteur* (1922), *Fridericus rex* (1923), and *Der Prozess des Müllers Arnold* (1924); *Die Siebenschläfer*, stories (1924); *Der Kürassier von Gulenell*, a novel (1925); *Kain und Abel*, a novel (1926); and the comedy *Frau Marquise* (1926).

**BLANCHI, bylin'kă, LEONARDO B.** (1852-1927). A distinguished Italian alienist who became Minister of Public Instruction for Italy. Born in San Bartolomeo, he received his M.D. from the University of Naples in 1871, became clinical professor of psychiatry and neuropathology there, and was for years director of the Provincial Asylum at Naples. His treatises on neurological subjects include *L'Emiplegia* (1886); *Scmeiotica delle Malattie del Sistema Nervoso* (1891), and *Malattie del Cervello* (undated). In 1905 appeared the *Trattato de Psichiatria* and in 1920, *La Meccanica del Cervello e la Funzione dei Lobi Frontali* was published. Both of these important works were translated into English.

**BIBESCO, bô-bês'kô, PRINCE ANTOINE** (1878- ). A Rumanian diplomat, the husband of Elizabeth Asquith, a writer and the daughter of the former British Premier. He was educated

in France, served as councillor to the Rumanian Legislations in London and Petrograd, and from 1920 to 1926 was Minister to the United States. In 1927 he became Minister to Spain.

**BIBLE SOCIETY, AMERICAN.** A society founded in 1816 which strives for a world circulation of the Bible to all people without denominational or racial discrimination. The Bibles are furnished at cost price and distributed at cost price through the society's home, foreign, and other agencies. The Scriptures issued by the society in 1927, totaled 8,642,485 volumes, as compared with 5,251,176 volumes in 1914. Of the total issue in 1927, home agencies distributed 3,762,811 volumes; foreign agencies, 4,879,674. In 1927 the Scriptures were supplied in 166 languages, including editions in Roman and Gothic characters, and embossed editions for the blind. The total issues of the society increased from 103,519,891 volumes in 1914 to 194,063,757 volumes in 1927, of which 108,132,107 had been distributed in the United States, and 85,931,650 in foreign lands. Workers in 10 home agencies in 1927 totaled 927, of whom 412 were volunteers; workers in 12 foreign agencies numbered 2542, of whom 676 were volunteers.

During the World War, from August, 1914, to the end of 1919, the Society distributed 6,808,301 copies of the Bible free of cost among the armed forces of the belligerent nations; of these 4,920,543 were given to men in the service of the United States, and 1,887,758 to those of other nations. The translation and revision of the Bible has been carried on continuously and recent activities include a translation of the entire Bible into Mandarin, which was finished in 1919; the Portuguese version completely revised in 1917; the reproduction of the Cherokee Scriptures, which was out of print, (1927). Progress was made in 1927 in the revision of the Gospels in Yiddish, and four Gospels in Hopi; in Africa, the Bible was published in Luba-Lulua; and progress was made toward completing the New Testament in Luragoli and Gospels in Olunyorre and in a revised Sheetswa New Testament; in the Far East, the Society shared in a new publication of a diglot Gospel of Matthew in Urdu and Arabic; while in Siam, the Bible was completed in Lao or Tai Yuan, and work was going on in Tai Lu, and in the Philippines, progress was reported on the revision of the New Testament in Tagalog and portions in Samaritano. The Society celebrated its centennial in 1916, at which time commemorative exercises were held by synods and conferences, and in churches, seminaries, etc., and public celebrations were arranged in Washington and some 14 other centres in the United States, and in such foreign capitals as Buenos Aires, Tokyo, Peking, Bangkok, and Cairo; also in Honolulu, Yokohama, and Seoul. At that time, the Society reported that during the century it had printed the Bible at the New York Bible House in 54 languages, and had aided in the translation or revision of the Scriptures into more than 80 languages, and through translation or circulation had provided the Scriptures in 150 of the more than 500 languages in which they are available. The official publication of the Society is the *Bible Society Record*, and its headquarters are at the Bible House, Astor Place, New York City.

**BIDDLE, ANTHONY J. DREXEL** (1874- ). An American author, born at Philadelphia and educated at Heidelberg, Germany. He lived in

the Madeira Islands for a number of years, and returned to the United States in 1891, when he took up editorial work. He was first on the staff of the Philadelphia *Public Ledger* and in 1895 became editor of the Philadelphia *Sunday Graphic*, which he revived. From 1895 to 1904 he was head of the publishing house of Drexel Biddle (New York, San Francisco, and Philadelphia), and founded the Drexel Biddle Bible Classes in the United States, the West Indies, Great Britain, and Canada. In 1918 he was in France as Marine Corps Captain of the Reserve Forces. He is the author of several novels, but his most important work is *The Madeira Islands* (1900), an account of the history, customs, inhabitants, etc., which has, however, been criticized as biased and exaggerated.

**BIDDLE, CHARLES J.** (1890- ). An American Ace, officially credited with the destruction of eight enemy airplanes during the War. He recently wrote *The Way of the Eagle*. He was trained in French aviation schools and was in active service, 1917-19. He won high honors including the Distinguished Service Cross, the French Legion of Honor, Croix de Guerre with four palms, and the Belgian Order of Leopold.

**BIER, AUGUST C. G.** (1861- ). A prominent German surgeon (see Vol. III) and professor of surgery in the University of Berlin. After the World War, he published many articles on his military experiences and upon the philosophy of medicine. His favorite subject was regeneration in the human body. In 1917 an edition appeared of *Chirurgische Operationslehre*, by Bier, Braun, and Kummel.

**BIERSTADT, EDWARD HALE** (1891- ). An American author and editor, born in New York City and educated at the Taft school at Watertown, Conn. He has held various editorial positions with publishing firms, including the Century Company, and was editor of the *Opera Magazine* (1914-15), the *Levant Review* (1923-24) and *Travel* (1925-27). In addition to frequent contributions to *The Bookman*, *New Republic*, etc., he is the author of *Dunsany, the Dramatist* (1917), *Aspects of Americanization* (1922), *Sounding Brass* (1922), and *Lost Trails of the Spanish Main* (1922). He edited *Three Plays of the Argentine* (1920), *Portmanteau Plays*, by Stuart Walker (1919), *More Portmanteau Plays* (1919), and *Celebrated Crimes*, by Barrow (1928).

**BIG BERTHAS.** See ARTILLERY.

**BIG FOUR.** See PEACE CONFERENCE AND TREATIES.

**BIGGERS, EARL DERR** (1884- ). An American author born at Warren, Ohio, and educated at Harvard. From 1908 to 1911, he was identified with the *Boston Traveler* as conductor of a humorous column and as dramatic critic. He wrote *If You're only Human* (1913); *Thieves*, with Grover Harrison, (1913); *Inside the Lines* (1915); *A Cure For Ourables*, with William Hodge, (1917), *See-saw* (1919), *The House Without a Key* (1925), *The Chinese Parrot* (1926), and the popular novel, *Seven Keys to Baldpate*, dramatized by George M. Cohan (1913).

**BIGGS, HERMANN MICHAEL** (1859-1923). An American physician (see Vol. III), distinguished as a clinician, pathologist, bacteriologist, and sanitary officer. In 1917 he was a member of the war relief commission of the Rockefeller Foundation, of the general medical

board of the Council of National Defense, and of the advisory committee of the United States Food Administration; and in 1920 he became medical director of the General League of Red Cross Societies, at Geneva, Switzerland. He was knighted by the King of Spain for his services to preventive medicine. New York University (1910) and the University of Rochester (1917) conferred the degree of LL.D. on Dr. Biggs, and in 1920 he received that of D. Sc. from Harvard University.

**BILLIARDS.** See SPORTS.

**BILLINGS, FRANK** (1854- ). An American physician (see Vol. III). Dr. Billings summed up his doctrines in a monograph *Focal Infection* (the Lane Medical Lectures) in 1916 and with Salisbury completed the reference work *General Medicine*, 15 vols. (1918). During the World War, he served in the American Expeditionary Force as chief provost marshal, attached to the office of Surgeon General. In 1924 he resigned as professor of medicine in Chicago University.

**BINET bē'nâ'- SCALE.** See MENTAL MEASUREMENT.

**BINET-VALMER, GUSTAVE** (1875- ). A French novelist whose writings include *La Passion* (1914); *Mémoires d'un engagé volontaire* (1918); *Le mendiant magnifique* (1919); *Antoine Jassart, veuf* (1921); *L'Enfant qui meurt* (1921); *Les seigneurs, les dames, et les petits messieurs* (1922); *Les jours sans gloire* (1922), and *Un grand français: Coligny* (1927).

**BINGHAM, HIRAM** (1875- ). United States Senator and explorer, born at Honolulu, T. H., and educated at Yale, the University of California, and Harvard. After a year as preceptor in history and politics at Princeton, he explored Bolívar's route across Venezuela and Colombia, (1906-07) and lectured on South American geography and history (1907-09). He was assistant professor (1909-15) and professor (1915-24) of Latin-American history at Yale. In 1908 he was delegate of the United States to the first Pan-American Scientific Congress at Santiago de Chile, and explored the Spanish trade route from Buenos Aires to Lima. He directed the Yale Peruvian Expedition in 1911, locating Vitcos, the last Inca capital, and making the first ascent of Mt. Coropuna (21,703 feet). He also directed Peruvian expeditions in 1912 and 1914-15 under the auspices of Yale University and the National Geographical Society. He was commissioned major in the Aviation Section of the Signal O. R. C. in 1917 and placed in charge of all the United States schools of military aeronautics. Later, as a lieutenant colonel of Air Service, he served as chief of the Air Personnel Division at Washington (1917-18). With the A. E. F. in France, he was commanding officer of the Allies' largest flying school at Issoudun (August-December, 1918). He was presidential elector (1916), lieutenant governor of Connecticut (1923-24) governor (1924-25) (resigned), and United States Senator (1925-27). He was reelected to the Senate for the term 1927-33. He is the author of *Journal of an Expedition Across Venezuela and Colombia* (1909); *Across South America* (1911); *Vitcos, the Last Inca Capital* (1912); *In the Wonderland of Peru* (1913); *An Explorer in the Air Service* (1920), and *Inca Land* (1922).

**BINGHAM, JOSEPH WALTER** (1878- ). An American professor of law, born at Indian-

apolis and educated at the University of Chicago. He was acting assistant professor of law at Cornell University, 1905-07, and at Stanford University, 1907-08, becoming professor in the latter institution, in 1912. In 1918 he was assistant director of the Bureau of War Trade Intelligence of the War Trade Board. He is author of *Cases on the Law of Water Rights* (1916) and articles in law journals.

**BINGHAM, WALTER VAN DYKE** (1880- ). An American psychologist, born at Swan Lake, Iowa. He was educated at the University of Chicago and the University of Berlin and taught at the University of Chicago; Teachers College, Columbia University; and Dartmouth College. As the head of the division of applied psychology of the Carnegie Institute of Technology (1915-24), he carried out a number of researches regarding the application of psychological theory to education and in business advertising. During the War, Professor Bingham served as executive secretary of the committee on the classification of personnel in the Army. Since 1924 he has been director of the Personnel Research Federation, Inc., and since 1926 president of the Psychological Corporation. He is joint author of *Procedures in Employment Psychology* (1926) and editor of the *Personnel Journal*.

**BINSWANGER, OTTO LUDWIG** (1852- ). A distinguished German neurologist born at Münsterlingen, Switzerland, who received his medical degree from the University of Königsberg in 1878, took up the study of neurology and psychiatry, and in 1882 was appointed professor in these branches in the University of Jena and director of the Grand Ducal Insane Asylum. In 1911 he became rector of the university. Binswanger is known chiefly for his exhaustive treatises on various nervous affections, *Die Pathologie und Therapie der Neurasthenie* (1896); *Die Epilepsie* (1899); and *Die Hysterie* (1904), translated into English as volumes of Nothnagel's *Special Pathology and Therapy*. In collaboration with Siemerling, he published his *Lehrbuch der Psychiatrie* (1907) and also edited the periodical *Epilepsia*, 1909-14.

**BINYON, Bin'yon, (ROBERT) LAURENCE** (1869- ). An English poet and art critic (see Vol. III). His plays *Sakuntala* (1920), *Arthur, a Tragedy* (1923), *The Young King* (1924) and *Boadicea* (1925) were produced. His later works include *The Winnowing Fan* (1916); *The Anvil* (1916); *The Cause* (1917); *The New World*, poems (1918); *The Four Years* (1919); *The Secret* (1920); *Court Painters of the Grand Mogul* (1921); *Drawings and Engravings of W. Blake* (1922); *Japanese Color-Prints*, with J. J. O'Brien Sexton (1923); *The Sirens, an Ode* (1924); *The Followers of William Blake* (1925); *Chinese Painters in English Collections* (1926); *Sophro the Wise* (1927); *Poems of Nizami* (1928), and *The Idols, an ode of the World War* (1928). He edited *The Letters of Maurice Hewlett* (1926).

**BIOCHEMISTRY.** This subject has been defined as the chemistry of physiology and hence is naturally subdivided into the chemical phenomena of the separate functions of living organisms, as digestion, respiration, metabolism, etc. Biochemistry, however, is a much more comprehensive subject, for it comprises the chemical composition of animal tissues, agricultural and plant chemistry, physico-chemistry of the body including electrochemical reactions, the

chemistry of foods, the chemistry of disease processes and products, the chemical aspect of therapeutics, etc., etc. Since most of these subdivisions are separately considered, the subject of biochemistry is regarded by some authorities as an artificial one. These authors retain the old name of physiological chemistry and narrow the scope to the dynamic chemistry of the animal functions, although these should be found intact in any good work on physiology. The chief use of the term "biochemistry" may be to call attention to certain subjects which do not receive proper attention in works on physiology and of these there are not a few. There is, for example, the subject of the animal syntheses, which originated almost a century ago when Wohler first formed urea from extra-animal sources. Akin to this laboratory activity is the isolation of definite chemical bodies from animal tissues. Both animal synthesis and isolation of active principles have been going ahead steadily up to the present time and, as a result, we have long series of products which comprise adrenalin, synthetic suprarenin, thyroxin, etc. Thus far, it well appears that in the narrower and technical sense, biochemistry really means laboratory analysis and synthesis which does not differ essentially from any other organic analysis and synthesis.

In recent years, there have been no radical advances under this head and the only subdivisions which are of major interest to the medical profession are SECRETIONS, INTERNAL, and VITAMINS, which the reader should consult. INSULIN receives a separate treatment and one may consult also the articles on the various deficiency diseases—GOITRE, PELLAGRA, RICKETS, and SCURVY. With these exceptions, the subject of biochemistry is discussed in the article on CHEMISTRY. Other articles in which biochemistry is actively involved comprise CANCER, DIABETES, DIET, and EPILEPSY. Attention may be called to the fact that while the condition (or conditions) comprised under the term "acidosis" tends to favor the development of many pathological states, the opposite condition of alkalosis—in which the alkaline index of the blood is elevated—appears to favor another but much smaller group of diseases which includes such mysterious maladies as cancer and epilepsy.

**BIOLOGY.** A term first applied by Lamarck in 1801 and Treviranus in 1802 to that study of living beings which differs in its point of view from either botany or zoology in that more attention is given to the fundamental laws of life and less to details of anatomy and classification. Obviously, this branch of science assumed especial importance after 1859 when the evolution hypothesis furnished an interpretation for the resemblances which appear between the structures and activities of all living beings. In more recent years, the term "biology" has been used with two distinct meanings. On the one hand, general biology deals with both plants and animals and uses representatives of either group according as one or the other better illustrates the principles under consideration; while, on the other hand, the distinction between plants and animals is retained and animal biology and plant biology are treated as distinct subjects, the word "biology" being here understood to mean a study of plants or animals, respectively, deriving from a comprehensive examination of the anatomy, embryology, ecology, paleontology, and classification of either group, conclusions as



to the fundamental principles underlying their structures, their activities, their relations to one another and their ancestral history.

As a result of intensive investigation along these anatomical, physiological, and other lines, each of these subdivisions of the subject has acquired the importance of a distinct science with its own technique and its own vocabulary. Moreover, it soon became evident that chemical and physical reactions certainly accompany and probably play an important part in all life processes, so that chemists and physicists have been called on to develop biochemistry and biophysics as aids to further analysis of vital processes. Hence, it follows that we have at the present time no such thing as a science of biology but rather a group of biological sciences all dealing with living matter and coöperating in the attempt to answer some fundamental biological problems: e.g.—What is the nature of living matter?—How may it have originated on the earth and to what extent is "life" a physical and chemical process?—How does living matter adjust itself to its environmental conditions?—If the present life of the earth has evolved from earlier life, what are the forces which have produced these modifications?—What are the laws according to which the peculiar characteristics of living beings are transmitted to their descendants? While for purposes of instruction it is common practice to group the most important of these conclusions into a summary called biology, these biological sciences really differ so much from one another that they are best treated under distinct heads as given below. See ANTHROPOLOGY; BOTANY; HEREDITY; ZOÖLOGY; EVOLUTION. For an excellent brief summary of the subject, consult *General Biology*, by Burlingame, Heath, Martin, and Pierce, or *Animal Biology*, by Haldane and Huxley (1927).

#### BIOMETRY. See HEREDITY.

**BIRGE, EDWARD ASAHEL** (1851– ). An American educator (see VOL. III). He was president of the University of Wisconsin (1918–25). Since 1925 he has been president emeritus. From 1897 to 1919, he was director of the Geological and Natural History Survey of Wisconsin and, from the latter date, president of the commission. He was one of the Conservation Commissioners, 1908–18, and in 1918 became president of the United Chapters of Phi Beta Kappa. He was the author of many books on zoölogy and limnology. Professor Birge's researches were mainly on the fauna of freshwater lakes and the biology of the floating forms.

**BIRKENHEAD, RT. HON. FREDERICK EDWIN SMITH, FIRST EARL OF** (1872– ). An English lawyer and statesman (see VOL. XXI), a member of the judicial committee of the Privy Council and High Steward of Oxford. In the early part of the World War, he served in France with the Indian corps, returning to England to become Solicitor General (1915), and then Attorney General (1915–17). In 1917, on America's entry into the War, he was head of a special mission to the United States. In 1919 he was created Baron and entered the House of Lords as Lord High Chancellor (1919–22). In that year, he was made first Earl of Birkenhead and received an Honorary D.C.L. at Oxford. In November, 1924, he reentered the government as Secretary of State for India, filling this post until October, 1928, when he resigned to enter

business as a director of Imperial Chemical Industries, Ltd. While in the government, he was valuable as a sane counsellor and brilliant debater. In September, 1928, while the Foreign Secretary was attending the League of Nations sessions in Geneva, Lord Birkenhead assumed his duties. He wrote *The Destruction of Merchant Ships* (1917); *My American Visit* (1918); *The Indian Corps in France* (1919); *Points of View* (1922); *Contemporary Personalities* (1924); *America Revisited* (1924); *Fourteen English Judges* (1926); *Famous Trials of History* (1926); *Law, Life and Letters* (1927); and *More Famous Trials* (1928.)

**BIRKHAUG, KONRAD ELIAS** (1892– ). An American physician born in Bergen, Norway. He received a degree in arts from Jamestown College, Jamestown, N. D., in 1917 and an M.D. from Johns Hopkins in 1924. During the next year, he was Charleton Fellow in medical research at Johns Hopkins and in 1925 he went to the University of Rochester, N. Y., as a teacher of bacteriology. He also became resident bacteriologist at the Strong Memorial Hospital. In 1925–26 he isolated the toxin of erysipelas and prepared an antitoxin therefrom which has been used at Bellevue Hospital, New York City, and other hospitals for the treatment of erysipelas with apparent good results, the mortality and hospital sojourn having been materially reduced.

**BIRMINGHAM.** The largest city of Alabama and one of the leading industrial cities of the South. The population increased from 132,685 in 1910 to 178,806 in 1920 and to 222,400 in 1928, by estimate of the Bureau of the Census. In 1924 a \$3,500,000 bond issue was voted by the city for public-school improvements and \$650,000 for the public library. Other developments include a new stadium costing \$500,000, a municipal auditorium costing \$750,000, and one of the finest municipal golf country clubs in the United States. A programme of grade-crossing elimination is being carried out in coöperation with the railroads. The number of manufacturing plants in Birmingham increased from 274 in 1914 to 565 in 1924; in 1928 more than 600 plants manufactured 2000 different articles, the value of which exceeded \$100,250,000. In 1925, according to the U. S. Census of Manufactures, 16,054 persons were employed in these industries and received \$18,120,000 in wages. Steel is the most important industry, because all the essentials for its manufacture are found in this district. The assessed valuation of property in Birmingham in 1928 was \$222,741,815; the net debt was \$15,615,007.

**BIRMINGHAM.** A city of England, the chief seat of metal manufactures in Great Britain, and the leading hardware centre of the world. The population at the census of 1921 was 910,444; in 1927 it was estimated to be 952,800. The municipal area is 46,087 acres (about 70 square miles). On account of the great boundaries extension, Birmingham has, after London and Glasgow, the largest population of any city in the United Kingdom. The corporation was the first to avail itself of the provisions of the Artisans' and Labourers' Dwellings Improvement Act of 1875, acquiring in 1876 about 45 acres with 1368 houses in an overcrowded and unhealthful section and transforming it completely. The capital expended on the improvement to Mar. 31, 1927, was £92,961, while the value of the municipal estate was estimated



at more than £3,000,000. The corporation has also town-planned practically all of its undeveloped area and has adopted a scheme of road widening under which all the main roads of the city will be ultimately 120 feet wide. In 1912 a large extension was added to the Council House so as to house the Museum and Art Gallery. The Art Gallery is especially rich in the works of Burne-Jones, who was a native of Birmingham, and of other artists of the Pre-Raphaelite School. The foundation stone of the Hall of Memory, the city's war memorial, was laid by the Prince of Wales in 1923, the building being completed in 1925. Four bronze figures, by Albert Toft, symbolize the services of the Navy, Army, Air Force, and Women's Auxiliaries. An additional reservoir of 500,000,000 gallons capacity has been constructed at Bartley so as to balance the variations in demand. The first municipal bank in England was established at Birmingham, first under the Municipal Savings Bank Act of 1916 and afterward by authority of a local act passed in 1919. At the end of the financial year on Mar. 31, 1928, there were 254,433 depositors. The bank, which combines the function of a savings bank and a housing department whereby advances can be made to depositors to purchase their homes, has been a success both as a means of encouraging thrift and as a sound example of municipal development.

**BIRMINGHAM**, GEORGE A. See HANNAY, JAMES OWEN.

**BIRNEY**, LAURESS J. (1871- ). A bishop of the Methodist Episcopal Church, born at Dennison, Ohio, and educated at Scio College and at the Boston University School of Theology. From 1895 until 1911, he was pastor of various Methodist churches in Ohio and Massachusetts. He was dean of the Boston University School of Theology from 1911 to 1920 and was elected bishop in the latter year.

**BIRRELL**, THE RT. HON. AUGUSTINE (1850- ). An English author and public official (see Vol. III). He was Secretary for Ireland from 1907 to 1916, and under his rule the Irish Universities Act, the Irish Land Act, and the Home Rule Act were passed by Parliament. At the outbreak of the government rebellion, Easter 1916, he resigned. Although active in politics for many years, Birrell is better known as a writer of essays and of biographies. He published *Frederick Locker-Lampson*, a biography, in 1920, and *More Obiter Dicta* in 1924.

**BIRTH CONTROL**. One of the circumstances that became apparent at the time of, and immediately after, the World War was an almost world-wide awakening of avowed public interest in the political, ethical, medical, and practical aspects of family limitation. This was probably due fundamentally to a realization that international competition tended to be intensified by population pressure. It was realized that the open spaces of the earth are now small and relatively unattractive, as compared with those into which the European stock had expanded during the nineteenth century. Moreover, the advancement in the complexity of social life with the resultant expansion of wants and especially the increasing freedom of women had brought into vigorous operation powerful social-psychological forces favoring the public discussion of birth control. A complete survey would show that there was no advanced country in Orient or Occident in which the subject has not

been agitated and generally discussed in recent years and especially since 1919.

**American Movement.** Active propaganda for birth control began in the United States with the publication in 1915 by Mrs. Margaret Sanger of a magazine, *The Woman Rebel*, in which the use of preventive methods was advocated. Her indictment under the Federal law forbidding the sending of "improper matter" through the mail, the repeated postponement of her trial, and the final quashing of the proceedings in February, 1916, gave wide publicity to the propaganda. The same may be said of the arrest and the sentence to thirty days in the workhouse of Mrs. Sanger and her sister for activities connected with a "birth control clinic" established in Brooklyn. The case was appealed and reached the Federal Supreme Court in October, 1919; it was dismissed on the ground of no jurisdiction. Interested persons by 1916 had formed the National Birth Control League; also a supporting Woman's Committee of One Hundred, headed by Mrs. Amos Pinchot, and the Committee of One Thousand, headed by Dr. Ira S. Wile. Birth Control Leagues were rapidly formed in more than a score of the larger cities during 1916 and 1917. Various other arrests in 1916 brought forward the issue of freedom of speech and press and led to the formation of the Free Speech League, headed by Leonard P. Abbott, interested in preserving the constitutional guarantees of liberty of expression. By the close of that year, the propaganda was well organized, country-wide, and well supported. Every activity of the promoters was considered by the press to have considerable news value and the more decided the opposition the greater the publicity. While the drama and the motion picture were used to aid the propaganda, the most effective means were public addresses, public debates, the publication of the *Birth Control Review* (first issue, February 1917), and the distribution of leaflets. Considerable support was given the movement by its indorsement in October, 1920, by the New York State Federation of Women's Clubs by a vote of 149 to 97. Many efforts to secure repeal of existing legislation, both State and Federal, proved ineffective.

In November, 1921, the American Birth Control League was formed in New York City, with Mrs. Margaret Sanger as president. The League organized the First American Birth Control Conference at New York, Nov. 11-18, 1921. One of the sessions was broken up by the police, as inquiry revealed, at the request of the office of the Roman Catholic Archbishop. The city council of Syracuse, New York, passed a resolution prohibiting the holding of the State Birth Control Conference there in February, 1924; the resolution was vetoed by the mayor after many elements in the community had been aroused over the free-speech issue. The League since that time has held notable conferences in various American cities. See **BIRTH CONTROL LEAGUE, AMERICAN**.

The Voluntary Parenthood League, with Mrs. Mary Ware Dennett as director and headquarters in New York City, was formed in 1919. It began the publication of *The Birth Control Herald* in 1923. Its objects are "1. To render available for the people's need, the best scientific knowledge as to how parenthood may be voluntary rather than accidental; and, as a first step the removal of the words 'pre-

vention of conception' from the Federal obscenity laws. 2. The education of parents."

In 1927 the Committee of Maternal Health of New York, which had begun to function in 1923, reported that 34 States had no express prohibition of birth control advice by physicians, while 11 States forbade expressly that physicians give such advice, and 4 other States which implied as much made the total 15. Of the 34 States; at least one, New York, permits physicians to give contraceptive advice. The Report of the Committee of Maternal Health of New York for 1928 gives a list of 28 Birth Control Clinics in the United States, as follows: California 4; Colorado, 1; Illinois (Chicago), 7; Maryland, 1; Michigan, 1; Minnesota, 1; New Jersey, 1; New York, 10; Ohio, 1; and Virginia, 1.

The warfare against the Birth Control Research Clinic which had been established in New York City was renewed Apr. 16, 1929, after 6 years of immunity. It was alleged that the animus was of the same origin as that of 1923. Coincidentally with this spectacular raid, which resulted in an acquittal for those arrested, Mrs. Dennett who had continued her activity in the movement was convicted for sending her sex primer through the mails in the U. S. District Court and was fined on April 29.

The entire subject of birth control is in such a state of flux that no adequate summary of the status can be ventured. As heretofore, much intellectual opinion seems to be on the side of the innovators, but powerful groups still are antagonistic. Thus, in 1928 the Parents' Exposition declined an exhibit in this field, although there was one at the Sesquicentennial Exposition in Philadelphia in 1926.

International. National organizations are found in England (founded in 1877), Holland (1885), Germany (1889), France (1895), Spain (1904), Belgium (1906), Switzerland (1908), Czechoslovakia or Bohemia, (1901), Portugal, Brazil (1905), Cuba (1907), Sweden (1911), Italy (1913), Algeria, Mexico (1918), and Japan (1921). These bodies constitute the Federation of Neo-Malthusian Leagues.

In Europe, increased activity and growing favor for propaganda were manifest in England, Germany, and Austria, but not in France. In England, widespread interest was aroused by the reports (see *Bibliography* below) of the first and second National Birth Rate Commissions organized by the National Council of Public Morals. These reports constitute a compendium of religious, social, medical, and biological opinion for and against. Religious opinion in England appears divided, though the Roman Catholics present the same opposition there as in the United States. Medical and scientific opinion, as also of social workers, is overwhelmingly favorable. Great publicity was secured by the propaganda of Dr. Marie Stopes and her husband, Dr. H. V. Roe, who established in March, 1921, the Mothers' Clinic. Two additional clinics in London were opened the following year.

In France during the World War, the censorship greatly interfered with birth control publications and such efforts as revived in 1919 were terminated by an act of July, 1920, which drastically and comprehensively prohibited every sort of propagation of knowledge of contraconception and abortion. The publication, transportation, and sale of literature is prohibited and public lectures forbidden. Violations, moreover, are to

be tried by the judges of the Tribunal Correctionnel instead of the juries of the Cours d'Assizes. This not only means secret proceedings and hence no propaganda value in the trials but places the guilty at the mercy of the judges. This legislation was undoubtedly a reaction of publicists, employers, and militarists to the after-war desire for population increase to insure national safety and prestige. It had the support of numerous economists and demographers and of various organizations, such as, *L'Alliance nationale pour l'accroissement de la population française*.

In Vienna, Austria, a clinic was opened in November, 1923, by Johann Ferch, with the support of the League Against Forced Motherhood. This began agitation for repeal of the law prohibiting abortion. Dr. Ferch says, *Birth Control Review*, July, 1924: "We propose that poor and sick women in the first three months of pregnancy shall have the right, for social and health reasons, to interrupt the pregnancy." The proposed law was defeated in December, 1923, by the combined opposition of clericals and national militarists.

Japan, China, and India all show increasing consciousness of overpopulation. Unchecked births and decreasing death rates compel a discussion of Neo-Malthusianism. In spite of official opposition, a birth-control group was formed at Tokyo in 1921 with Baroness Ishimoto as head. In 1922 official objection to Mrs. Sanger's visit was withdrawn on the understanding she would hold no public meetings. Nevertheless, the Japan Birth Control League began issue of a magazine in May, 1922. The first supporting organization in China was formed by the women of the National University in 1922. About the same time, organized propaganda began in India.

At the present day (1929), the situation may be summed up for Europe as follows: the movement is active and progressive in Great Britain, Holland, Denmark, the Teutonic countries, and Russia and the greatest antagonism is found in France, Belgium, and Italy; while in all other countries the movement is as yet undeveloped. See ABORTION.

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sion); *Premarital Instruction and Conjugal Adjustment*, in two parts, for the medical profession and public, respectively (before 1930); *Conjugal Experience and What It Teaches* (many case histories); *Topographical Atlas of Human Reproduction*; *Sterility*; *Clinical and Social Aspects*. For a rapid orientation on the status and literature of the past few years, see *Biennial Report of the Committee of Maternal Health of the N. Y. Academy of Medicine* (1928); and *Therapeutic Contraception*, by Hannah M. Stone (1928).

#### BIRTH CONTROL LEAGUE, AMERICAN.

A society organized Nov. 2, 1921, and incorporated under the laws of New York State, Apr. 5, 1922. The purpose of the League is to make birth control information generally available in the United States; in order that maternal and infant mortality, hereditary disease, and criminal abortion may be decreased; that prostitution, child labor, and housing congestion may be lessened; and that destitution and the resulting need for charity may be prevented. The programme of the League is: (a) To work for the amendment or repeal of those Federal and State laws which interfere with the prescription of contraception by physicians. (b) To acquaint physicians throughout the United States with the most approved methods of contraception. (c) To establish, in every centre of population, clinics where the poor may receive contraception advice from physicians. (d) To demonstrate to the public, by means of lectures, pamphlets and the *Birth Control Review*, the importance of birth control to the family, the community, and the race. In 1920 the League had 60,000 enrolled members and 1720 annual members. Its organization work had resulted in the establishment of four State leagues, and numerous branches in various States. During the four years that its Medical Director, Dr. J. F. Cooper, was in the field, from 1925 to 1929, he lectured on the technique of contraception to medical societies in every State, and enlisted the interest and support of hundreds of physicians. In 1925 the League organized the Sixth International Neo-Malthusian and Birth Control Conference, in New York, New Jersey, Illinois, California, Michigan, Ohio, Colorado, and Georgia. President, Mrs. F. Robertson Jones; vice presidents, Mrs. Lewis L. DeLafield, Mrs. Richard Billings, Mrs. Dexter Blagden; treasurer, Mrs. Warren Thorpe; secretary, Mrs. Robert S. Huse; medical director, Dr. James F. Cooper. Headquarters, 104 Fifth Avenue, New York City.

**BIRTH REGISTRATION.** See CHILD WELFARE, VITAL STATISTICS.

**BISCHOFF, DIEDRICH** (1866- ). A German author born at Bremen, formerly known under the pseudonym "Adam Ego." He has written prolifically on social ethics, freemasonry, insurance laws, and kindred subjects, and at the same time held the presidency of the leading insurance company of Leipzig. His works include *Die Soziale Frage und ihre Lösung* (1896); *Echte und Falsche Gerechtigkeit* (1899); *Der Soziale Grundgedanke der Freimaurerlehre* (1900); *Der Individualismus in der Freimaurerei* (1901); *Maurerium und Menschlichkeit* (1902); *Wesen und Ziele der Freimaurerei* (1912); *Freimaurerische Kriegsgedanken* (1914); *Vom Zukunftsberuf der Deutschen Freimaurer* (1915); *Religion und Freimaurerei* (1916); *Die Sozialisierung Unseres Wirtschaftslebens* (1918); *Sozialismus und Religion*

(1919); *Die Sozialisierung der Geister* (1919); *Freimaurerei und Deutschtum* (1920); and *Vom Vaterländischen Beruf der Deutschen Freimaurer* (1919). Among his later works are *Arbeit, Freiheit, Brüderlichkeit* (1920); *Die Religion der Freimaurer* (1920); *Pazifismus und Freimaurerei* (1922); *Menschlichkeit* (1923); *Heimat, eine Botschaft für ein neues Vaterland* (1924); *Vom Sinn der Arbeit* (1926), and *Christentum und Vaterland* (1926).

**BISHOP, FREDERIC LENDALL** (1874- ). An American physicist, born at St. Johnsbury, Vt., and educated at the Massachusetts Institute of Technology and the University of Chicago. In 1898 he became head of the department of physics in the Bradley Polytechnic Institute and remained there until 1909, when he was called to the chair of physics in the University of Pittsburgh, and also became dean of its engineering college and school of mines. His original investigations include studies on thermal conductivity and variations of wave length with pressure, surface tension, high temperature, and viscosity, on all of which he has published papers. Besides editing *Engineering Education*, he has served as secretary of the Society for the Promotion of Engineering Education and is a member of many scientific societies.

**BISHOP, JOSEPH BUCKLIN** (1847-1928). An American journalist and government official (see Vol. III). His later works were *A Chronicle of 150 Years* (1918); *Theodore Roosevelt and His Time, Shown in His Letters* (2 vols., 1920); *Life of Charles J. Bonaparte* (1922); *Life of A. Barton Hepburn* (1923); *Notes and Anecdotes of Many Years* (1925). He also edited *Theodore Roosevelt's Letters to His Children* (1919).

**BISHOP, LOUIS FAUGERES** (1854- ). An American physician, born in New Brunswick, N. J., and educated at Rutgers College and Columbia University. He became professor of diseases of the heart and circulation in Fordham University Medical School and physician to Lincoln Hospital. He made many contributions to periodical literature on diseases of the heart and blood vessels, blood pressure, etc. His works include *Heart Disease, Blood Pressure*, etc. (1909), translated into French the following year; *Arteriosclerosis* (1914), translated into French by Francon in 1921; *Heart Troubles: Their Prevention and Relief* (1920); and *A Key to the Electrocardiogram* (1923).

**BISSING, FERDINAND, BARON VON** (1844-1917). A German soldier who was Governor General (1914), and general-in-chief (1915), in Belgium during the World War. He died in Brussels. See BELGIUM, under *History*.

**BISSOLATI (BERGAMASCHI), LEONIDA** (1857-1920). An Italian Socialist statesman born at Cremona, the son of Bergamaschi, and adopted son of the philosopher Bissolati. In his weeklies, *La Critica sociale* and *La Lotte di Classe*, and the daily, *L'Avanti*, he became widely known as the leader of the Socialist element in Italy which remained faithful to the Government during the World War. He was elected to the Chamber in 1897, and continued a member until his death. Because he could not sympathize with the Socialists in their anti-patriotic sentiments, particularly in the Libyan War, Bissolati, with Bonomi, formed what was called the Reformed Socialist group. On the outbreak of the War, he enlisted, was wounded, and decorated for his valor. In June, 1916, after the

fall of the Salandra government, he was appointed Minister without portfolio and served under both Boselli and Orlando. At the Armistice, he resigned because of a disagreement over the Pact of London. Although he advocated the annexation of Fiume, he lost popular support because of his opposition to the annexation of Alto Adige and North Dalmatia.

**BISTOLFI, LEONARDO** (1859- ). An Italian sculptor, born in Turin. Recognized for an effective though not profound realism, Bistolfi has executed many public memorials, tablets, and medals, notably the "Offering" on the Victor Emmanuel monument at Rome. Examples of his work are to be found also in the United States and Japan. See SCULPTURE.

**BITTERBAUF, THEODOR** (1877-1928). A German historian, born at Nuremberg. He was professor at the universities of Erlangen and Munich, lecturer on history at the military academy of Munich, and writer of *Die Kurbairischen Polen im Siebenjährigen Kriege* (1901); *Geschichte des Rheinbundes* (1905); *Die Traditionen des Hochstiftes Freising* (1905-09); *Bayern als Königreich* (1906); *Die Deutschen Polen und die Entstehung des Krieges* (1915); *Napoleon I* (1916); *Friedrich der Grosse* (1916); *Geschichte der Französischen Revolution* (1921); and other historical works.

**BITTNER, JULIUS** (1874- ). An Austrian composer, born in Vienna. He studied there under J. Labor and B. Walter, but chose the law as his profession. In 1918 he was made a director of the Wiener Akademie der Tonkunst. He is known chiefly as an operatic composer, being his own librettist. His greatest success he won with *Das höllische Gold* (Dresden, 1916). His other operas, of unequal merit, are *Die rote Gret* (Frankfurt, 1907); *Der Musikant* (Vienna, 1910); *Der Bergsee* (Vienna, 1911); *Der Abenteuerer* (Cologne, 1912); *Die unsterbliche Kanzlei* (Vienna, 1918); *Die Kohlhämerin* (Vienna, 1921); *Das Rosengärtlein* (Mannheim, 1923; rewritten, Mayence, 1928). He has also written a symphony in F minor; a symphonic poem, *Waterland*; a cello sonata; two string quartets (A and E); piano pieces and songs.

**BITUMINOUS COAL.** See COAL.

**BITUMINOUS ROCKS.** See ASPHALT.

**BJERKNES.** See METEOROLOGY.

**BJORKMAN, EDWIN AUGUST** (1866- ). An American author, born at Stockholm, Sweden. When he was 25 years old he went to America and edited the *Minnesota Posten* at St. Paul (1892-94). His later work in journalism took him as a reporter, music critic, and editor to *The Times*, Minneapolis (1894-97), the *New York Sun* and *New York Times* (1897-1905), and the *New York Evening Post* (1906). Subsequently, he was a departmental editor of *The World's Work* and editor of the *Modern Drama Series* (1912-15). He represented the British Department of Information in Sweden (1915-17), directed the Scandinavian bureau of the Committee on Public Information (1918-19), and was associate director of the League of Nations News Bureau (1920-21). In 1926 he became the literary editor of the *Times*, Asheville, N. C. He wrote *Is There Anything New Under the Sun?* (1911); *Gleams—A Fragmentary Interpretation of Man and His World* (1912); *Voices of To-morrow* (1913); *Scandinavia and the War* (1914); *The Cry of the Ukraine* (1915); *The Soul of a Child* (1922); *Qatás of Life* (1923); and *The Search for Atlantis* (1927). In addition

he translated plays of Björnson, Bergstrom, Schnitzler, and others.

**BJORNSTAD, ALFRED WILLIAM** (1874- ). An American army officer, born in St. Paul, Minn., and educated at the University of Minnesota, which he left in 1896 to enter the army at the outbreak of the Spanish-American War. He was commissioned first lieutenant in the 13th Minnesota Infantry in 1898, Captain of Volunteers in the United States Infantry in 1899, and in 1901 first lieutenant in the Regular Army. He was promoted to the rank of major in 1917, to lieutenant colonel in the National Army in the same year, and in 1918 to brigadier general. From 1898 to 1904, he served in the Philippines. He was on duty with the General Staff in 1911-12 and served in various capacities with that body until 1917. He organized and directed, in that year, 16 training camps for training officers for the World War. He served as Chief of Staff for the 30th Division in 1917 and organized and directed the Army General Staff College in France, 1917-18. He was Chief of Staff for the 3d Army Corps in 1918 and was commander of the 13th Brigade in 1918-19. In this capacity, he took part in all the major engagements in France. After the War, he resumed duty at the General Staff College and in 1920 was appointed commander at Fort Snelling, Minn. Since 1925 he has been commander of the 7th Division. He received the Distinguished Service Cross and the Distinguished Service Medal and was decorated by the British and French governments.

**BLACK, HENRY CAMPBELL** (1860-1927). An American law author and editor, born at Ossining, N. Y., and educated at Trinity College. He was admitted to the bar in 1883 and practiced for several years at Williamsport, Pa., and St. Paul, Minn. In 1888 he removed to Washington, where he devoted himself to legal literature. He was editor of the *Constitutional Review*. Among his published books are *Constitutional Prohibitions* (1887); *Dictionary of Law* (1891-1910); *American Constitutional Law* (1895, 1897, 1919); *Income and Other Federal Taxes* (1917 and 1919); and *Relation of Executive Power to Legislation* (1919).

**BLACK, HUGH** (1868- ). A Scottish-American theologian (see VOL. III). He is the author of *The Open Door* (1914), *The New World* (1915), and *Lest We Forget* (1920).

**BLACK, WILLIAM MURRAY** (1855- ). An American army officer (see VOL. III). He was commissioned a brigadier general in 1916 and a major general in 1917. The latter year he was chairman of the Inland Transportation Committee of the Council of National Defense. He was a member of the United States Shipping Board in 1919 and retired from active service in the latter year. He was awarded the Distinguished Service Medal in 1918 for planning and administering the engineering and military railway service during the World War. In collaboration with Prof. E. B. Phelps, he invented a method of purifying sewage by aeration.

**BLACK-WART DISEASE OF POTATOES.** See PLANTS, DISEASES OF.

**BLACKWELDER, ELLIOT** (1880- ). An American geologist, born at Chicago, Ill., and educated at the University of Chicago. In 1902 he was given a fellowship at Chicago, where he also became an instructor in geology, but in 1905 he transferred to Wisconsin, where he remained until 1916, attaining full professorial rank in 1910. He was professor of geology and

head of the department in the University of Illinois, 1916-19, and in 1919 was visiting professor of geology at Leland Stanford Junior University, where in 1922 he became a full professor. From 1906 to 1918, he was also connected with the United States Geological Survey. He was a member of the California Petroleum Commission in 1917. He is the author of *Regional Geology of the United States* (1912).

**BLACKWELL, ALICE STONE** (1857- ). An American journalist (see VOL. III). She was editor-in-chief of the *Woman's Journal* (Boston) until 1917, when the *Woman's Journal*, the *Woman Voter*, and the *Headquarters News-Letter* were consolidated as the *Woman Citizen*. She became contributing editor to the latter. She was named as presidential elector for La Follette in 1924. She is the author of *The Little Grandmother of the Russian Revolution: Catharine Brshkovsky's Own Story* (1917).

**BLAINE, JOHN JAMES** (1875- ). A United States Senator, born in Grant County, Wis., who was graduated in law from Valparaiso (Ind.) University (1896). He began the practice of law at Boscobel, in his native county, was mayor of Boscobel three terms, member of the State Senate (1909-13), Attorney General of Wisconsin (1919-21), and Governor three terms (1921-26). He was then elected as a Republican to the United States Senate for the term 1927-33.

**BLAKE, EDGAR** (1869- ). A bishop of the Methodist Episcopal Church, born at Gorham, Me., and educated in the common schools and in the Boston University School of Theology. During 1895-1908, he was pastor in Methodist churches of Salem, Lebanon, and Manchester, N. H. Later, he served as assistant secretary and corresponding secretary of the Board of Sunday Schools of the Methodist Episcopal Church. He was elected bishop in 1920.

**BLAKE, JOSEPH AUGUSTUS** (1864- ). An American surgeon, born in San Francisco, and educated at Yale and Columbia Universities. He was professor of surgery in the College of Physicians and Surgeons, Columbia University, 1903-13, and has since been surgeon to several New York hospitals. At the outbreak of the World War, he had charge of the surgical ambulance at Neuilly, France, and in 1917 became head of the American Red Cross Military Hospital. In 1917 he was given the Cross of the Legion of Honor. He has written much on surgical subjects and in 1918 published his *Gunshot Fractures of the Extremities*.

**BLAKELOCK, RALPH ALBERT** (1847-1919). An American landscape painter, one of the foremost of the school (see VOL. III). During his long confinement as an insane person, his great paintings, from which he had been unable to eke a livelihood, brought record prices; "Moonlight," for example, was sold to the Toledo Art Museum for \$20,000. In 1916 he was released as sane and endeavored to resume his work as a painter, but without success. He was again confined in 1918 and died at the camp of a friend in the Adirondacks.

**BLAKESLEE, ALBERT FRANCOIS** (1874- ). An American botanist (see VOL. III). After 1915 he was resident investigator in plant genetics and after 1923 assistant director at the Carnegie Station for Experimental Evolution at Cold Spring Harbor, N. Y. He was a delegate of the Carnegie Institute to the Pan-American Scientific Congress at Lima, Peru, in 1924-25.

In 1929 he was elected a member of the National Academy of Sciences.

**BLAKESLEE, GEORGE HUBBARD** (1871- ). An American professor (see VOL. III). He is the editor of *Recent Developments in China; Latin America; Problems and Lessons of the War; Mexico and the Caribbean*; and edited the *Journal of International Relations* until 1921. He wrote *The Recent Foreign Policy of the United States* (1925). He organized the Clark University Conference on International Relations and in 1917-18 prepared reports on German colonies in the Pacific for the American Commission to Negotiate Peace. He was technical advisor to the American delegation at the Disarmament Conference in Washington, 1921. He was a leader of the discussions at the Institute of Politics, Williamstown, Mass., in 1922, 1923, 1925, and 1926. He lectured on Far Eastern history at Harvard, 1926, and gave the Schouler lectures at Johns Hopkins, 1927. In the latter year, he was visiting Carnegie Professor of international relations to universities in Japan, Australia, and New Zealand.

**BLAKEY, ROY GILLISPIE** (1880- ). An American economist, born at Shelbina, Mo., and educated at Drake, Missouri, Colorado, and Columbia universities. He began as a newspaper reporter and later became a university instructor and member of various economic commissions. In 1919 he was made professor of economics of the University of Minnesota. Among his works are *The United States Beet Sugar Industry and the Tariff* (1912), *National Tax Association Digest and Index* (1927), and the brochure, *The Comparative Costs of State Governments* (1916).

**BLANCHARD, ARTHUR HORACE** (1877- ). An American civil engineer, born at Providence, R. I., and educated at Brown and Columbia universities. He taught civil engineering at Brown University (1899-1911), and was professor of highway engineering at Columbia (1911-17) and professor of highway engineering and highway transport at the University of Michigan (1919-26). Meanwhile, he was consultant to various official organizations. During the World War, he was a member of the Council of Defense and served as vice chairman of the National Highway Commission. Besides being associated in the authorship of *Highways* (1910-12) and *Highway Engineering* (1913), he was editor-in-chief of the *American Highway Engineer's Pocketbook* (1919) and the *American Highway Transportation Handbook* (1920).

**BLAND, EDITH NESBIT** (Mrs. HUBERT) (1858-1924). An English poet and novelist (see VOL. III). She is the author of *Garden Poems* (1914), *Five Children and It* (1921), *The Incredible Honeymoon* (1921), *The Story of the Amulet* (1921), *The Enchanted Castle* (1922), *The Lark* (1922), and *Many Voices: Poems* (1922). New Editions of many of her earlier books were published.

**BLAND-SUTTON, SIR JOHN, FIRST BARONET** (1855- ). An eminent British surgeon, born at Enfield Highway. His writings, concerned chiefly with pathology and gynecological surgery, include *Introduction to General Pathology* (1880); *Ligaments, Their Nature and Morphology* (1887); *Evolution and Disease* (1890); *Surgical Diseases of the Ovaries and Fallopian Tubes* (1891), and *Tumors, Innocent and Malignant* (1893). The volume on tumors, his masterpiece, went through its seventh edition in 1922. He has also written *Gallstones and Dis-*



*eases of the Bile-ducts* (1907); *Fibroids of the Uterus* (1913), *Selected Lectures and Essays* (1920), and *Orations and Addresses* (1924). In collaboration with Giles, he wrote a textbook on *Diseases of Women* (1897), which has also seen its seventh edition. Knighted in 1912, he was made baronet in 1925.

**BLASCHKE, PAUL** (1850- ). A German lexicographer, born at Wigandstal and educated at the University of Leipzig. After employment in the postal service, he spent several years as a tutor and finally became a lexicographer. During the period 1878-1916, he published innumerable books on French, Italian, Portuguese, and Spanish grammar, German-English-French guides to conversations, a German-English-French and French-English-German electrotechnical dictionary (1913), a Polish grammar (1916), and a German-English-French medical dictionary (1916).

**BLASCO IBÁÑEZ**, bläs'kō ã-bä'nyath, VICENTE (1860-1928). A Spanish journalist, novelist, and politician (see Vol. III). Elected to the Cortes for six consecutive terms, his republicanism became so militant that he was on several occasions exiled. In 1909 he retired from politics, but in the years just prior to his death, he made a virulent attack upon King Alfonso with his book *Alfonso Exposed*. As a novelist, his form was influenced by the French realists and naturalists; but, until the World War, his subjects were generally Spanish. After the War, his books were more international in scope and were widely translated and read. They included *Mare Nostrum*; *La Tierra de Todos*; *Los Enemigos de la Mujer*; *El Paraíso de las Mujeres*; and *Cuatro Jinetes del Apocalipsis*, a penetrating study of the international and interracial problems of the War. He was a medalist in arts and letters of The Hispanic Society of America.

**BLASHFIELD, EDWIN HOWLAND** (1848- ). An American painter (see Vol. III). He was president of the National Institute of Arts and Letters in 1915-16 and was awarded its gold medal in painting for 1923. In 1920-26 he was president of the National Academy of Design.

**BLATCH, HARRIOT STANTON** (1850- ). An American lecturer and writer on feminism (see Vol. III). In 1917 she was head of the speakers' bureau of the Food Administration. She is the author of *Mobilizing Woman Power* (1918), *A Woman's Point of View* (1919), and *Elizabeth Cady Stanton as Revealed in Her Reminiscences, Letters, and Diary* (1921).

**BLEASE, COLEMAN LIVINGSTON** (1868- ). A United States Senator (see Vol. III). Ten years after resigning the Governorship of South Carolina, he was elected to the United States Senate for the term 1925-31. He presided over the State Democratic Convention in 1926.

**BLECH, LEO** (1871- ). An eminent German conductor and composer (see Vol. III). From 1913-23 he was general musical director of the Royal Opera (since 1919, Staatsoper) in Berlin. In 1923 he made an extensive tour of the United States as principal conductor of the Wagnerian Opera Company. After his return to Berlin, he was artistic director of the Deutsches Opernhaus and conductor at the Grosse Volksoper and in 1925 at the Volksoper in Vienna. In 1926 he returned to the Staatsoper in Berlin.

**BLEI, FRANZ** (1871- ). An Austrian writer, born at Vienna, and educated in politi-

cal economy at the universities of Vienna, Paris, Berne, and Zurich. After traveling in France, Italy, and America, he entered the literary field as playwright, but soon devoted himself to the essay. His principal works include *Oscar Wilde* (1904), *Noralis* (1904), *Von Amoureusen Frauen* (1906), *Felicien Rops* (1906), *Die Romantische Renaissance* (1906), *Landfahrer und Abenteuerer* (1913), *Die Puderquaste* (1913), *Menschliche Betrachtungen zur Politik* (1915), *Summa* (1918), *Retrung* (1920), *Der Knabe Gany-med* (1923), *Das Kuriositätenkabinett der Literatur* (1924), *Die Frivolität des Herrn von Disenberg* (1925), *Glanz und Elend berühmter Frauen* (1927), and *Das Erotische* (1927). Among his works translated into English is *Fascinating Women, Sacred and Profane* (1928). He also has translated numerous works of French authors, among them Marcel Schwob's *Monelle*, André Gide's *Le Roi Candau*, Maurice Barrès's *Du Sang, de la Volupté et de la Mort*, and others of Paul Claudel, Walt Whitman, and Oscar Wilde. He has also edited the works of Goethe, Reinhold Lenz, and some anthologies and magazines.

**BLEIBTREU, blīp'troi, CARL** (1859-1928). A German author and historian, born in Berlin (see Vol. III). He is said to have inaugurated the modern movement in German literature by his essay, *Die Revolution der Literatur* (1885). His contributions to war literature were *Englands Waterloo* (1916) and *Stegemanns Weltkrieg und die Marneschlacht* (1916). He also wrote *Geschichte der englischen Literatur* (1923), and *Geschichte des Weltkriegs* (1925).

**BLEININGER, ALBERT VICTOR** (1873- ). A German-American chemist, born at Polling, in Bavaria, and educated at Ohio State University, where he became instructor and, later, associate professor in ceramics. He was professor of ceramics at the University of Illinois, and head of the clay-products section of the United States Geological Survey and of the Bureau of Standards. In 1920 he turned to commercial chemistry. He is a member of various technical societies including the American Ceramic Society, of which he was president in 1918. Besides editing various journals, he has published the *Collected Works of H. A. Seger* (1903) and is the author of *The Manufacture of Hydraulic Cement* (1904).

**BLEULER, PAUL EUGEN** (1857- ). A Swiss psychiatrist, known especially for his original conceptions of psychology and insanity. He divided all mankind into schizoids and syntonics and renamed dementia praecox by calling it schizophrenia; that is, the highest pathological expression of the schizoid mind. Born at Zollikon, he received his medical degree from the University of Berne, and became professor of psychiatry, and after his retirement, honorary professor, in the University of Zürich. He wrote *Dementia Praecox oder Schizophrenia* (1911), translated into English by William A. White (1912); *Das Autistisch-undisziplinierte Denken in der Medizin* (1919); *Lehrbuch der Psychiatrie* (1920), translated into English by A. A. Brill (1924); and *Die Psychoide als Prinzip der organischen Entwicklung* (1925). He was editor of the *Jahrbuch für Psychoanalytische und Psychopathische Forschungen* during 1909-13. He was the first of Freud's contemporaries to speak favorably of psychoanalysis.

**BLICHFELDT, HANS FREDERIK** (1873- ). An American mathematician, born in Denmark. He came to the United States in 1888 and in



1894 entered Leland Stanford, Junior, University. He studied also at the University of Leipzig. He then returned to Stanford as instructor in mathematics and was made professor of that subject in 1913. Dr. Blichfeldt has made original studies of various subjects on continuous groups, linear homogeneous substitution groups, and the geometry of numbers, and has contributed papers on the results to the *American Journal of Mathematics* and especially to the transactions and bulletins of the American Mathematical Society, of which he was a vice president in 1912. His published papers are about 30 in number and include *Finite Groups of Linear Homogeneous Transformations*, published as Part Two of the *Theory and Application of Finite Group* (1916).

**BLINN, HOLBROOK** (1872-1928). An American actor and producer, born in San Francisco and educated at Stanford University. He appeared on the legitimate stage as a child, and later played in San Francisco before making his New York debut, in *The New South*, in 1893. Later, he appeared throughout the United States and in England. His successes included parts in *The Cat and the Cherub*, *The Battle of the Strong*, *The Duchess of Dantzic*, *The Clansman*, *Salome Jane*, *Salvation Nell*, *The Boss*, *The Famous Mrs. Fair*, *Getting Together*, and *The Bad Man*. In the last-named play, he had perhaps his best rôle, that of Pancho Lopez. In 1923-24 he worked with success in moving pictures. He starred in *The Dove*, 1925-26, and in *The Play's the Thing*, by Molnar, in 1927. At times, he was almost as active as a stage director as he was a player. He was the president of the Actors' Fidelity League.

**BLISS, ARTHUR** (1891- ). A British composer, born in London. He studied in Cambridge under Dr. Charles Wood and at the Royal College of Music under Sir Charles Stanford. In 1923 he settled in Santa Barbara, Calif. He is one of the extreme modernists, striving for unusual, bizarre effects, as in his *Color Symphony*, the four movements of which are entitled "Purple," "Red," "Blue," "Green"; or *Rout*, a vocal composition with ten instruments, the text being a succession of meaningless syllables; or a *Rhapsody*, where the tenor vocalizes on the syllable ah; etc.

**BLISS, GILBERT AMES** (1876- ). An American mathematician, born at Chicago, where he was educated at the university. As an instructor in mathematics, he taught at the University of Minnesota. He went to Göttingen for a year in 1902 and then returned to Chicago as an associate. In 1904 he was called to the University of Missouri and from there to Princeton, where he remained three years. Returning to Chicago in 1908 as associate professor, he continued in this capacity until 1913, when he attained full professorial rank. During the World War, he served as a scientific expert on range-firing sections in the United States Army. He has made special studies of differential equations, calculus of variations, and theory of functions of lines with an application to ballistics, on all of which he has contributed valuable papers to the *American Journal of Mathematics* and to the transactions and bulletins of the American Mathematical Society, of which he was president in 1921-22. Dr. Bliss was associate editor of the *Annals of Mathematics* in 1906-08 and of the transactions of the American Mathematical Society in 1908-16.

**BLISS, ROBERT WOODS** (1875- ). An American diplomat, born at St. Louis, Mo., who was graduated at Harvard (1900). From 1900 to 1903, he served in Porto Rico, first as secretary of the Territory and then as secretary to the Governor. He acted as secretary to American embassies and legations in Russia, Belgium, Argentina, France, Holland (1904-18), was chief of the Division of Western affairs at the Department of State, Washington (1920-21), and Third Assistant Secretary of State (1921-23). He was appointed Minister to Sweden in 1923 and Ambassador to Argentina in 1927.

**BLISS, TASKER HOWARD** (1853- ). An American soldier, born at Lewisburg, Pa. He was graduated from the United States Military Academy in 1875, was professor of military science at the Naval War College from 1885 to 1888, and spent two years as military attaché at Madrid. At the close of the Spanish-American War in which he had served during the Porto Rican campaign of 1898, he was appointed collector of customs at the Port of Havana and in 1902 was made special envoy to Cuba, to negotiate the treaty of reciprocity between Cuba and the United States. He was commandant of the Army War College in 1903. From 1905 to 1909, he held commands in the Philippines. In the early part of 1911, he commanded the provisional brigade on the southern California border during the Mexican insurrection, after which he was for a short time commander of the Western Department. He was placed in command of the Department of the East on Aug. 12, 1911, and became chief of staff of the United States Army, with the rank of general, on Oct. 6, 1917. Although he reached the legal age of retirement on December 31 of that year, he remained on active duty by order of President Wilson and was appointed to membership on the Supreme War Council in France. He was also a member of the American Commission to Negotiate Peace in Paris, 1918-19. He was detailed by the President as governor of the United States Soldiers' Home, 1920-27. He received the United States Distinguished Service Medal.

**BLISTER RUST.** See FORESTRY.

**BLOCH, ERNEST** (1880- ). A distinguished Swiss composer, born at Geneva. He received his musical education at the Conservatoire in Brussels and later at Hoch's Conservatory in Frankfurt. In 1909-10 he was conductor of the subscription concerts in Lausanne and, from 1911 to 1915, professor of composition at the Geneva Conservatory. In 1916 he came to New York, where he taught composition at the David Mannes Schools of Music. From 1920 to 1925, he was director of the Cleveland Institute of Music. Since 1925 he has been living in San Francisco as director of the local conservatory there. His music is rather harsh and austere; he draws his inspiration mainly from Jewish subjects and consciously attempts to give expression to the aspirations and ideals of the Jewish race. His works include an opera, *Maabeth* (Paris, 1910); three symphonies, in C sharp minor, in F (*Israel*), and *Symphonie Orientale*, on Hebrew themes; two symphonic poems, *River-Printemps* and *Vivre et Aimer*; *Trois Poèmes Juifs* for orchestra; *Poèmes d'Automne* for soprano and orchestra; *Schelomo* for 'cello and orchestra; Psalms 22, 114, and 137, for solo voices and orchestra; four string quartets; a violin sonata; and a viola sonata which won the Coolidge Prize at the Berkshire Cham-

ber Music Festival, 1919; a piano quintet (employing quarter tones); a suite for string orchestra and piano; 3 nocturnes for violin, cello and piano; a *Concerto grosso*, and *America*, an epic rhapsody, which won the \$3000 prize offered by *Musical America* in 1928. A second opera, *Jezabel*, begun in 1917, was still unfinished in 1929.

**BLOCH, JEAN-RICHARD** (1884- ). A French editor and author, born at Paris, who besides writing essays, short stories and novels, in 1910 founded the review *l'Effort*, which was later enlarged and entitled *l'Effort Libre*. His best known works were *Carnaval est mort*, a collection of articles whose general tenor was that there was no more art because there was no more faith; *Lévy; premier livre de contes* (1912); *Et c'.* (1918); *La nuit kurde* (1925); *Les chasses de Renaut* (1927), the last three being novels, and the play, *Le dernier empereur* (1928). Several of these stories give a sympathetic analysis of the Jewish character.

**BLOCK, ALEXANDER A.** (1880-1921). A Russian poet and playwright, born in Petrograd, and a leader of the Russian Modernist School. His poetry shows two distinct phases of development; during the earlier period, he seemed to live in a mystic land of unreality and dreams; later, he became vigorous, patriotic, hopeful. *Songs of the Beautiful Lady* (1905) belongs to the earlier phase, *Poems on Russia* (1915), to the later. His poetry is impressionistic and he employed the so-called new rhythm, similar to that of German and English. Besides the works mentioned, he wrote *The Unexpected Joy* (1907); *Snow-Mask* (1907); *Snow-Bound* (1908); *Night Watches* (1911); and *The Twelve* (1918). The last is his masterpiece, giving a powerful picture of Petrograd at the beginning of the Bolshevik Revolution. Although not a Communist, he was acclaimed by the Bolsheviks after the publication of *The Twelve*. He died from illness due to undernourishment under their régime.

**BLOCK, PAUL** (1862- ). A German editor and author, born at Memel. He studied at Memel and Königsberg and specialized in history and literature. In 1899 he became connected with the Berlin *Tageblatt*, and has been its Paris correspondent (1906-11), war correspondent, and literary editor. His works are the novels, *Der Grauböck* (1885), *Am Leuchtturm* (1886), *Anno Sturm* (1887), *Die Diamanten der Königin* (1888); the plays, *Der Rächer* (1888), *Rübezahl* (1888), *Rolands Knapen* (1888), *In der Tiefe* (1889), *Bergmanns Glück* (1889), *Gift* (1890); a volume of Parisian sketches (1911); *Der Verwandelte Bürger* (1919), dealing with the outbreak of the revolution in Germany; and numerous translations.

**BLOCKADE, ALLIED.** The measures taken during the World War by Great Britain, with the approval of the other Allies, and to some extent assisted by them, to prevent goods from reaching Germany which could assist the latter in prosecuting the War, did not constitute normal blockade of the German Coast in the earlier sense of the word. At first, it was less than a blockade as heretofore understood; by 1916 it had become the most drastic and effective control of neutral commerce ever attempted by belligerents. Submarine mines and submarine boats had made a close blockade of the old type absolutely impracticable. The blockade lines of cruisers were drawn across the English Channel

in the south and between the north of Scotland and the Norwegian Coast. At the outbreak of War, the Allies announced that they would follow the rules of the Declaration of London, of which Great Britain and the United States were not signatories, with some modifications. No notice of formal blockade was given then or later, but lists of articles declared to be contraband were published; these lists were subsequently extended. The results of these measures were very unsatisfactory.

In the cases of neutral countries whose land frontiers bordered Germany, interruption of traffic in goods originating in the neutral country or brought by land from some other neutral country was neither legal nor practicable. But in the case of goods imported by neutrals from overseas, the conditions were different. The doctrine of "continuous voyage" was amplified and extended. All such goods in excess of local neutral requirements were seized and condemned for purchase by the Allies or for confiscation. The restrictions imposed on this trade, especially in regard to insurance, censorship, cables, and the supply of coal and oil, forced the formation of merchantile associations in the neutral countries outside the Baltic, and these guaranteed the purely neutral destination of cargoes. When the United States entered the War, the source of supply of goods which could be passed on to the enemy via neutral territory was reduced to comparative unimportance, as control could be exercised at the place of export. The suppression of oversea trade designed to furnish supplies to Germany was then complete and was largely instrumental in forcing the enemy to sue for peace.

**BLOMFELD, blüm'fēld, SIR REGINALD** (1856- ). An English architect, born at Aldington, Kent. His style is late English Renaissance. Besides country houses, he designed many public buildings in London and elsewhere including the Goldsmiths' College, New Cross, the Imperial War Cross, Chelsea, and the new buildings for Lady Margaret Hall, Oxford. He also designed part of the façade of the Quadrant in Regent Street, London. He was made Associate of the Royal Academy in 1905 and served as professor of architecture there from 1906 to 1910. He was awarded the gold medal of the Royal Institute of British Architects in 1913 and, in the following year, was elected president of that body. After the World War, he was chosen principal architect of the Imperial War Graves Commission. His works include *The Formal Garden in England*, with F. I. Thomas (1892); *History of Renaissance Architecture in England* (1897); *The Mistress Art* (1908); *French Architecture*, successive volumes (1911 and 1921); and *The Touchstone of Architecture* (1925). He was knighted in 1919.

**BLONDIN, PIERRE EDOUARD** (1874- ). A Postmaster General of Canada, born at Saint François du Lac, Yamaska, and educated at the Séminaire de Nicolet, St. Michel's College, Toronto, and Laval University, Montreal. In 1908 and 1911 he was elected to the House of Commons for Champlain and in the latter year was Deputy Speaker. He was appointed member of the Privy Council and Minister of Inland Revenue in 1914; and was sworn in as Secretary of State, 1915, and as Postmaster General, 1917. Blondin resigned office in 1917 and was given command of the 158th Battalion of the Canadian Expeditionary Forces. He was a Con-

servative member of Parliament for the County of Champlain in 1917 and in the following year was called to the Senate.

**BLOOD PRESSURE.** Since about 1914, many diagnosticians have formed the opinion that the ordinary measurement, the systolic, is insufficient to give a correct idea of the true state of the blood pressure. They have therefore advocated that the diastolic and differential pressures be given more weight, the differential or pulse pressure being the true index of the circulation. While this attitude is sound in theory, it is so difficult to obtain satisfactory readings of the pulse pressure that some practical men have returned to dependence on the systolic pressure alone. The practical value of the systolic pressure is still held to be great, but this value is restricted to a very few diseases. In regard to the prevention and relief of high blood pressure, certain factors commonly accused have never been proved to cause or maintain this condition. Remarkable reduction of pressure has sometimes been obtained by the use of certain diets, as the so-called basic or alkaline diet, and also by the use of alkalies themselves.

It is possible that this subject may have receded somewhat in importance during the past few years and high medical authority has hazarded the opinion that blood pressure recording apparatus has done as much harm as good by making hypochondriacs out of healthy people. It has probably become increasingly possible to lower the blood pressure when high by the use of depressor substances and diet, but it is becoming more and more realized that the high tension is often conservative in nature and that it is not always nor altogether wise to lower it. There comes a time in the subject with permanent high tension when the pressure is lowered spontaneously and this is commonly regarded as a danger signal; so it is not altogether reassuring to bring about an artificial lowering. In the majority of cases high tension is a symptom of some disease and treatment has to be directed to the latter. In so-called essential high tension, where no cause can be found, it is best to depend on personal hygiene including change of occupation, a suitable diet, etc. and leave drastic measures to the cases in which the patient is threatened with death from hemorrhage, angina pectoris, and other serious and fatal complications.

**BLOOMFIELD, MAURICE (1855-1928).** An American philologist and Sanskrit scholar (see VOL. III). He was professor of Sanskrit and comparative philology at Johns Hopkins University from 1881 until his death. His early works dealt principally with the Vedas, their religion, mythology, and poetry. Among his later publications were *Rig-Veda Repetitions* (2 vols., 1916); *Life and Stories of the Jaina Saviour Pāravanātha*. He wrote on topics in Oriental literature for THE NEW INTERNATIONAL ENCYCLOPEDIA.

**BLOS, ANNA (1866- ).** A German social worker and teacher, born at Liegnitz. She has written on feminism and various social problems. Among her works are *Krieg und Schule* (1915) and *Frauenarbeit im Kriege* (1917). She is the wife of Wilhelm Blos, the author.

**BLUE, RUPERT (1867- ).** An American sanitarian and public official (see VOL. III). In 1915 he was elected president of the American Medical Association and of the Association of

Military Surgeons. In 1920-21 he was United States delegate to the International Office of Public Hygiene at Paris, and to the 3d Decennial Revision of International Nomenclature of Diseases. He was American delegate to the Opium Conference of the League of Nations at Geneva in 1923. From 1920 to 1923, he was in charge of the activities of the United States Public Health Service in Europe.

**BLUE, VICTOR (1865-1928).** An American naval officer (see VOL. III). In the World War, he commanded the United States battleship, *Texas*, in the North Sea, under Admiral Beatty of the British Navy. On Dec. 16, 1918, he was re-appointed chief of the Bureau of Navigation; an office he had filled 1913-16. He was made rear admiral on Apr. 1, 1919, and was retired on July 11, 1919. For his services in the World War, he received the Distinguished Service Medal and was decorated by King Albert of the Belgians with the Order of Leopold.

**BLUMENSCHNEIN, ERNEST L. (1874- ).** An American painter, born at Pittsburgh, who studied at the Art Students' League and the Académie Julian, Paris. He worked as an illustrator for American magazines during the years 1896-1908. Since 1908 he has been chiefly engaged in portrait work. He was awarded the Potter Palmer Gold Medal and \$1000 by the Chicago Art Institute in 1917, the Altman First Prize of \$1000 by the National Academy of Design in 1921, and the Ranger Purchase Prize by the National Academy in 1923. He was elected a member of the National Academy of Design in 1927.

**BLUNDEN, EDMUND CHARLES (1896- ).** A British author who was chiefly known for his poetry. He was educated at Christ's Hospital and Queen's College, Oxford, served at the front during the World War, and then became sub-editor of the *Athenaeum*. From 1924 to 1927, he was professor of English Literature at Tokyo University. In 1922 he published *The Shepherd*, a collection of poems, and in the same year was awarded the Hawthornden Prize. He wrote objective poems as a post-war reaction, later turning again to subjective writing. His volumes of poems include *The Waggoner* (1920); *To Nature* (1923); *Masks of Time* (1925); *English Poems, 1925*, and *English Poems, 1926*. His prose writings are *The Bonaventure* (1922); *Christ's Hospital: A Retrospect* (1923); *On the Poems of Henry Vaughan* (1927); and *Leigh Hunt's "Examiner" Examined* (1928). *Under-tones of War* (1928), in prose and verse, gave a masterly impression of war and its horrors. He edited *Madrigals and Chronicles*, by John Clare (1924); *A Song to David*, by C. Smart (1924); *Shelley and Keats: as they struck some Contemporaries* (1925); *The Actor*, by R. Lloyd (1926); and *Naydon's Autobiography* (1928).

**BLUNT, WILFRID SCAMEN (1840-1922).** An English author (see VOL. III). In 1914 he published his complete poetical works. He also published *My Diaries*, in two parts (1919 and 1920).

**BLYTHE, SAMUEL GEORGE (1868- ).** An American writer born at Genesee, N. Y., where he was educated at the State Normal School. In the period 1893-99, he did editorial work for the *Buffalo Express*, the *Buffalo Courier* and *Enquirer*, and the *Cosmopolitan Magazine*. For the next seven years, he was Washington correspondent for the *New York World*. He became a staff writer of the *Saturday Evening Post*

(Philadelphia) in 1907. Among his publications are *We Have With us To-night* (1909); *Cutting It Out* (1912); *The Old Game* (1914); *The Fakers* (1915); *Hunkins* (1919); *The Manikin Makers* (1921); *Keeping Fit at Fifty* (1923); *A Calm Review of a Calm Man* (1923); and *The Revolt of Peter Purdy* (1926).

**BOARDMAN, MABEL THORP.** An American Red Cross official, born at Cleveland, Ohio, and educated in private schools in Cleveland and New York, and in Europe. As a member of the central committee of the American Red Cross, she was a delegate from the United States to the International Red Cross Conferences at London (1907) and Washington (1912). For many years, she has been secretary of the American Red Cross. She is the author of *Under the Red Cross Flag*.

**BOAS, bō'ās, FRANZ** (1858- ). An American anthropologist (see VOL. III). He retained his professorship at Columbia University, but retired in 1919 from his position as philologist in the Bureau of American Ethnology. He is the author of *Primitive Art* (1927) and publications on North American anthropology.

**BOAS, ISMAR (ISIDOR)** (1858- ). A German physician and pioneer gastroenterologist, born at Exin in Posen, and educated at Halle. In 1886 he established at Berlin the first service for diseases of the stomach and intestines. In 1907 he became professor of gastroenterology in the University of Berlin. He wrote *Diagnostik und Therapie der Magenkrankheiten* (1890-93, English trans., 1907); *Diagnostik und Therapie der Darmkrankheiten* (1898, English trans., 1901); *Die Lehre von der Okkulten Blutungen* (1914); *Diatetik der Magen und Darmkrankheiten* (1920); *Das Hemorrhoidalleiden* (1922); and *Diagnostik und Therapie der Magenkrankheit* (1925). A monograph, *Habitual Constipation*, appeared in 1923 in a translation by Dr. T. L. Stedman.

**BOCKENHEIMER, PHILIPP** (1875- ). A German surgeon, born at Frankfort-on-Main. In 1907 he was made professor of surgery in the University of Berlin. In 1904-06, in collaboration with Frohse, he published the *Atlas Typischer Chirurgischen Operationen* and in 1907 he published the *Atlas Chirurgischer Krankheitsbilder*. Both received English translations. Other works were the *Leitfaden der Frakturen-Behandlung* (1909); *Plastische Operationen* (1912); and *Die Neue Chirurgie* (1921).

**BODANZKY, ARTUR** (1877- ). An Austrian conductor, born at Vienna. After graduation from the Vienna Konservatorium, he began his career in 1897 as violinist at the Hofoper and studied composition with A. von Zemlinsky. His first position as conductor was at the Stadttheater at Budweis, where he conducted only operettas. In 1901 he went to the Karltheater in Vienna and, two years later, became Mehler's assistant at the Hofoper. He then conducted one season at the Theater an der Wien (1904) and at the Lortzing Theater in Berlin (1905). In 1906-09 he was conductor at the Deutsches Landestheater in Prague and also conducted symphony concerts. There, his excellent work soon attracted attention, and in 1909 he was called to Mannheim as director and first conductor of the Grandducal Theater and conductor of the symphony and oratorio concerts. In 1914 he conducted the first performances of *Parsifal* at Covent Garden, where Gatti-Casazza was so impressed with his ability that he secured him

as Hertz's successor at the Metropolitan Opera House in New York. This position he filled with distinction after he began his American career with a masterly performance of *Götterdämmerung* (Nov. 17, 1915) until his resignation in 1929. Since 1916 he had also been conductor for the Society of the Friends of Music, which, under his direction, prospered and gradually expanded its activities to such an extent that Bodansky decided to abandon the field of opera altogether. From 1919 to 1921, he led the concerts of the National Symphony Orchestra with conspicuous success. After the amalgamation of the latter organization with the Philharmonic Society (1921), he directed several Philharmonic concerts as guest-conductor. He is a conductor of the Mahler type, authoritative, electrifying, and forceful. He revised the scores of Weber's *Oberon* and *Freischütz* and Beethoven's *Fidelio*, setting all the spoken dialogues to music. These new versions were brought out at the Metropolitan Opera House, under his direction, on Dec. 28, 1918, Mar. 22, 1924, and Jan. 22, 1927, respectively. He has made an excellent German translation of the libretto of Mozart's *Don Giovanni* (1911).

**BODE, bō'dē, WILHELM VON** (1845-1920). A German art critic and historian, born at Calverde in the province of Braunschweig (see VOL. III). After the revolution of 1918, he continued as director of the art gallery of the Kaiser Friedrich Museum and became a member of the Senate Academy of Arts and Art History. Among his later works translated into English were *Franz Hals, his Life and Works* (1914); *Sandro Botticelli* (1925); and *Florentine Sculptors of the Renaissance* (1928).

**BÖDEWADT, JACOB A. C.** (1883- ). A German author born in Tondern (formerly Schleswig, now Denmark). He has specialized on political and literary subjects concerned with the Low Germans and is the author of *Johannes Dose, der Erfolgreiche* (1905); *Gustav Frensen* (1906); *J. H. Fehrs* (1913); *Weltkrieg und Niederdeutschtum* (1915); *Timm Kröger* (1916); and some one-act plays in Plattdeutsch dialect. He edited *Holstenart* (1914); *J. H. Fehrs's Gesammelte Dichtungen* (1913); *Klaus Groth's Briefe über Hoch- und Niederdeutsch* (1914); *Timm Kröger's Gedenkbuch* (1920); and *Zwischen zwei Meeren* (1921); and an anthology, *Dichter der Nordmark* (1921). In 1922 he became editor of the magazine, *Nord-Schleswig*.

**BODLEY, JOHN EDWARD COURTENAY** (1853-1925). An English author (see VOL. III). His later works were *An Introduction to the English Edition of the National History of France* (1916) and *The Romanoc of the Battle-line in France* (1918).

**BOEHN, MAX VON** (1860- ). A German writer, born in Potsdam. He concerns himself with customs, fashions, and art. He is the author of *Spanische Reisebilder* (1905); *Menschen und Moden im Siebzehnten, Achtzehnten, und Neunzehnten Jahrhundert* (1906); biographies of Guido Reni, Giorgione, Palma Vecchio, Lorenzo Bernini, and Karl Spitzweg (1907-09); *Biedermeier* (1911); *Miniaturen und Silhouetten* (1916); *Bekleidungskunst und Moderne* (1917); *Vom Kaiserreich zur Republik* (1917); *Modenspiegel* (1919); *Rokoko, Frankreich im Achtzehnten Jahrhundert* (1919); *England im Achtzehnten Jahrhundert* (1920); and *Das Bühnenkostüm in Altertum, Mittelalter, und Neuzeit* (1921). His latest works are *Deutschland im*

*Achtzehnten Jahrhundert* (1922); *Spanien* (1924); *Empire* (1925); *Wallenstein* (1925); *Polizei und Mode* (1926); and *Italien* (1926).

**BOEX, HENRY and JUSTIN.** See ROSNY, J. H.  
**BOGARDUS, EMOBY STEPHEN** (1882- ). An American sociologist, born near Belvidere, Ill., and educated at Northwestern and Chicago universities. At the University of Southern California, he was assistant professor of sociology and economics (1911-13) and associate professor (1913-15), and in 1915 he became professor of sociology, and head of the department two years later. He became director of the Division of Social Work at the same institution in 1920 and was editor of the *Journal of Applied Sociology*, 1921-27, and of the *Journal of Sociology and Social Research* (1927- ). He closely identified himself with social work in southern California and has published several works on the subject, among them *Introduction to Sociology* (1917); *Essentials of Americanization* (1919, 1920); and a *History of Social Thought* (1922); *Fundamentals of Social Psychology* (1924); *The New Social Research* (1926); and *A City Boy and His Problems* (1926).

**BOGART, ERNEST LUDLOW** (1870- ). An American economist and writer, born at Yonkers, N. Y., and educated at Princeton and the University of Halle. He held assistant professorships at educational institutions, including Princeton. He became professor of economics at the University of Illinois in 1909 and head of the department in 1920. He had charge of commodity studies for the research bureau of the War Trade Board in 1918 and in the next year was regional economist in the Foreign Trade Adviser's Office for the Department of State. He was adviser on currency and banking to the Government of Persia, 1922-23. Among his works are *Economic History of the United States* (1907); *Practical Economics* (1910); *Readings in the Economic History of the United States* (1915); *Centennial History of Illinois* (1918); *Direct and Indirect Cost of the Great World War* (1919); *War Costs and Their Financing* (1921); *Economic History of Agriculture of the United States* (1923); *Internal Improvements in Ohio* (1924); and *Modern Industry* (1927).

**BOGERT, GEORGE GLEASON** (1884- ). An American lawyer and educator, born in Scotland, and educated at Cornell University. After studying law, he was admitted to the bar in 1908. For three years following, he practiced at Elmira, N. Y., and in 1911 was acting assistant professor of law at Cornell. He was assistant professor in 1912, professor of law and dean of the College of Law in 1921-25, and became professor of law in the University of Chicago in 1925. In 1920 he was commissioner on Uniform State Laws for New York. During the World War, he served in many important legal capacities. In 1919 he was appointed lieutenant colonel and judge advocate in the General Corps. He was author of *The Sale of Goods in New York* (1912); *The Elements of the Law of Trusts* (1914); *Handbook on Trusts* (1921); and *Conditional Sales* (1923). He was editor of the *Cornell Law Quarterly* in 1915-17 and 1919-23.

**BOGERT, LOTTA JEAN** (1888- ). An American chemist, born at Scotland, S. D., and educated at Cornell and Yale universities. She served as instructor at Simmons College during 1910-12 and at Mt. Holyoke during 1911-12. After further studies at Yale, she

held teaching appointments there until 1919. She was professor of food economy and nutrition at Kansas State Agricultural College, 1919-22, and research chemist of the obstetrical department, Henry Ford Hospital at Detroit, Mich., after 1922. Her original investigations have included studies in human nutrition, blood volume, excretion of calcium and magnesium phosphate, and an important research concerning pellagra.

**BOGERT, MARSTON TAYLOR** (1868- ). An American chemist (see VOL. III). During the World War, he was consultant of the Bureau of Mines and held a number of important posts in the chemical and gas service of the United States government. He has been consultant in research and development work to the Chemical Warfare Service since 1926. In 1927-28 he was first visiting Carnegie professor of international relations to Czechoslovakia.

**BOHEMIA, bô-hë-mi-ä.** See CZECHOSLOVAKIA.

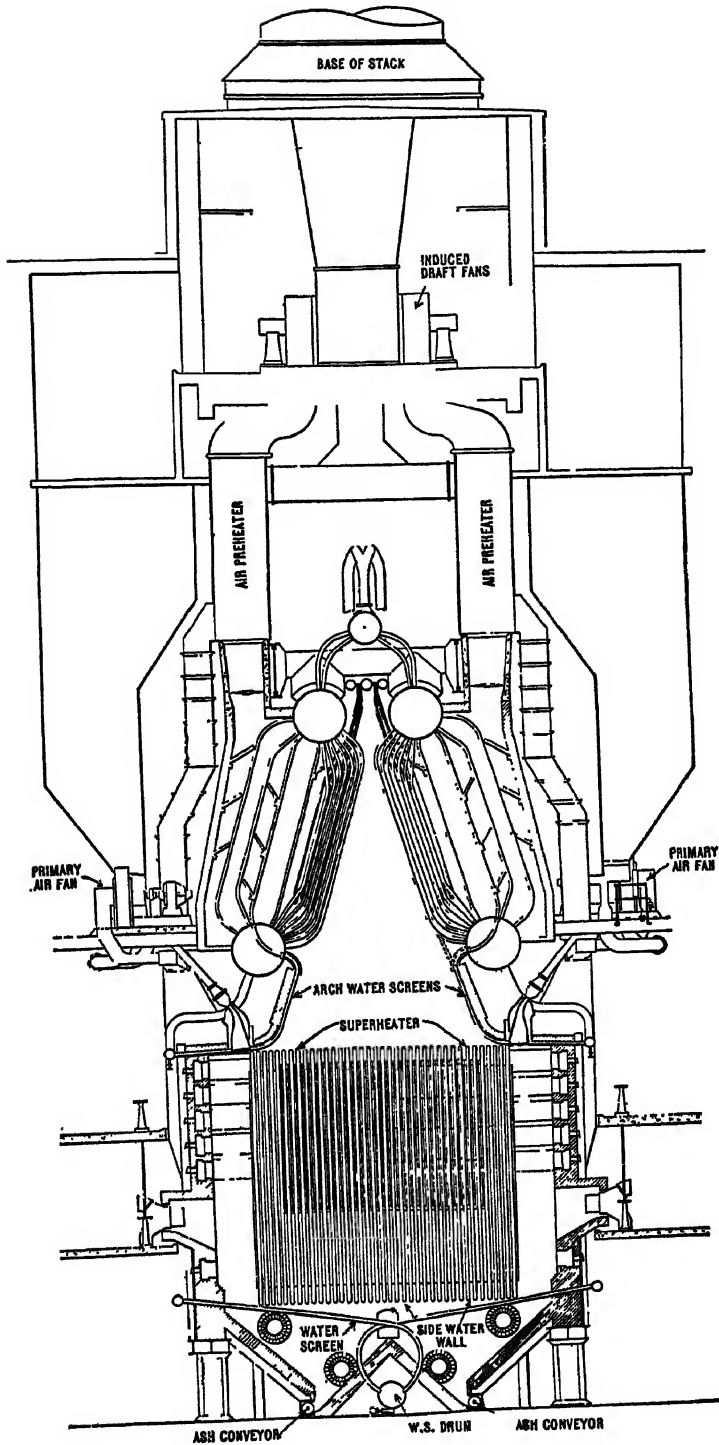
**BÖHLAU, bô'lou, HELENE** (1850- ). A German novelist (see VOL. III). Daughter of Hermann Böhlau, head of the old publishing firm of that name in Weimar, she was steeped in traditions of the Goethe period, which is the background of several later volumes: *Altweimarer Geschichten, neue Altweimarer Geschichten, Im frischen Wasser*, and *Frau Maria Stroms Garten* (1925).

**BOHM, MAX** (1868-1923). An American artist, born at Cleveland, Ohio, in 1868, and educated at the Cleveland Art School. At 19 he went to Europe, where he was the pupil of Jean Paul Laurens, Lefebvre, and Benjamin Constant. Two years after his first visit to Europe, he had a picture in the Paris Salon (1889). In 1898 he won prizes and the gold medal of the Paris Salon and, from that date, his list of awards has been exceptionally long. Among them is a gold medal from the Panama-Pacific Exposition 1915. Bohm was elected an Associate of the National Academy in 1917 and a full member in 1920. His best-known pictures are "The Family" and "Happy Hours" in the Luxembourg Museum. Bohm's work as a mural painter is well illustrated in the music room of Mrs. Mary Longyear's house in Brookline, Mass.

**BOHR, NIELS HENRIK DAVID** (1885- ). A Danish scientist, born at Copenhagen and educated at the university there. When but little over twenty, he decided to devote himself to the study of the atom. He became professor of mathematical physics at the University of Copenhagen in 1916 and director of its Institute of Theoretical Physics in 1920. In 1922 he won the Nobel Prize in physics for his theory in respect to the electric structure of the atom (see CHEMISTRY: *Electric Theory of the Atom*). In November of the following year, he delivered a series of six lectures at Yale University, describing his theory as to how atoms are built up by the binding of one electron after another in an atomic nucleus. This theory enabled other Danish scientists to discover a new element, hafnium. As a direct result of the Yale lectures, the Rockefeller International Education Board appropriated \$40,000 for the enlargement and extension of Dr. Bohr's laboratory at Copenhagen, in order that more students might work with him. His publications include *Abhandlungen über Atombau, 1913-1916* (German, trans. 1921); *The Theory of Spectra and Atomic Constitution* (1922); *On the Quantum Theory of*



## BOILERS

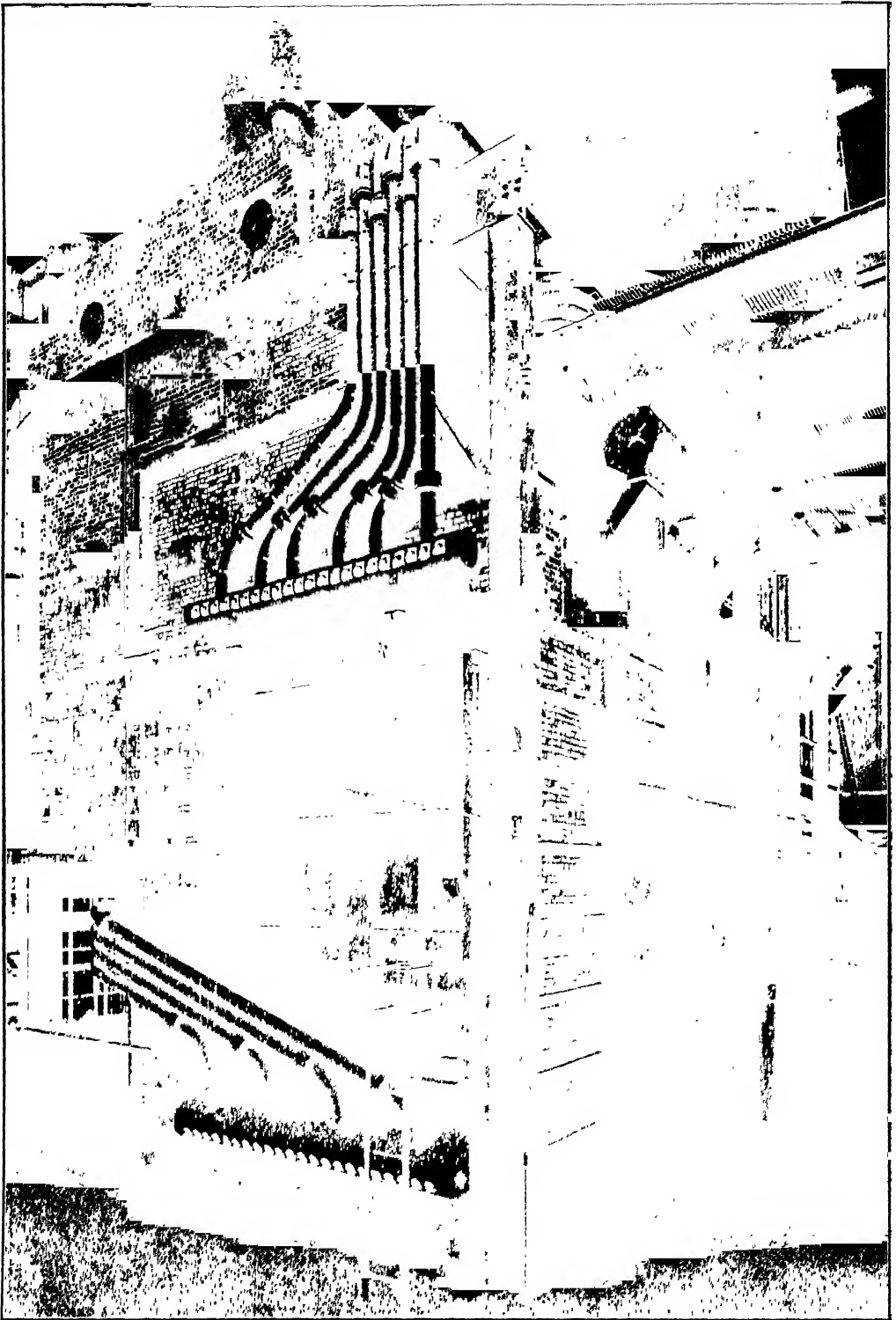


**CROSS-SECTION THROUGH ONE OF THE LARGE BOILERS AT THE FORDSON PLANT OF THE FORD MOTOR COMPANY**

This boiler, installed by the Combustion Engineering Corporation, has a capacity of over half a million pounds of steam per hour and is fired by both blast-furnace gas and pulverized coal.



## BOILERS



**A MODERN BOILER INSTALLATION**

**THIS BOILER IS LOCATED IN A LARGE MANUFACTURING PLANT EMPLOYING BOTH  
PULVERIZED COAL AND WOOD REFUSE AS FUEL**

*Line-spectra* (1922), and *On the Application of the Quantum Theory to Atomic Structure* (1924). Consult "Note on the Quantization of non-conditioned-periodic Systems," by M. S. Valarta in *Journal of Mathematics and Physics*, March, 1924, Boston, and *Das Atom und die Bohrsche Theorie seines Baues*, by H. A. Kramers and Heide Holst (1925). See PHYSICS.

**BOHR THEORY.** See CHEMISTRY.

**BOILER, MERCURY.** See BOILERS; QUICK-SILVER.

**BOILER CODE.** See BOILERS.

**BOILERS.** In the period since 1914, steam boiler practice has made marked strides as to capacities, steam pressures, rates of forcing, methods of firing, ash disposal, and sustained efficiencies. These factors have all influenced the general trend in design which has been toward large furnaces, partially or completely surrounded with water walls; relocation of superheaters and redistribution of heating surfaces with a smaller proportion in the boiler proper and a large proportion in the air preheaters, economizers, and superheaters.

Boilers are now in service in the United States which evaporate half a million pounds of water per hour and others in 1929 were building for two of the power plants in New York City that will be rated at 850,000 pounds of steam per hour.

Steam pressures in 1914 ranged around 275 to 300 pounds per square inch in the larger stations, whereas the end of 1928 found American practice ranging all the way up to 1800 pounds. See POWER PLANTS.

Boilers in the 1200- to 1400-pound class, as employed in the United States, differ from those of lower pressure principally in the size and thickness of the tubes and headers, and in the dimensions of the drums. The walls of the latter, in order to withstand the tremendous pressures, are from five to six inches thick. This thickness is too great to permit rolling the shell or to employ riveting; hence, the drums are forged out of solid ingots.

In Europe, where still higher pressures have been attempted, the designs are quite special. The Benson boiler, for instance, which operates at the critical pressure of 3200 pounds per square inch, has no drums but merely banks of small tubes. Two of these boilers are in service in Germany. The Atmos boiler, developed in Sweden, has rotating tubes by means of which high heat transfer is secured. An experimental boiler of this type ran at 1400 pounds and 840 degrees for a considerable period and a larger unit capable of generating 25,000 pounds of steam per hour was reported to be under construction in France. A quite different type of high-pressure boiler is that designed by Professor Loeffler of Charlottenburg in which highly superheated steam is produced in a coil surrounding the furnace. From this, the steam is pumped to coils in an insulated drum located outside the setting. Here, it bubbles up through the water in the drum and generates more steam. Another boiler employing the indirect heat transfer principle but differing in detail has been built from the designs of Schmidt & Hartmann. Sulzer Bros. in Switzerland have also built a boiler for 1600-pound pressure. All these European high-pressure boilers are of relatively small capacity compared with those that are in regular commercial operation in the United States.

High pressures and high rates of foreign boilers have made pure feed water a necessity. This has led to systematic control of feed water and to the increased use of evaporators. Steam temperatures in Europe have in some instances exceeded those employed in the United States where 750°F. has been about the upper limit for regular operation. For instance, the Langerbrugge Station in Belgium has operated successfully for several years at 850°F. The limiting factor in high steam temperature is the metal which has a tendency to creep over long periods of service under the combined effects of high pressure and high temperature. Much research work is now going on in connection with alloy steels with a view to overcoming this handicap. One central station in the United States is installing an experimental boiler and turbine to operate at 900°.

Sustained boiler efficiencies of over 85 per cent are now common and test efficiencies of over 90 per cent have been attained. The wide application of automatic combustion control has helped to maintain high efficiencies in everyday operation.

From 1921 to 1928, pulverized coal made remarkable progress, both as to refinement in the design of pulverizing equipment and the number of installations. It has proved a very strong competition of the stoker and as such has been responsible for bringing about striking improvements in stoker design. At present, practice as regards new installations is about divided between the two methods of firing.

Oil firing of steam boilers is now being confined largely to the marine field, a few favorably located central stations and industrial plants, and to heating boilers. Experiments have been made with pulverized coal for marine service and the U.S. Shipping Board steamship, *Mercer*, has made a considerable number of transatlantic voyages with pulverized coal-fired boilers. Although successful, development work is still going on and two other Shipping Board vessels are being fitted out with a somewhat modified system. Simultaneously with the *Mercer* experiments, two or three private shipping interests have been carrying on development work with pulverized coal. One outcome of the use of pulverized coal with stationary boilers has been the development, at the Charles R. Huntley Station in Buffalo, of the slagging furnace, in which the ash is maintained in a molten state and drawn off once a day. The hot slag is solidified and shattered by water sprays and sluiced to a dump. Hydraulic sluicing of ash is now very common with both stokers and pulverized coal.

Owing to the fact that the greater part of the ash with pulverized coal goes out of the stack in a finely divided state, many devices have been developed to catch this fly ash and thus prevent its becoming a nuisance to the neighborhood.

**Electric Boilers.** An interesting development where coal or oil fuel was costly and water power cheap and abundant, as in the northern United States and Canada, was the use of electric boilers, where electricity was employed to produce steam at the plant of the Laurentide Company of Canada, where in 1923, largest boilers of this type were in service. Each unit had a capacity of absorbing 35,000 kilowatts of electricity and producing 100,000 pounds of steam per hour. Another electric steam boiler installed at Berlin, New Hampshire, employed

3-phase, 60-cycle current at 22,000 volts, and had a capacity of 18,000 kilowatts generating steam at 135-pound pressure.

**National Boiler Code.** A committee of the American Society of Mechanical Engineers, appointed in 1911 to consider the subject of a comprehensive national code for the construction and installation of steam boilers, presented a preliminary draft of such a measure at the annual meeting of the society in 1914. This code was approved by the council of the Society in 1915, and straightway it was recommended as a basis for uniform State and municipal legislation. In preparing the draft, the Massachusetts and Ohio State regulations were adopted as a basis, and all interested manufacturers, users, and engineers were invited to make suggestions. The report and the accompanying code deal in detail with specifications for steam boilers and boiler tubes.

Uniform rules for safety valves, fire-tube and water-tube boilers, and steam- and hot-water-heating boilers combined practice with theory so that the interests of all were protected and the safety of the public was insured. The American Uniform Boiler Law Society was formed to further the adoption of this code which secured the approval of a number of States and the enactment into statutes. The code is now in effect in 20 States and a large number of cities.

**Mercury Boiler.** Some successful experiments by W. L. R. Emmet have culminated in the development of a mercury boiler and turbine. Inasmuch as mercury has a very much lower vapor pressure than steam (boiling at 677°F. and having a pressure of only 5 pounds at 900°F.), it is especially adapted to the binary cycle without involving high pressures. That is, if mercury vapor be generated at 35 pounds per square inch in a mercury boiler and passed through a mercury turbine and then condensed, the condenser temperature is sufficiently high to generate steam at 200-pound pressure. After a large number of experimental units had been built, Mr. Emmet finally designed and built in 1923 an 1800-kilowatt turbine and boiler to operate under these conditions at the Dutch Point Station of the Hartford Electric Light Company at Hartford, Conn. This unit operated for some time on commercial load as a supplement to the existing steam capacity of that station. Certain operating difficulties indicated the desirability of alterations in the boiler design and, as a result of this experience, a larger boiler of different design, and fired with pulverized coal, was built and installed in 1928 at the South Meadow Station of the same company. This later unit is of 10,000-kilowatt rated capacity.

The Hartford installations are the only mercury boilers that have been used for the production of power, although a considerable number of mercury boilers have been built for process work where the close temperature control with mercury makes it especially desirable.

Experiments have been made with other substances than mercury for the binary cycle. The Dow Chemical Company at Midland, Mich., has experimented with diphenyl oxide and other compounds have employed diphenyl. To date, none has reached the stage of strictly commercial application.

**BOJER,** hō'yēr, JONAN (1872- ). A Norwegian novelist (see Vol. III). His later works, most of which were translated into English, in-

clude *Sigurd Braa*, a drama (1916); *The Great Hunger* (1916); *The Face of the World* (1917); *God and Woman* (1920); *The Last Viking* (1922); *The Prisoner Who Sang* (1924); *The Emigrants* (1926), and *The New Temple*, a sequel to *The Great Hunger* (1927, trans. 1928). In 1923 he visited the United States. See SCANDINAVIAN LITERATURE, Norwegian.

**BOK,** EDWARD WILLIAM (1863- ). An American editor and author (see Vol. III). In 1919 he resigned from the editorship of *The Ladies' Home Journal*. He has written *Why I Believe in Poverty* (1915); *The Americanization of Edward Bok* (1920); *Two Persons; an Incident and an Epilogue* (1922); *A Man from Maine* (1923); *Twice Thirty* (1924); *Dollars Only* (1926); and *Perhaps I Am* (1928). He was the originator of the American Peace Award, a prize of \$100,000 offered in 1923 for the most practicable plan for securing permanent world peace.

**BOKHARA,** bo-kā'ra. Formerly a dependency of the Russian Empire with a crowned head, but since the Revolution, an independent republic (see below). It is situated in Central Asia, has an area of 79,440 square miles, and an estimated population of 3,000,000. Bokhara, the capital, has a population of 75,000; Karshi, 25,000. Its civilization is typically Asiatic, the Occidental life pressing all about it having touched it not at all. The activities of the people still indicate the pastoral and handicraft stages. Corn, fruit, silk, tobacco, cotton, and hemp are produced; goats, sheep, horses, and camels are bred. Green tea, to the amount of 1125 tons yearly, was imported from India, which, in turn, received almost all of Bokhara's raw silk.

In September, 1920, the reigning Amir, Mir Alim Khan, was deposed as the result of the return of the exiled Bokharan progressive intellectuals who received help in arms and troops from Soviet Russia. A Soviet government was set up. Towards the end of 1924, the Soviets of Bokhara, Khiva, and Turkestan agreed to redistribute their territories on a national basis; at the same time Bokhara and Khiva became Socialist republics. As a result of the redistribution completed in May, 1925, the new states of Uzbekistan, Turkmenistan, and Tajikistan and several autonomous regions were established. Thus, Bokhara as a separate state disappeared.

**BOLIVIA.** A South American republic, and the only country on the Western Hemisphere that has no direct access to the sea. It is situated west of Brazil and northeast of Chile. Its area is estimated at 787,000 square miles, certain territories still being in dispute; and its population is estimated at 2,599,000. La Paz, the largest city and the actual seat of government, had in 1928 a population of 142,549 as compared with about 70,000 in 1909. Other large and important cities are Cochabamba, 31,500; Potosi, 30,700; and Sucre, 30,200.

**Industry.** Although mining is the principal factor of economic wealth in the country, agriculture continues to be the leading occupation of the people. Of the agricultural products, rubber is the most important. The rubber industry is centred in the departments of Beni and Santa Cruz. Rubber, in fact, is second in importance only to tin. The crude rubber production of Bolivia is only slightly inferior to that of Brazil and many thousand acres of wild rubber trees are available. Bolivia is,

however, the second tin-producing country in the world, ranking after the Malay Straits Settlements. Besides this, Bolivia produces important quantities of wolfram, silver, lead, antimony, copper, and zinc. Considerable prospecting and some drilling for oil have been undertaken, particularly in the eastern part of the country, but no large production was reported. The value of the principal minerals in 1927 was: Tin, \$33,650,000; antimony, \$664,000; gold, \$4000; bismuth, \$255,000; and tungsten ore, \$10,000.

Commerce. In 1927, the total value of all exports was \$43,704,000, of which \$3,665,000 went to the United States. Minerals comprised 92.6 per cent of all the exports. The rubber exports consisted of 8,517,000 pounds valued at \$1,765,000. The total value of all imports was \$22,733,000, of which \$6,561,000 represented the share of the United States. Great Britain, Germany, and France were the next in importance as sources of origin for imports.

IMPORTS FOR CONSUMPTION AND DOMESTIC EXPORTS (Including Gold and Silver)

Yearly average or year	Thousands of dollars Imports	Exports
1901-1905	7,027	13,686
1906-1910	15,460	22,869
1911-1915	16,564	30,657
1916-1920	15,956	53,606
1921-1925	18,310	29,870
1921	16,880	15,943
1922	12,964	24,587
1923	20,031	34,288
1924	18,655	34,184
1925	23,022	40,947
1926	24,148	41,825
1927	22,734	43,704

The chief articles of import are manufactured articles, foodstuffs and beverages, and textiles. The United States is the chief country to gain by Germany's disappearance from the competitive market. However, Great Britain has also made rapid strides in obtaining the trade of Bolivia.

Communications. In 1926 the total length of railways in operation was 1244 miles including a new line, opened in July, 1917, from Oruro to Cochabamba. In addition, 230 miles were under construction. A line was begun on May 19, 1928, to tap the oil lands in the east. In 1921 a line from Atocha to Villazón was commenced and was completed in 1925. The importance of this road lies in the fact that it connects with the Argentine frontier and thus forms another means of transcontinental transportation, via La Paz.

Finance. The cost of government has steadily mounted, and large deficits were returned each year. The 1928 budget called for revenues of 51,897,187 bolivianos, and expenditures of 55,802,973 bolivianos, a deficit of 3,905,786 bolivianos. In 1912 revenues and expenses were almost equal at about 17,300,000 bolivianos. In 1922, the deficit was over 20,000,000 bolivianos. On Dec. 31, 1928, the foreign debt of Bolivia was reported as 175,826,000 bolivianos; internal debt, 14,724,769.98 bolivianos, and floating debt 3,297,353.49 bolivianos. This would make a total of 193,848,123.47 bolivianos. A refunding loan of \$24,000,000 was authorized in the United States in 1922, and a loan of 12,000,000 bolivianos was secured in 1923, to be applied to the deficit. In September, 1928, a loan of \$23,

000,000 was floated, the proceeds of which were to be used largely for refunding purposes.

Education. An increasing interest is being evinced in education in Bolivia. It is both free and obligatory. In 1926 there were 1598 elementary schools with 2765 teachers and 79,973 pupils; for secondary education there were 27 colleges (17 national), five church institutions, and five private schools with 403 teachers and 4213 students. At Sucre and La Paz are the only two universities which possess more than one faculty. There are several specialized technical schools. The best secondary institutions are those schools endowed by American Methodists at La Paz and Cochabamba.

History. General Ismael Montes was for the second time elected President of the Republic for the term 1913-17, to succeed President Villazón. During his administration, the effects of the War were felt in the decline of exports, though purchases by the United States lightened the stringency considerably. As a result of Germany's submarine campaign, Bolivia broke off diplomatic relations in April, 1917, and thus became one of the signatories of the Peace Treaty in 1919, as well as an original member of the League of Nations. For the term 1917-21, Sr. José Guerra was elected, but he was compelled to resign and leave the country in 1920, as the result of a revolution caused by his friendliness toward Chile. In January, 1921, Sr. Bautista Saavedra, leader of the revolution, was elected president by the National Assembly; he was recognized by the United States in February. At the end of Sr. Saavedra's four-year term, Sr. José Cabino Villanueva was elected President (May, 1925), and Sr. Abdon Saavedra, brother of the retiring President, was elected Vice President. The inauguration date was Aug. 6, but President Saavedra prevented the accession of the President-elect to office, and at his instigation Congress on September 1 nullified the election, on the grounds of fraud and ineligibility. Villanueva fled to Chile. President Saavedra, acting in accordance with the constitution, turned the office over to the president of the Senate, Dr. Felix Guzman, who was to continue as acting President until further elections could be held. Dr. Hernando Siles, a distinguished jurist, was elected and was inaugurated Jan. 10, 1926, for the period 1926-30.

Bolivia's continued efforts to gain an outlet to the sea, barred to her by the treaty of 1904 with Chile, were unavailing. The Peace Conference refused to consider the question, and in 1920 Bolivia appealed to Chile to reopen it, but met with no success. An appeal to the Assembly of the League of Nations in the same year was likewise fruitless. Bolivia then tried to have herself included in the Tacna-Arica conference between Peru and Chile which had been called by the United States, but her application to President Harding was refused. When the plebiscite plan to settle the Tacna-Arica question which had been decided upon by the United States as arbiter finally collapsed, Bolivia was left still landlocked. In 1924 Bolivia signed with Germany a convention renewing, with important modifications, the 1908 treaty of trade and commerce. For the most part, internal political conditions were quiet. In 1924 a revolt in the Province of Santa Cruz was put down without much difficulty. In 1927 a more serious uprising among the Indians of the departments of Potosi and Santa Cruz caused much concern,

but it also was suppressed. See TACNA-ARICA CONTROVERSY.

In December, 1928, Bolivia for a while occupied world attention by rushing to the very verge of war with Paraguay over a long-standing boundary dispute. Bolivia's boundary on the Argentine frontier had been fixed in 1913, on the Peruvian frontier in 1915, and on the Brazilian in 1920. But the Paraguay line had never been delimited because of a dispute over the ownership of a tract of about 100,000 square miles known as the Chaco Boreal. Through the good offices of Argentina, a joint commission met in Buenos Aires in April, 1927, to try to arrive at an agreement. No basis of accord was found, although discussion continued intermittently for more than a year and a half. On Dec. 8, 1928, a clash of the armed Bolivian and Paraguayan forces patrolling the border region occurred, and both countries excitedly made preparations for war. Diplomatic relations were broken off and mobilization began. Immediately, however, the nations of the world moved to prevent war. On December 11, the Council of the League of Nations cabled its conviction that the two nations should settle the matter peacefully, and followed this message up with others of like purport. But the actual averting of hostilities was undoubtedly due to the Pan-American Conference on Arbitration and Conciliation which was just beginning its sessions in Washington. The conference immediately appointed a special committee of five to act on the matter, and offered its good offices to both countries. On December 17 and 18, Paraguay and Bolivia, respectively, accepted this tender. The way was thus paved for negotiations under the auspices of the conference. These resulted in a protocol, signed by both countries, providing for a commission of nine to investigate the clash in the Chaco and fix responsibility for it. This commission was to report in six months. It was to be concerned exclusively with the December skirmish, the boundary dispute being left untouched.

**BOLL WEEVIL.** See COTTON; AGRICULTURE; ENTOMOLOGY, ECONOMIC.

**BOLLWORM.** See ENTOMOLOGY, ECONOMIC.

**BOLO, RAUE (PASHA)** (1871-1918). A French financial adventurer. By 1914, as a result of his shady financial operations, Bolo Pasha (a title gained from the Egyptian Khedive) was known in the demimonde of two continents. In 1917 he was arrested for treason, it being charged that he was in the hire of German agents, particularly that he had traveled in the United States, in 1915-16, in the interest of Count von Bernstorff, German ambassador at Washington. He was tried in February, 1918, and shot at Vincennes, Apr. 17, 1918. An attempt was made two years later to link Cailiaux's name with Bolo's.

**BÖLSCHÉ, WILHELM** (1861- ). A German writer on science, born in Cologne. He studied philology but specialized in nature and literature and has written on scientific subjects in a peculiarly fascinating style. He is the author of *Naturwissenschaftliche Grundlagen der Poesie* (1887), *Entwicklungsgeschichte der Natur* (1893-96), *Darwin* (1898), *Liebesleben in der Natur* (1898-1902), *Vom Bazillus zum Affenschen* (1899), *Itäkel* (1900), *Goethe* (1900), *Entwicklungslehre* (1900), *Hinter der Weltstadt* (1901), *Sonnen und Sonnenstübchen* (1902), *Die Erberung der Menschheit* (1903),

*Aus der Schneeegrube* (1904), *Die Abstammung der Menschheit* (1904), *Weltblick* (1904), *Naturgeheimniss* (1905), *Stammbaum der Tiere* (1905), *Sieg des Lebens* (1905), *Auf dem Menschenstern* (1909); *Stunden im All* (1909); *Was Ist die Natur* (1907), *Menschen der Vorzeit* (1909), *Komet und Weltuntergang* (1910), *Festland und Meere im Wechsel der Zeit* (1913), *Stirb und Werde* (1913), *Menschen der Zukunft* (1913), *Tierwanderung in der Urwelt* (1914), *Neue Welten* (1915), *Stammbaum der Menschheit* (1916), *Schutz und Trutzbündnisse in der Natur* (1917), *Eiszeit und Klimawechsel* (1919); etc. Bölsche also has written some fiction and has edited the works of Goethe, Hauff, Novalis, Uhland, Heine, and others. His latest works are *Aus Urtagen der Tierwelt* (1922), *Tierseele und Menschenseele* (1924), *Der singende Baum* (1924), *Die Abstammung der Kunst* (1926), *Im Bernsteinwald* (1927), *Von Drachen und Zauberkünsten* (1925), and *Lichtglaube* (1927).

**BOLSHEVISM.** Bolshevism as it developed in Russia and sought to extend its influence and teaching throughout the world, is merely an application of the well-known doctrine of Communism familiar to Europe since the publication of the *Communist Manifesto* in 1847. Its system includes these main precepts: the capture of the means of production and distribution by the proletariat, by force if necessary, and the continued dictatorship of society by this proletariat, even though it should constitute a minority. The word Bolshevism is derived from Bolshevik (Russian *Bolshevik*, plural *Bolsheviks*) the name applied to the members of the majority (Russian *bolshinstvo*) at the second Congress of the Russian Socialist Party in 1903, as opposed to the *Mensheviks* or minority. This antagonism between the two wings of Russian socialism, centring mainly in the rejection, by the Bolsheviks, of democratic control, was continued up to the Russian Revolution (1917) and after. It served largely, too, to divide European and American socialism into two camps, the first of which was ready to accept the Bolshevik doctrine of the dictatorship of the proletariat, and the second to repudiate it. Of the latter group may be mentioned the Englishman MacDonald, the German Kautsky, the Americans Berger and Hillquit. In the United States, after 1917, the term Bolshevism was applied loosely to almost all movements that aimed at radical change in the existing system of private ownership, whether the means advocated were peaceful or violent. For the history of Russian Bolshevism, see RUSSIA. See also COMMUNISM for other developments in theory and practice.

**BOLTON, GUY REGINALD** (1873- ). A dramatic author, born in England. His first play, *The Drone*, written in collaboration with Douglas J. Wood, was produced in New York in 1911. After 1911 he wrote many plays, mostly in collaboration. Those on which he worked with P. G. Wodehouse included *Have a Heart* (1917); *Leave It to Jane* (1917); *Miss 1917* (1917); *Oh! Boy* (1917); *The Riviera Girl* (1917); *Ringtime* (1917); *Ask Dad* (1918); *The Girl Behind the Gun* (1918); *See You Later* (1918); *The Rose of China* (1919); and *Sitting Pretty* (1924). With George Middleton, he wrote *Polly with a Past* (1917); *Adam and Eva* (1919); *The Light of the World* (1920); and *The Cave Girl* (1920). In association with other dramatists and composers, he wrote such musical



comedies as the *5 O'Clock Girl*, *Oh Kay!* and *Rosalie*, which were presented with success in New York.

**BOLTON, THADDEUS LINCOLN** (1865- ). An American psychologist, born at Sonora, Ill., and educated at Michigan and Clark universities. After teaching in secondary schools, he became successively professor at the University of Washington (1897-98), University of Nebraska (1899-1910), and University of Montana (1912-17). In 1917 he became professor of psychology at Temple University (Philadelphia), and in 1919, lecturer at the Philadelphia School of Occupational Therapy. His experimental researches include papers on rhythm, growth of memory, fatigue, motor power and intelligence, efficacy of consciousness, and inheritance of special traits.

**BOLTWOOD, BERTRAM BORDEN** (1870-1927). An American chemist, born at Amherst, Mass. He was graduated from the Sheffield Scientific School of Yale University in 1892 and continued there as a graduate student, taking the degree of Ph.D. in 1897. He carried on post-graduate studies at Munich, Leipzig, and Yale, and held the John Harling Fellowship of the University of Manchester, 1900-10. While engaged in research at Yale University and post-graduate work, he was also active as a teacher, serving as an assistant in analytical chemistry, 1894-96; instructor, 1896-1900; assistant professor of physics, 1906-10, and professor of radiochemistry from 1910 until his death. During 1918-22 he was acting professor of chemistry and director of the Kent chemical laboratory. His work in radio-chemistry, which included the discovery of the element ionium in the radioactive group, won for him election in the National Academy of Sciences. He was a frequent contributor to chemical journals, and translated: *Quantitative Analysis by Electrolysis*, by A. Clausen (1898); and *Physical Chemistry for Beginners*, by C. H. Van Deventer (1899).

**BOMB, AIRCRAFT.** See BOMBING OF VESSELS BY AIRCRAFT.

**BOMB, DEPTH.** A portable submarine mine carried by vessels in the Allies' anti-submarine service during the World War and by some others, for use against submarines which were submerged. The bombs were of two types: stick bombs, for projection by bomb-throwers, and plain cylindrical bombs for dropping or ejection from chutes. The bomb case was cylindrical, of sheet steel, and had a ring in each end for handling and securing. In stick bombs, the stick was secured in the cylinder like the handle of a hammer. In using either a single-barrel or a Y gun bomb-thrower, the stick of the bomb was inserted in the muzzle. The firing mechanism of the bomb could be set to cause explosion at any desired depth and the safety key was connected with the depth control. The charge was from 50 to 300 pounds of high explosive depending on the size of the bomb. When a destroyer or patrol boat passed over the supposed position of a submarine, bombs were slid overboard from the chutes astern or projected from the bomb-throwers, which could throw them about 40 yards. The depth bomb was the most important weapon used against submarines in the War, and according to British reports, it destroyed 34 of them. The explosion of a 300-pound depth bomb was always fatal at distances of 25 feet or less and even at more than 30 feet if the explosion took place below the plane of

the submarine and not too near the surface. At moderate distances beyond the fatal range, the violence of the explosion caused serious leaks and often put out of action much of the operating mechanism thereby forcing the boat to the surface or to the bottom, while the effect on the nerves of the crew was severe. Depth charges have been improved in details of construction and operation since the War. The improvements give greater safety in handling, greater range of effectiveness, and greater certainty of desired operation. Bombs with charges of 600 pounds of T.N.T. are now in service and give effective results in a radius of 100 feet. See BOMBING OF VESSELS; MINE, SUBMARINE; NAVIES OF THE WORLD; SUBMARINES AND THEIR WAR ACTIVITIES.

**BOMBING OF VESSELS BY AIRCRAFT.** The use of bombs by aircraft in the attack of vessels was, during the World War, chiefly directed against submarines. The bombs were small and of the type employed against troops, fortifications, arms factories, railways, and the like, in the attack of which numbers were usually more important than great size. Although large bombing planes and large bombs were developed during hostilities, their use was exceptional. Since the close of the War and particularly since 1920, the large bombing plane designed to attack naval vessels of the best protected and most powerful type has received much attention and is being steadily improved. The first extensive tests in the United States were made in July, 1921. The ex-German battleship, *Ostfriesland*, the cruiser, *Frankfurt*, the destroyer, *G-102*, and the submarine, *U-117*, were the vessels attacked. Both army and navy planes joined in the operations. The vessels withstood attack remarkably well. Bombs of 600 pounds and less which landed on the deck of the *Ostfriesland* produced local damage only. She was finally sunk by 2000-pound bombs which exploded under water close alongside.

Still more interesting tests were carried out in the summer of 1923. The old battleships, *New Jersey* and *Virginia*, were the targets. The ships were anchored. The weather was mild and so clear that approaching planes were visible 15 miles away. In fact, all conditions were abnormally in favor of the attacking force. The first attack was made on the *New Jersey* from a height of 11,000 feet by five airplanes, Martin bombers, each carrying four 600-pound bombs and one 100-pound sighting bomb. The planes moved in column, half a mile apart, in a large circle, and each dropped one bomb every time it passed over the target. Three hits were made, but the bombs exploded above decks and damaged only upper-deck plating and fittings. The next attack was made by seven bombers at a height of 6000 feet, with each plane carrying one 2000-pound bomb. No hits were made, but one bomb exploded close alongside. The ship took a slight list and it was thought she would sink; consequently, the next attack was made on the *Virginia* by seven bombers at 3000 feet, each carrying two 1100-pound bombs. One bomb struck the ship and breaking through one or more decks, exploded below with enormous effect; the masts, smokepipes, upper deck, and upper works were demolished. Thirty minutes later, the vessel turned over and sank. Four hours after the attack with 2000-pound bombs, as the *New Jersey* was still afloat with only a slight list and no serious injury to masts, turrets, guns,



or anything except light plating which was perforated and torn by the explosions and fragments of the 600-pound bombs, she was assailed by seven bombers, each carrying two 1100-pound bombs and flying at 3000 feet. No hits were made, though apparently one bomb fell near enough to increase the ship's list slightly. Two more bombers then appeared and dropped three 1100-pound bombs; one of these made a direct hit, and one fell close alongside. The bomb which hit broke its way through one or more decks and burst below, opening up the side or bottom plating so that the ship turned over and sank in five minutes.

If, in these tests, the vessels had been under way and steering zigzag courses at varying speeds, no hits would have been made except by accident. Had the upper decks been lightly armored, no explosions would have taken place below decks and the resulting injuries would have been no greater and perhaps less than the hit of a single 16-inch shell. Had the vessels been fitted with cellular anti-torpedo belts, the bombs which fell close alongside would have caused no serious damage except a slight reduction in speed. If in addition the vessels had been equipped with anti-aircraft batteries, smoke shells, and smoke-producing apparatus, and if they had been accompanied by an aircraft carrier with a squadron of combat planes designed for attacking bombers, then the attacking force would have been in much greater danger than the ships. In the present state of bomber development, the vessels which have most to fear from them are light cruisers and auxiliary vessels, especially fuel and supply ships and transports. These ought not to approach within 200 miles of a shore bomber station without adequate protection by aircraft, by swift patrol vessels carrying numerous anti-aircraft guns and other defensive apparatus, or by both.

Other bombing tests were conducted later in the United States and in several foreign countries. The results, so far as published, resemble those described in the foregoing paragraphs. In consequence of this, many battleships, battle cruisers, and other fighting ships are being fitted with armored upper decks. All naval vessels of the larger classes are now designed with special cellular protection against torpedoes and underwater bomb explosions and with smoke-screen appliances. Anti-aircraft guns of new and greatly improved types are carried by combatant naval vessels of all classes from battleships to submarines—and even by many auxiliaries. Bombing planes, for use against the enemy's vessels and naval bases, form a part of the airplane equipment of U. S. aircraft carriers. See BOMB, DEPTH; GUNNERY, NAVAL; ORDNANCE.

**BONATZ**, 'bôn-ätz', PAUL (1877- ). A German architect who was born in Munich and studied at the technical high school there. He was the architect of the university and library of Tübingen, the hospital of Strassburg, and the famous wine cellars of Henckell at Biberich.

**BONDFIELD**, MARGARET (GRACE (1873- ). A British Cabinet official and labor leader, born in Somerset. Assistant secretary of the Shop Assistants' Union from 1898 to 1908, she became known as a writer and lecturer for the Socialist and Labor movement. She was elected to the General Council of the Trades Union Congress, of which she was chairman in 1923, and served as delegate to labor and trades union conventions in Berne (1918), Paris (1918),

and Atlantic City, N. J. She was also a member of the British Trades Union Council delegation which visited Russia in 1920 and was adviser to international labor conventions held in Washington (1919) and in Geneva (1921, '22, '23, '26, and '27). Elected to Parliament from Northampton in 1923, she became Parliamentary Secretary to the Ministry of Labor in 1924. She was reelected by Wallsend in 1926 and retained her seat until named Minister of Labor in the Labor Cabinet formed June 7, 1929. She was also chief woman officer of the National Union of General and Municipal Workers.

**BONE**, MUIRHEAD (1876- ). A British painter and etcher, born at Glasgow. He established himself in London in 1891 and there quickly made a reputation by his etchings. He assisted prominently in founding the Society of Twelve and he was elected a member of the New English Art Club. The National Art Collections Fund in 1906 bought his etching, "The Great Gantry, Charing Cross," and presented it to the British Museum. He was appointed official artist on the Western front and with the fleet by the British War Office from 1916 to 1918, and some of his drawings were subsequently reproduced in volume form. Chalk line and wash are successfully used to give rhythm, form, and atmospheric effect; in others of these sketches, charcoal is the medium. Mr. Bone also did numerous individual portraits.

**BONE**, SCOTT CARDELL (1860- ). An American editor and governor, born in Shelby County, Ind., and educated in the public schools. He wrote for the Indianapolis newspapers and later identified himself with the Washington, D. C., *Post* for 17 years, first as news editor and later as managing editor. He owned and edited the Washington *Herald* (1906-11) and in 1911-18 he was editor-in-chief of the Seattle *Post-Intelligencer*. In 1914-15 he was chairman of the Alaska Bureau of the Seattle Chamber of Commerce, and served as Governor of Alaska (1921-25), having held in the interim several positions of a political nature.

**BONILLA Y SAN MARTIN**, bō'nēl-yū' é sán mār-tēn, ADOLFO (1875-1926). A Spanish humanist, juriconsult, philosopher, historian, and critic (see Vol. III). He was made dean of the faculty of philosophy and letters at the University of Madrid in 1922, a position he held until his death. In 1924 he made a lecture tour of the United States. He was a member of the Hispanic Society of America and held honorary degrees from several European universities.

**BONNARD**, PIERRE (1867- ). A French painter and lithographer, born at Paris, where he studied under Bouguereau and R. Fleury. He began his career with book illustrations and lithographs. Painting later in the manner of Manet, Cézanne, and Degas, he developed a symbolic, impressionistic style. His figure and landscape pictures are important for their excellent coloring. Bonnard belongs to the Salon d'Automne, and to the Salon des Indépendents.

**BONNEE**, CEBALDINE (1870- ). An American author (see Vol. III). Her later work includes *The Girl at Central* (1914); *The Black Eagle Mystery* (1916); *Treasure and Trouble Therewith* (1917); *Miss Matland, Private Secretary* (1919); *The Leading Lady* (1925); and *Taken at the Flood* (1927).

**BONNET**, JOSEPH (1884- ). A famous French organist, born at Bordeaux. Under his father's instruction, his progress was so rapid

that at the age of 14 he was appointed regular organist at St. Nicolas and, a little later, at St. Michel, where his recitals attracted attention. He then entered the Paris Conservatoire, where he studied with Guilment and carried off the first prize. In 1906 he won in competition the coveted post of St. Eustache, Paris; all competitors were first-prize winners of the Conservatoire. This position he has filled since then, but he has been allowed frequent leave of absence for extended concert tours all over Europe. In 1917 he made his first tour of the United States and met with such success that he has repeated his visit annually. He aroused special enthusiasm with his series of five historical recitals, as well as with his extraordinary improvisations. In 1922 he organized in Rochester, N. Y., after the model of that of the Paris Conservatoire, a fully equipped organ department at the Eastman Conservatory.

**BON'NEY, THOMAS GEORGE** (1833-1923). An English geologist (see Vol. III). Among his later publications are *The Present Relations of Science and Religion* (1913); the text to *Anderson's Volcanic Studies* (1917), and *Memories of a Long Life* (1922).

**BONSAL, STEPHEN** (1865- ). An American newspaper correspondent (see Vol. III). In 1914 he was Commissioner of Public Utilities in the Philippine Islands. He was sent on a special mission to Mexico in 1915 and was also with Hindenburg's army on the Eastern front in the same year. In 1916 he was advisor at the American-Mexican Conference. In the following year, he was commissioned major in the National Army and was on duty in the War College in Washington. He went to France with the American Expeditionary Force in 1918 and was American representative at the Congress of Oppressed Nationalities. He was attached to the American mission to the Peace Conference after the Armistice, and in 1919 was American member of the Inter-Allied mission to Austria-Hungary under General Smuts and of the special mission to Germany and Bohemia.

**BONSELS, WALDEMAR** (1881- ). A German writer of French and Flemish ancestry who was born in Holstein. From his seventeenth to his twenty-fifth year, he traveled, mostly on foot, in Europe, Asia, and Egypt, and after settling in Ambach on the Starnberger, began to write poems, stories, and essays of rare poetical feeling and symbolism. They are *Das Feuer* (1907); *Eros und die Evangelien* (1920); *Leben, ich grüsse Dich* (1921); *Das Anjehind* (1922); *Himmelstor* (1922); *Du Lichter Traum* (1922); *Menschenwege* (1922); *Kanonier Grimbart's Kriegsberichte* (1922); *Die Biene Maja und ihre Abenteuer* (1923), in English translation, *Maja the Bee; Mario, und die Tiere* (1927); *Indienfahrt*, in English, *An Indian Journey* (1928); the

plays *Die Flamme* (1925) and *Frühling* (1907); and two books directly called forth by the World War: *Wartalan*, also called *Die Toten des ewigen Krieges* (1922), and *Das junge Deutschland und der grosse Krieg* (1922), based upon the well-known correspondence between Gerhart Hauptmann and Romain Rolland.

**BOOTH, EVANGELINE CORY** (1865- ). A commander of the Salvation Army and daughter of William Booth, founder of the Salvation Army. She was born in England and educated in London, later commanding field operations of the Salvation Army in Great Britain, Canada, and the Klondike, and, since 1904, in the United States, with approximately 3000 officers and cadets and over 1200 corps and institutions under her. During the War, she did noteworthy work, for which the United States government awarded her the Distinguished Service Medal (1919). She is the author and composer of the words and music of many well-known Salvation Army songs.

**BOOTH, WILLIAM** (1856-1929). An English religious leader (see Vol. III), general of the Salvation Army (1912-1929). The High Council of the Salvation Army met near London in January, 1929, after he had been ill for eight months. He refused its suggestion that he retire and on January 16 the council deposed him by a vote of 55 to 8. He obtained an injunction preventing the council from electing his successor. This recourse to law lost him four of his supporters; and his petition to be allowed to remain as general but without his former right to choose his successor was again rejected by a vote of 52 to 5. E. J. Higgins, chief of staff, was elected the new general (Feb. 13, 1929). General Booth in May, 1929, was appointed by King George a member of the Order of Companions of Honor. He died June 16, 1929. He wrote many pamphlets on social and religious subjects and *Echoes and Memories* (1925) and *Glimpses Eastward* (1927). Consult *Painted Windows*, by Harold Begbie (1922).

**BOOTS AND SHOES.** In the production of boots and shoes, the United States continued to lead in both amount and value of output, followed by Great Britain and Germany. In addition to its own domestic consumption, there was a considerable export business, amounting in 1928 to 4,681,770 pairs valued at \$11,248,692. Naturally, the manufacture of boots and shoes was seriously interfered with by the World War and subsequent readjustment period as it affected production, price of leather, and the normal distribution. In 1927, however, according to the Bureau of the Census, boot and shoe manufacturing ranked seventeenth among the industries of the United States, with a product valued at \$944,714,463 though in the previous census of 1919, its value was \$1,155,041,000.

#### PRODUCTION OF BOOTS AND SHOES IN THE UNITED STATES

Kinds	1914 Pairs	1919 Pairs	1922 Pairs	1927 Pairs
Total boots and shoes	292,666,468	331,224,628	323,876,458	367,067,065
High and low cut (leather) (total)	285,642,260	291,540,408	280,366,192	320,135,038
Men's	98,031,144	95,017,356	89,984,085	93,012,560
Boys' and youths'	22,895,710	26,503,432	21,631,905	26,914,871
Women's	80,816,289	104,812,505	105,367,667	123,316,708
Misses' and children's	48,322,395	48,538,203	39,443,554	51,386,467
Infants'	16,476,763	16,668,912	23,989,001	24,101,295
Athletic and sporting (leather)	(a)	585,710	8,448,308	1,403,187
Canvas and other textiles	(a)	11,056,863	6,789,389	5,276,244
All other (slippers and miscellaneous footwear)	27,024,208	28,042,147	28,322,619	41,455,783

\* Not reported separately.

The Bureau of the Census reported that New England continued in 1928 as the leading centre of the boot and shoe industry, but New York had increased its output while Missouri and Illinois were becoming important producers. Massachusetts led with a production of 83,310,625 pairs, followed by New York with 72,800,041 pairs. Other States in their order were, Missouri with 46,060,389 pairs. Illinois with 25,246,250 pairs, New Hampshire with 21,490,486 pairs, Wisconsin with 17,058,63 pairs, Pennsylvania with 16,662,134 pairs, Ohio with 15,324,137 pairs, and all other States 27,318,679 pairs. According to the census of manufactures of 1925, when the total output of boots and shoes was valued at \$925,383,422, the following cities led in the industry with a production of leather footwear in excess of \$10,000,000: New York, St. Louis, Brockton, Milwaukee, Boston, Chicago, Lynn, Manchester, Rochester, Auburn, Cincinnati, Philadelphia, Columbus, and Marlboro.

The condition of the boot and shoe industry in the interval from 1914 is shown in the accompanying tabulation from statistics published by the Bureau of the Census. Whereas, in 1922 the total production of boots and shoes, exclusive of rubber footwear, was 238,876,458 pairs, or an increase of almost 11 per cent from 1914, the production in 1927 was 367,067,065 pairs, valued at \$931,523,722, marking an output record for the American industry.

AVERAGE WHOLESALE PRICE PER PAIR OF LEATHER BOOTS AND SHOES IN THE UNITED STATES

(From data published by the U. S. Department of Labor)

Year	Men's			Women's		
	Black calf Good-year welt blucher	Black calf Good-year welt bal	Black vici kid Good-year welt	Colored calf Oxford Good-year welt lace	Patent-leather pump, McKay sewn	
1913	\$3.11	\$3.16	\$2.86	(*)	\$1.37	
1914	3.17	3.28	2.98	(*)	1.45	
1915	3.25	3.35	3.10	(*)	1.50	
1916	3.71	3.88	3.50	(*)	1.90	
1917	4.75	5.14	5.06	(*)	2.75	
1918	5.62	5.31	5.44	(*)	2.93	
1919	7.60	7.10	7.24	(*)	4.07	
1920	8.95	7.50	8.33	(*)	4.86	
1921	7.00	4.80	6.39	\$5.21	4.00	
1922	6.50	4.61	5.83	4.00	3.60	
1923	6.43	4.85	6.00	4.13	3.60	
1924	6.25	4.88	6.00	4.12	3.58	
1925	6.39	5.13	6.00	4.15	3.60	
1926	6.40	4.92	6.00	4.15	3.60	
1927	6.43	4.93	6.08	4.20	3.68	
1928	...	5.00	6.42	4.33	3.83	

\* Data not available.

The principal types of shoes manufactured in the United States may be divided as follows: Goodyear welted, McKay sewn, screw or metallic fastened, stitched down, and turned. In 1927, 33.6 per cent of the shoes manufactured were of the Goodyear type, 30.6 per cent were

McKay sewn, 14.2 per cent were turned, and 7.8 per cent were wood or metal fastened, and 12 per cent stitched down. In the United States the prices for shoes increased from 1913, during the War reaching a peak in 1920.

From that time, there was a recession tending toward more suitable prices but not reaching those prevailing before the War. In the American shoe industry, there was a tendency toward consolidation and larger factories, so that the number of establishments continued to decrease.

Also, the industry suffers from the variations due to fashion, some of which may be of long life and lead to considerable margin of profit by the retailer on sales actually made, while others are but temporary in their vogue. There has been a tendency to decrease the number of styles and to standardize the production, but it is realized that fashion plays an important part in the industry as in the case of the vogue of low shoes in preference to those higher cut, and various temporary fashions.

In addition, the shoe industry has suffered due to the increased use of motor cars and taxicabs, and it has been stated that the average life of a pair of shoes is 25 per cent more than before the motor car was so universally used in the rural districts, and in urban communities such means of transportation as motor busses and taxicabs had developed.

In 1928 the exports of shoes from the United States were as follows:

EXPORTS OF SHOES IN 1928

Men's and Boys'	1,870,493 pairs, valued at \$5,796,517
Women's	1,783,342 " " " 4,309,877
Children's	666,435 " " " 750,199
Slippers	361,600 " " " 392,099

In 1928 there were imported into the United States 2,616,884 pairs of all-leather boots and shoes, valued at \$8,254,224; 633,998 pairs of slippers valued at \$1,019,435; and 1,170,933 pairs of other footwear valued at \$316,193. This was a substantial increase from 1921, when imports of boots, shoes, and slippers totaled but \$573,000. The increasing imports led in 1929 to demands by American manufacturers that shoes be removed from the free list and made dutiable.

The accompanying table will show the extent of the boot and shoe export trade of the United States which developed extraordinarily in the years immediately following the War when the European markets were larger consumers of American shoes. Ordinarily, Cuba, Canada, Mexico, Jamaica, Panama, the Dominican Republic, Newfoundland and Labrador and the United Kingdom are the most important export markets for the United States, though Australia, British South Africa and some South American, Asiatic and European countries take a quota. See also LEATHER.

LEATHER BOOT, SHOE, AND SLIPPER EXPORT TRADE OF THE UNITED STATES

Division of Statistics, Bureau of Foreign and Domestic Commerce. Figures for 1913 are for fiscal year; all others are for calendar years

Year	Total pairs	Men's shoes pairs	Women's shoes pairs	Children's shoes pairs	Slippers pairs
1913	10,650,160	5,260,581	3,217,544	1,820,719	345,866
1919	21,682,751	11,928,156	5,891,753	3,534,670	328,172
1920	17,069,254	7,711,310	5,064,472	4,065,810	227,662
1921	9,019,263	5,173,776	1,767,880	2,061,041	61,566
1922	5,532,933	1,878,269	2,280,085	1,246,338	128,271
1927	5,795,694	2,477,177	1,897,478	1,139,479	281,560
1928	4,681,770	1,870,493	1,783,342	666,435	361,600

**BORAH, WILLIAM EDGAR** (1865– ). An American Senator (see VOL. III). He was again elected to the Senate in 1918 and in 1924. During the World War, he took an active part in all matters relating to war measures, while opposing the League to Enforce Peace and violently advising against the policy of President Wilson, especially in regard to the League of Nations. As delegate-at-large from Illinois, he spoke successfully against the League at the Republican National Convention of 1920. He also opposed the Four-Power Treaty, believing that the United States should stand aloof. Since 1925 he has been chairman of the Senate Committee on Foreign Relations and in this capacity was active in securing ratification of the Kellogg-Briand Peace Pact in January, 1929.

**BORCHARD, EDWIN MONTEFIORE** (1884– ). An American lawyer and educator, born in New York City. He attended the College of the City of New York and afterward studied at New York Law School and the Columbia University Law School. In 1910 he was expert on international law of the American agency of the North Atlantic coast fisheries arbitration at The Hague. In the same year, he traveled through Europe for the Library of Congress and investigated and collected literature on Continental law. He was law librarian of Congress (1911–16), and in 1915 accumulated commercial law material in South America for the Department of Commerce. In 1917 he was appointed professor of law at the Yale University Law School. His published writings include *Guide to the Law and Legal Literature of Germany* (1911); *The Diplomatic Protection of Citizens Abroad* (1916); *The Declaratory Judgment* (1918); and *Latin-American Commercial Law*, with T. E. Obregon (1920).

**BORCHARDT, GEORG HERMANN.** See HERMANN, GEORGE.

**BORDEAUX, bôr'dô.** A seaport of France, ranking third after Marseilles and Le Havre, chief town of the Department of the Gironde, capital of the Province of Guienne, and 328 miles from Paris. The population in 1926 was 256,026. The port of Bordeaux extends downstream on the Garonne River to Bacalan, with an *avant-port* at Pauillac and another recently constructed at Le Verdon. There are subsidiary harbors at Bassens and Blaye. The port has been autonomous since 1925 and contains 7 miles of wharves and 125 miles of railroad lines. The 325 acres of wharves and bond-houses are capable of accommodating more than 2,000,000 tons of goods. During 1927 and 1928, wharf facilities were improved, masonry quays with a piling foundation being substituted for the wooden wharves erected during the War and a 25,000-ton floating dock, electrically controlled, being installed. In 1928, 1449 vessels of 2,195,184 tonnage entered the port, and 1058 vessels of 1,389,630 tonnage were cleared.

The centre of Bordeaux is the Place de la Comédie, on the west side of which is the Grand-Théâtre, one of the finest eighteenth-century theatres in existence. The 12 statues of the Muses and Graces above the colonnade are by Berruer. The Cours de l'Intendance, one of the principal business thoroughfares, leads to the Place Gambetta, in the centre of which stood the guillotine on which 300 persons were executed during the Terror. The Cours du Chapeau-Rouge and the Rue Ste. Catherine, the two chief shopping streets

radiating from the Place de la Comédie, are fine examples of the eighteenth-century street architecture. The Church of Notre Dame, formerly the chapel of the adjoining Dominican convent, has been converted into a Museum of Antiquities. The National Powder Factory and the National Saltpeter Refinery are government-owned. Other manufactures include canned food, shoes, cord and rope, barrels, iron, enameled ware, wines and liqueurs. In June, 1917, the first American troops to participate in the World War landed at the port of Bassens, and from the American Naval District headquarters in Bordeaux were directed during the War the operations of vessels engaged in convoy work and submarine hunting in the vicinity.

**BORDEAUX, bôr'dô', HENRI** (1870– ). A French novelist and critic, born at Thonon, Haute-Savoie, and educated at the Collège de Thonon, the Collège Stanislas (Paris), the Sorbonne, and the Faculty of Law (Paris). He devoted himself to literary activities from 1901 until the outbreak of the World War, when he entered the army, rising from the rank of a captain to that of chief of battalion. He received many decorations and in 1920 was elected to the French Academy. His first book, *La Course à la Vie* (1893), was a volume of poems, but he soon turned to the novel and critical essay. His writings showed him to be a moralist and psychologist rather than stylist. He pleaded society against the individual and upheld tradition, especially that of the family. Some of his more important works were *Jeanne Michelin*, his first attempt at a novel (1895); *Le Pays natal* (1900); *La Voie sans retour* (1901); *La Peur de vivre*, crowned by the French Academy (1902); *L'Amour en fuite* (1903); *La petite Mademoiselle* (1905); *Les Yeux qui s'ouvrent* (1908); *La Croisée des chemins* (1909); *La Robe de laine*, considered one of his best novels (1910); *Le Neige sur les pas* (1911); *La Maison* (1913); *La Maison morte* (1922); *La Chartreuse du Repotoir* (1924); *Le cœur et le sang* (1925); *Les jeux dangereux* (1926); *Le barrage* (1927); *Calvaire de Gimiez* (1928); and *Andromède et le monstre* (1928). Among his works of a critical nature were *Vies intimes* (1904); *Portraits de femmes et d'enfants* (1909); *La Vie au théâtre*, 4 vols. (1910–21); *Quelques portraits d'hommes* (1914); *Jules Lemaitre* (1920); *Le Jeunesse d'Octave Feuillet, 1821–90* (1922); *Amours du temps passé* (1923); *Portraits d'hommes* (2 vols. 1924); *Barbey d'Aurevilly* (1925); *Dans la montagne des Druses* (1926); and *Voyageurs d'Orient* (2 vols., 1926). Inspired by the War were *La jeunesse nouvelle* (1915); *Trois Tombes* (1916); *Les Derniers jours du fort de Vaux*; *Les Captifs délivrés* (1917); *La Vie héroïque de Guynemer* (1918); *Sur le Rhin* (1919); *Le Plessis-de-Roye* (1920); and *La Résurrection de la chair* (1920). Consult *Les romanciers du nouveau siècle*, by Jules Bertaut (1912).

**BORDEN, RT. HON. SIR ROBERT LAIRD** (1854– ). A Canadian statesman (see VOL. III). In 1914 he was created Grand Commander of the Order of St. Michael and St. George; in 1915 he received the Grand Cross of the Legion of Honor; and in 1916 the Grand Cordon of the Order of Leopold. He was honored with the freedom of the city of various British municipalities. In 1917 he formed a Union government and was appointed Secretary of State

for External Affairs. He was a member of the Imperial War Cabinet, the Imperial War Conference held in London, 1917-18, and was present at the Paris Peace Conference in 1919 as a representative of Canada. It was he who presented the Peace Treaty to the Canadian Parliament in the same year. In July, 1920, he tendered his resignation as Premier. In the following year he was elected President of the League of Nations Society of Canada and was Marfleet Foundation Lecturer at the University of Toronto. In 1921-22, he represented Canada at the Washington Conference and signed many treaties in this capacity, among them, the treaty on limiting naval armaments, the four-power treaty relating to insular possessions and dominions in the Pacific Ocean, the treaty relating to the use of submarines and noxious gases in warfare, and treaties in regard to China. In April, 1922, he served as British arbitrator in the arbitration between Great Britain and Peru at Paris. He is the author of *Canadian Constitutional Studies*.

**BORDET, JULES** (1870- ). A Belgian pathologist and bacteriologist, born at Soignes. He graduated from the University of Brussels in 1892 and later became professor of bacteriology, parasitology, and epidemiology and president of the medical faculty there. In 1901 he was appointed head of the Brussels Pasteur Institute. He published two works on immunity, *Études sur l'immunité* (1909) and *Traité de l'immunité dans les Maladies Infectieuses* (1920). In 1919 he was awarded the Nobel Prize in medicine. Bordet discovered complement-fixation, with Gengou, in 1900-01; bacterial hemolysis in 1898, and the bacillus of whooping-cough in 1906. His theory of immunization is far simpler than that of Ehrlich, and many regard him as the leading figure in serodiagnosis and immunization.

**BORGLUM, GUTZON** (JOHN GUTZON DE LA MONTHE) (1867- ). An American sculptor (see Vol. III). Among his later works was a group of 42 heroic figures in bronze, "Wars of America," in Military Park, Newark, N. J. He designed and partly executed the Stone Mountain (Ga.) memorial to the Confederacy. This is a gigantic bas-relief depicting in heroic proportions a group of Southern leaders (Lee, Davis, Stonewall Jackson, Johnston, Forrest, and Stuart), in the midst of marching troops, cut out of the mountain, and being a quarter of a mile in length. The site of the memorial was dedicated in May, 1919, but the work was not begun till 1922. General Lee's head was unveiled Jan. 18, 1924. He was the designer and sculptor of the national memorial built by the State of South Dakota on Mount Rushmore in the Black Hills, dedicated by President Coolidge in 1927.

**BORGLUM, SOLON HANNIBAL** (1868-1922). An American sculptor born at Ogden, Utah (see Vol. III). He was a brother of Gutzon Borglum, sculptor and painter. He made the equestrian statue, "The Pioneer," at the San Francisco Exposition (1915) and executed colossal portrait busts of generals of the Civil War (for the Vicksburg, Miss., National Park). He received the Croix de Guerre for services with the French army in the World War and was active in educational work in the American Expeditionary Force in France.

**BOEL, LUOREZIA** (1888- ). A Spanish lyric soprano, born at Valencia. After six

years of study under Vidal in Paris, she completed her education in Milan and Rome. Her very successful début in Rome as Carmen (Oct. 31, 1908) led to engagements in Paris, Milan, Naples, and Buenos Aires. Her American début took place at the Metropolitan Opera House as the heroine in Puccini's *Manon Lescaut* (Nov. 11, 1912); she immediately established herself in favor. Her brilliant career really began after her overwhelming success as Flora in the American première of Montemezzi's *Amore dei Tre Re* (Jan. 2, 1914). In the next year, she was stricken with an affection of the throat which necessitated a serious operation and for some time it was feared that her career had been ended. Fortunately, she not only recovered entirely, but after her illness her voice even gained in volume. She returned to the Metropolitan Opera House in 1921, where she continued as a regular member.

**BORING, EDWIN GARRIGUES** (1886- ). An American experimental psychologist, born in Philadelphia. Originally destined for an engineering career, he took the degree of M.E. at Cornell University in 1908. Shortly afterward, he became interested in the study of psychology. He was a member for more than 10 years of Professor Titchener's laboratory in which he served first as assistant and then as instructor (1913-18). From 1919 to 1922, he was professor of experimental psychology and director of the psychological laboratory at Clark University. In 1922 he became associate professor of psychology and in 1924 director of the psychological laboratory at Harvard University. Professor Boring's most important contribution has been in the field of cutaneous and organic sensations. He carried through the Heald experiment in cutaneous nerve division and was able to challenge Heald's theoretical conclusions as to the existence of two systems of nerve sensibility. In his systematic outlook, Professor Boring followed the general introspective position of the Titchener school but was more favorably disposed toward the newer doctrines. See *PSYCHOLOGY, EXPERIMENTAL*.

**BORIS III** (1894- ). The King of Bulgaria. He succeeded his father, King Ferdinand, on the latter's abdication, Oct. 4, 1918. King Boris was born at Sofia, the eldest son of King Ferdinand and Marie Louise de Bourbon, and was christened an Orthodox Catholic, the religion of his people, while his father was a Roman Catholic. He was educated in Bulgaria by tutors and at the Cadet and Officers' School. Subsequently, he was aide-de-camp to the King and several generals of the Bulgarian army. In accordance with his promise to act strictly as a constitutional king, Boris has kept more in the background of politics than his father. In 1925, in connection with the Communist activities, an attempt was made on his life. In 1927 he made a tour of Europe.

**BORNEO**. One of the largest islands in the world, situated in the East Indian Archipelago. It has an area of 283,900 square miles. Politically it is divided into: (1) British Borneo which is made up of the divisions North Borneo, Brunei, and Sarawak, covering the northern portion of the island (total area, 77,100 square miles; total population, 832,637); (2) Dutch Borneo, covering the rest of the island, which is made up of the divisions West Coast Borneo and South and East Districts of Borneo (total area, 206,810 square miles; total



population, 1,626,000), and which is administered from the Dutch East Indies. See DUTCH EAST INDIES.

**BORNSCHEIN, FRANZ CARL** (1879- ). An American violinist and composer, born at Baltimore. From 1895 to 1902, he studied at the Peabody Conservatory there, with J. Van Huestein (violin) and O. B. Boise (composition). In 1905 he became violin instructor at that institution and director of the junior orchestra. In 1913 he was appointed conductor of the orchestra of the Baltimore Music School Settlement. From 1910 to 1913, he was music critic of the Baltimore *Evening Sun* and at various times was connected with other publications. He wrote three symphonic poems for orchestra, *The Sea-god's Daughter*, *A Hero's Espousal*, *The Rime of the Ancient Mariner*; a suite, *The Phantom Canoe*; a ballad for baritone and orchestra, *The Djinn*; a violin concerto in G minor; a cantata for chorus and orchestra, *Onawa*; and some chamber music.

**BORODIN, JACOB** (?- ). A Russian diplomat, who as Soviet representative in Peking and later as adviser to the Canton Government, was prominent in the revolutionary disturbances in China in 1926-27. See CHINA under *History*.

**BOROWSKI, FELIX** (1872- ). An American composer, born at Burton, England. He began his musical education with his father, continued in London under A. Pollitzer (violin) and C. W. Pearce (composition), and in 1888 entered the Cologne Conservatory, where he was a pupil of G. Jensen (composition), E. Hauser (piano), and G. Japha (violin). Having taught for some time at Aberdeen, he settled in 1894 in London and devoted himself to composition. In 1897 he became professor of theory and composition at the Chicago Musical College and from 1916-25 was its director. From 1906 to 1909, he was critic of the Chicago *Evening Post* and, from 1909 to 1918, he filled a similar position on the *Record-Herald*. After 1908 he wrote the programme-books for the Chicago Symphony Orchestra. His compositions include a ballet-pantomime, *Boudour* (Chicago, 1919); four symphonic poems, *Eugen Onégin*, *Printemps Passionné*, *Youth* (North Shore Festival Prize, 1923) and *Semiramis*; *Valse Pathétique*, *Marche Triomphale*, *Ecco Homo*, *Élégie Symphonique*, *Trois Peintures*, for orchestra; a piano concerto in D minor; *Crépuscule and Sérénade* for string orchestra; *Allegro de Concert* for organ and orchestra; a string quartet in A minor; a suite and three sonatas for organ; and pieces for violin and piano and for piano solo (*Sonata russe*, etc.).

**BØRRESEN, HAKON** (1876- ). A Danish composer, born in Copenhagen. He studied there with Johan Svendsen, won the Ancker Stipend in 1901 and spent the next three years traveling and studying in Germany. He has written the operas *The Royal Guest* (Copenhagen, 1919) and *Kaddara* (Copenhagen, 1921); a ballet, *Tycho Brahe's Dream* (1924); a symphonic episode, *Thor's Journey to Jotunheim*; an overture, *The Normans*; a violin concerto; a sextet; two string quartets.

**BOSANQUET, bō'sān/kā', BERNARD** (1848-1923). A British philosopher (see Vol. III). His death in February, 1923, came at the height of his creative activity. His last book, left unfinished, was published posthumously by his widow, under the title *Three Chapters on the Nature of Mind* (1923). The works written

since the World War belong to the third period of his work, when he was defending the conception of the absolute. These include *The Meeting of Extremes in Contemporary Philosophy* (1921); *Implication and Linear Inference* (1920); *Life and the Individual* (Processes of the Aristotelian Society, 1918); and *Some Suggestions as to Ethics* (1918). Taken together with the Gifford Lectures of 1911-12 (*The Value and Destiny of the Individual*), they may be regarded as constituting a bulwark against the tide of easy-going philosophies of sentiment to which the modern mind is peculiarly inclined. In *Contemporary Philosophy*, he pointed out how Italian neo-idealism (Gentile and Croce) and British neo-realism (Alexander) converge at one focus after starting from diametrically opposite directions.

**BOSHER, KATE LEE LANGLEY** ("KATE CAIRNS") (1865- ). An American author (see Vol. III). She wrote *How It Happened* (1914); *People Like That* (1915); *Kitty Canary* (1917); and *His Friend, Miss McFarlane* (1918).

**BOSNIA-HERZEGOVINA**, bōs'nia-hēr'tsā-gō-vē'nā. Up to November, 1918, this land continued a territory of Austria-Hungary and was administered from the Dual Monarchy's Ministry of Finance. (It has an area of 19,768 square miles, and a population, in 1921, of 1,899,929, as compared with the 1910 population of 1,895,044.) On Nov. 1, 1918, the Diet constituted itself a national government and took over the administration of the territory; the formation of Jugo-Slavia found Bosnia-Herzegovina a constituent province of that Kingdom.

**BOSPORUS STRAITS**. See DARDANELLES AND BOSPORUS STRAITS.

**BOSS, BENJAMIN** (1880- ). An American astronomer, born at Albany, N. Y. He was graduated at Harvard in 1901 and at once became an assistant at the Dudley Observatory in Albany. In 1905 he became connected with the United States Naval Observatory in Washington and during 1906-08 he was in charge of the Naval Observatory at Tutuila in Samoa, where he made important observations of Newcomb's fundamental stars. On his return to the United States in 1908, he became secretary of the department of Meridian Astronomy of the Carnegie Institution, of which work he became director in 1915. The same year he became director of the Dudley Observatory, in succession to his father. His scientific work has had to do principally with the determination of the star positions and motions. He was a member of the total eclipse expedition to Flint Island in 1908 and in 1912 became editor of the *Astronomical Journal*.

**BOSSANGE, EDWARD RAYMOND** (1871- ). An American architect, born at Enghien in France. He was brought to the United States when nine years old and was educated at Columbia University and at studios in New York and Rome. He was connected at various times with Ernest Flagg, Carrère & Hastings, and Warren & Whitmore; he was also a member of the firm of Bossange & Newton. From 1913 to 1915 he was professor of architecture at Cornell University and in the latter year became a member of the faculty of the Carnegie Institute of Technology, where he was director of the College of Fine Arts, 1915-23; in 1923-26 he was professor of architecture at Princeton and in the latter year became chairman of the division of architecture of New York University.



**BOSTON.** The capital of Massachusetts and the commercial metropolis of New England. The population rose from 686,092 in 1910 to 748,060 in 1920 and to 799,200 in 1928, by estimate of the Bureau of the Census. The population of metropolitan Boston, according to local estimate, is 1,808,845. The area is 409 square miles. During the World War, Boston shipping and port facilities expanded rapidly. In 1919 a dry-dock, the largest in the United States, which had been begun by the State of Massachusetts before the War, was purchased by the U. S. Navy Department and completed. It is 1200 feet long and 120 feet wide and cost more than \$3,000,000. Of the 40 miles of berthing space, an 8-mile front is on a depth of 30 feet or more at mean low water. Boston is the second port in the United States in volume of ocean-borne passenger traffic. From 1905 to 1920, the total water-borne business of the port averaged 9,500,000 net tons. From 1921 to 1925, the yearly average was 13,500,000 tons. In 1926 the yearly average increased to 15,000,000 tons, and in 1927, according to the annual report of the Chief of Engineers, War Department, it had reached 16,599,103 tons, valued at \$1,056,891,407. In 1922 the Boston airport was established. The Legislature made an appropriation for the airport and leased the land in East Boston for use as a landing field for \$1 a year. Additional money was raised by private subscriptions to complete the construction and equipment of the field. It was leased by the U. S. army for military purposes on condition that commercial flyers be allowed full use of the field. Approximately \$1,700,000 has been spent on the land itself, which is filled, and on its development; \$125,000 has been spent on the landing area; and the city has appropriated an equal amount for further development. In addition, the city has appropriated \$125,000 for the Administration and Control Building, the most elaborate to be attempted so far in the United States.

Beginning with 1912, various new subway systems have been built: the Cambridge line was opened in 1912 and the East Boston extension in 1916, the latter .41 miles long and cost \$2,287,000 to construct; the Dorchester tunnel completed in 1918 at a cost of \$10,582,000 was 2.26 miles in length. In 1923 the Dorchester tunnel was extended. In 1928 the construction of an extension of the existing Boylston Street subway was authorized at a cost of \$5,000,000, half to be met by the Boston Elevated Co. and half, by the city of Boston. Another enactment provided for the building of a vehicular tunnel to East Boston. In 1922-23 the State Legislature authorized a new 2-mile northern gateway to give the towns to the north and east of Boston better access to the city. Downtown traffic was expedited by the widening of Kneeland and Tremont streets; by widening Cambridge and Court streets a new direct thoroughfare was provided in the congested district. The most notable development in the city's park system has been the cutting through of the Strandway in South Boston and Dorchester along the shore of Dorchester Bay. This improvement runs approximately six miles from City Point to Neponset. Between the park roadway and the water is a continuous beach, varying in width from 50 to 500 feet, along which various recreational facilities have been arranged. In 1910 the Metropolitan Parks Board, the Metropolitan Sewer Board, and the

Metropolitan Water Board were consolidated under the Metropolitan District Commission. Plans call for the enlargement of the metropolitan water system at a cost of more than \$100,000,000, including the building of a 13-mile tunnel through solid rock at a depth ranging from 250 to 650 feet below the surface.

In 1923 the Legislature created a Division of Metropolitan Planning, which began immediately to coordinate the activities of all the planning boards in the 39 cities and towns of the metropolitan district. The zoning law of the city was amended and the terrace- or tower-building plan was adopted. This plan allows the construction of a building of any height on a given site, provided that the cubic contents are no greater than would be contained in a 155-foot solid structure. In the past few years, building construction has been especially active in the Park Square and Boylston Street business section and in the North Station district, the buildings erected totaling more than \$100,000,000 in value. A new North Station has been constructed by the Boston & Maine R. R. above which was built a vast coliseum or Boston Garden. The assessed valuation of property in Boston in 1927 was \$1,935,619,000; the net debt was \$100,624,000.

Metropolitan Boston is the largest port and market of the allied shoe and leather industries in the world. It is the centre of the most important cotton manufacturing district in the United States; and the largest wool centre in the world, receiving more than half of the raw wool imported into the United States. It is an important candy-manufacturing place and is one of the recognized centres for printing and publishing, holding third place for the whole United States. It is one of the three great rubber manufacturing cities of the United States. In 1927 there were more than 5000 factories in metropolitan Boston, representing an aggregate investment of nearly \$900,000,000 and employing 178,151 persons who received \$237,638,310 in wages. The products manufactured were valued at \$1,280,419,147. Metropolitan Boston has 47.3 per cent of the manufacturing plants of the State of Massachusetts and about 25 per cent of all the factories of New England. In 1927 Boston's exports amounted to 279,522 tons and its imports, to 2,186,434 tons. In 1927 clearings of the Boston Clearing House amounted to \$20,468,065,274. Boston is the home of the Federal Reserve Bank of the first district.

A second section of the Museum of Fine Arts was opened in 1915 and a new wing of decorative arts in 1928. In 1925 Fenway Court, Mrs. John L. Gardner's Renaissance palace, was opened to the public as an art gallery. In 1919 the State House was enlarged by the addition of east and west wings at a cost of approximately \$3,000,000. The police force of Boston went on strike Sept. 9, 1919, to compel recognition by the city administration of the organization of their union and their right to affiliate with the American Federation of Labor. Order was restored and maintained by the State Guard, under Calvin Coolidge, then Governor of Massachusetts. On the third day, the strikers offered to return to duty, but the city, declining to receive them, recruited a new police force at an increased wage scale.

**BOSTON SYMPHONY ORCHESTRA.** See MUSIC, under *Orchestras*.

**BOSTON UNIVERSITY.** A non-sectarian institution at Boston, Mass., founded in 1863.

The student enrollment increased from 1827 in 1914, to 12,234 in the autumn of 1928; and from 1082 in the summer session of 1923 to 10,084 in the summer of 1928; the faculty was increased from 170 members in 1914 to 463 in 1928, with an additional 212 administrative officers and 65 trustees and university council members; and the number of volumes in the library was increased from approximately 43,000 to 150,000. The endowment during the same period reached over \$4,000,000, of which \$965,000 came by bequest in 1918 from Mrs. C. C. Corbin. In 1922 a campaign for \$4,500,000, called the Fiftieth Endowment Fund, was launched; in 1926 a gift of \$10,000 was received from Mrs. Robert Bacon of New York, to found a special lectureship on the United States Constitution in the College of Liberal Arts, the lectures to be given annually by eminent authorities, to be open to the public, and to be disseminated in book form following upon the delivery; a campaign was also successfully completed during 1926 for an additional endowment of \$1,500,000, of which \$1,100,000 was raised by pledges and \$400,000 contributed by the General Education Board. An interesting development in 1924 was the establishment of a School for Police, with a student body of about 50 Boston and suburban officers; the College of Secretarial Science also broadened its scope to include a number of cultural courses, and arrangements were completed for a four-year course for music teachers, leading to a degree, through the combined forces and facilities of the New England Conservatory of Music, Boston University College of Liberal Arts, Department of Music, and Boston University School of Education. In 1924 Mrs. Lucy Jenkins Franklin was introduced into office as the first dean of women at the University, and on that occasion Mrs. Calvin Coolidge and Miss Marion Talbot, dean of women at the University of Chicago, were granted the degree of Doctor of Laws; and a gift of \$100,000 from Mrs. J. W. Wilbur of Brookline, Mass., was announced for the erection of a women's building. In 1925 the "week-end college" was established by the school of education to provide courses for teachers and others who could not attend the regular full-time programme; other developments in the same year included the establishment of a department of journalism with a four-year course leading to a degree in journalism and a graduate department of the College of Business Administration; and in 1926 a bureau of consumer research was established by the department of household economics. Numerous new buildings were provided during the period under review, including dormitories, one for women in the school of religious education, and the other for school of theology students, and in 1928 a 24-acre recreation centre at Riverside, a suburb of Boston, given by William E. Nickerson provided facilities for boating, tennis, baseball, football, winter sports, and social activities, to all students. President, Daniel L. Marsh, S.T.B., LL.D., Litt.D.

**BOSTWICK, ARTHUR ELMORE (1860- )**. An American librarian (see VOL. III). He was president of the Missouri Library Association in 1917 and of the publication board of the American Library Association, 1918-21. In 1925 he visited China by invitation of the Chinese Association for the Advancement of Education, to inspect libraries. He is the author of *Earmarks of Literature* (1914), *The Making of an Ameri-*

*can's Library* (1915), *Library Essays* (1920), and *A Librarian's Open Shelf* (1920). He edited *Classics of American Librarianship*, 3 vols. (1915-27).

**BOSWORTH, EDWARD INCREASE (1861-1927)**. An American theologian, born at Dundee, Ill., and educated at Oberlin College, Yale University, and the University of Leipzig. After a year as pastor of a Congregational Church in Mount Vernon, Ohio, he joined the faculty of the Oberlin Graduate School of Theology, in which he was professor of New Testament languages and literature, 1892-1927, and dean, 1921-23. He was acting president of Oberlin College, 1918-19. His works include *Studies in the Acts and Epistles* (1898); *Studies in the Life of Jesus Christ* (1904); *New Studies in Acts* (1908); *Commentary on Romans* (1919); *What It Means to Be a Christian* (1923); and *Life and Teaching of Jesus according to the First Three Gospels* (1924).

**BOSWORTH, (WILLIAM) WELLES (1809- )**. An American architect, born at Marietta, Ohio. He was graduated at the Massachusetts Institute of Technology (1889), and then worked in the architects' offices of H. H. Richardson, Frederick Law Olmsted, and Carrère and Hastings, and practiced independently in Boston and New York. For his work as resident architect at the Pan-American Exposition, Buffalo, in 1901, he was awarded a gold medal. He designed the Western Union and American Telephone and Telegraph buildings in New York City, the U. S. War College at Belvoir on the Potomac, and the new buildings of the Massachusetts Institute of Technology at Boston. He was made a member of the National Academy of Design in 1928.

**BOTANY**. Investigators in all fields of botanical science have been quite active, and the amount of recent literature turned out has been very large. Without disparaging in any way investigations in other fields, only the more recent discoveries in a few lines can be noted here.

**General**. Following the address of Dr. William Bateson, "Evolutionary Faith and Modern Doubt," which was delivered in December, 1921, the foes of the theory of evolution seized upon it as a repudiation of that doctrine, and numerous hypotheses and explanations were offered as to the origin of species. Later, Dr. Bateson attempted to correct this impression by stating, "Though no one doubts the truth of evolution, we have as yet no satisfactory account of that particular part of the theory that is concerned with the origin of species in the strict sense." He did not consider with favor DeVries' Mutation Theory which has lately been defended by Lotzy and others, as an explanation of discontinuous variation.

A. L. and A. C. Hagedoorn offered an explanation of the origin of species based on the modern conception of the crossing and inbreeding of species. According to their hypothesis, the somatic characters possessed by any group of individuals capable of crossing are determined by the genes of the zygotes which produce them, and variation arises from the blending of genes that are not common to all the members of a group. This implies the influence of environment and Tansley thinks it is conceivable that genes may be altered or new ones created by the long-continued influence of environment. Bonnier reports the changed character of mountain species when grown on lowlands and vice

versa. Stadler reports having produced new varieties of barley by subjecting germinating seeds to X-ray and radium emanations. Similar results were obtained by Goodspeed with tobacco when the reproductive cells were exposed to X-rays. Early in 1929 Clark advanced the theory that plants and animals possess potentialities of variation, the culmination of which is circumscribed by environment. He rejects, to a considerable extent, the time element which is a prominent factor in the commonly accepted theory of the origin of species.

The principles of serum diagnosis, so successfully applied for the recognition of certain diseases of man and domestic animals, have been applied to plants by a number of botanists to determine the relationship of families of plants, and Lange presented a phylogeny of the Ranales based on serum diagnosis and morphological studies. Similar work was in progress in which Nelson and Dworak were making use of globulins from plants to determine resistance to certain diseases, and no antibodies were formed when globulins from resistant plants were injected into experimental animals. Ivanov claimed that every species of plant shares in the chemical attributes of those with which it is clearly related and as the relations become more distant other substances appear that are only remotely related to the original one. This is considered an evolutionary process that can be made use of in the classification of plants and in their successful crossing in plant breeding.

The Manilov reaction, which was developed to differentiate sex in animals, has been successfully applied to plants. Satima and Blakeslee found that sex in fungi and in dioecious plants could be determined by their reaction to certain dyes. Perkins confirmed this reaction and he claims it is due to different oxidizing and reducing powers related with sex.

Loeb, MacDougal and others have devoted much study to colloids, gels, artificial cells, etc., in an attempt to determine the fundamental principles underlying certain plant activities. MacDougal has succeeded in producing an artificial cell that exhibits some of the physical activities of the living cell, and with it he has measured the swelling of biocolloids, and the reaction of certain colloids in the external layers of the cell to the surrounding medium was ascertained. The bearing of some of these studies is noted elsewhere.

**Physiological studies.** Among the studies of plant activity, photosynthesis, or the transformation of carbon dioxide and water vapor into carbohydrates under the influence of light, is one of the most attractive, as it is the connecting link between inorganic matter and organized life. Protochlorophyll, a substance in etiolated seedlings and considered by Liro to be a decomposition product, has been found by Noack, Eyster and others to be a pigment which develops in plants without the influence of light that changes photochemically into chlorophyll upon exposure to light. A specific enzyme is thought necessary for the transformation. Willstätter has shown that the green coloring matter in leaves is composed of two pigments, chlorophyll *a* and chlorophyll *b*, which are normally present in about the proportion of 72 per cent of the former and 28 per cent of the latter, and the greatest synthetic activity of the plant takes place when these proportions are maintained. Wlodek found that chlorophyll *b* increases in leaves during the day and chlorophyll *a* during

the night. Certain fertilizer constituents were also found to influence the ratio between the two forms of chlorophyll.

It is generally asserted that photosynthesis is carried on by the chlorophyll in the chloroplasts, but this appears to be true in part only. Investigations of Irving, confirmed by Briggs, indicated that some other agency than chlorophyll takes part in photosynthesis. Willstätter and Stoll thought an enzymic factor was involved, and Spoehr claimed that the colorless components of the protoplasm of the chloroplasts exerted an important part in photosynthesis. Weinberg suggested that chlorophyll initiated the process of carbohydrate synthesis but that an enzyme was necessary to complete the transformation of the first product of photosynthesis. While carbon dioxide is generally obtained from the air, Pollacci showed that green plants deprived of supplies of carbon dioxide, except through their roots, were able to sustain growth for a considerable time. See CHEMISTRY, ORGANIC.

The commonly accepted theory of photosynthesis is that starch is the first visible product of such activity, but that formaldehyde is the first step in its synthesis. This appears to be confirmed by the chemical reaction of an aqueous solution of carbon dioxide when subjected to the action of ultra-violet light or in ordinary light in the presence of malachite green. Baly, Heilbron, and others demonstrated the formation of formaldehyde in this manner, and Heilbron claimed that photosynthesis was mainly the chemistry of the formation of formaldehyde and the synthesis of other products from it. On the other hand, not Mazé nor Maquenne nor Molisch was able to find any trace of formaldehyde in living green leaves. From chemical evidence, Thunberg deduced the hypothesis that in the assimilation of carbon dioxide by plants, sunlight decomposed water with the formation of hydrogen and hydrogen peroxide. The carbon dioxide reacts with the hydrogen and hydrogen peroxide to form methylene glycol which in turn is transformed into formaldehyde through the loss of a molecule of water. Warburg considered heavy metals in the cells of plants acted as catalysts for the production of formaldehyde from carbon dioxide, and McHargue claimed this as one function for manganese in plants. Baly reported the production in his laboratory of a syrup containing glucose or fructose or both by exposing a large surface of finely divided aluminum hydroxide or other metals, in aqueous suspension, to carbon dioxide in the presence of sunlight. Pictet and Vogel also are reported to have synthesized cane sugar in their laboratories. This would indicate progress in our knowledge as to how plants are built up from inorganic materials.

The theory of Bayer that formaldehyde is the first product of photosynthesis and that carbohydrates are derived by its condensation was rather generally accepted, but there was much doubt as to how the other products were formed. MacDougal did not believe that sugar can be formed by the simple condensation of formaldehyde. Hexoses were considered by Dixon and Mason the first sugars formed, while Davis believed saccharose was the first sugar produced in the process of photosynthesis, and that it was transformed into hexoses for transportation to other parts of the plant. Siegfried claimed that carbon dioxide must combine with some amino acid and that carbamina acid enters into the

photosynthetic process. This theory received support, but Spöehr and Locke subjected salts of carbamino acids to the light of quartz mercury lamps without observing a trace of formaldehyde, ammonia, or hydrogen peroxide. Illumination, temperature, and carbon dioxide content of the air influence photosynthesis, and this led to the theory of Blackman on limiting factors. He claimed that a single factor determined the physiological activities of plants and where a number of factors were involved, the slowest acting one would determine the result. Harder rejected this claim and held that where two or more factors were involved the rate of assimilation would depend on the combined value of all the factors.

Since the announcement by Garner and Allard in 1920 that each kind of plant requires a definite period of daily illumination for its normal growth and reproduction, abundant confirmation has been given to their theory. To this response of plants to length of day they gave the name *photoperiodism*, that is, the length of day required to bring about fructification. It is now believed that photoperiodism not only controls photosynthesis but influences the acidity relations, the form of carbohydrate, the carbohydrate-nitrogen ratio and the water content of the plant. McClelland, in Porto Rico, where the diurnal variation is not great, found that northern varieties of onions would not form bulbs unless the photoperiod was artificially lengthened. Wanser, at Lind, Washington, where there is a marked difference in the length of day and night during the growing season, reported that the heading of wheat could be controlled irrespective of the time of year by adjusting the length of daily illumination. Lubimenko and Szeglova, from their experiments at Leningrad, concluded that, in general, tropical plants require a short photoperiod; temperate-zone plants, a day of from 9 to 15 hours; and subarctic plants, the longest period available. Recent experiments carried on by the U. S. Department of Agriculture with long- and short-day plants which received 12 hours of illumination daily showed that, when the alternate periods of light and darkness were reduced, growth was progressively retarded until the intervals were only about one minute in length. When the intervals were further shortened to about five seconds, normal growth was resumed and all plants behaved as though exposed to a long day. On the other hand, Harvey reported having grown an extensive list of plants from germination to seed-bearing, the plants having been subjected to continual illumination of strong electric light throughout the entire period of growth. Setchell found eelgrass required a rather definite range of temperature for growth and reproduction, and that with this plant there was exhibited no evidence of photoperiodism.

The cause of the movement of water through the stems of plants continued to be undetermined, but additional evidence was offered to explain that phenomenon. It was repeatedly shown that living cells were not necessary for the upward movement of water in vegetable tissues. Dixon is responsible for the cohesion theory that the evaporation of water from the leaves exerts a continuous pull on the water column and investigations of MacDougal confirm this conclusion. Renner, Steinbrinck, and others affirmed that the hypothesis was adequate to explain water conduction. Other investigators claimed there was a

suction force exerted from above, and in partial support of this hypothesis Harris, Gortner, and Lawrence found there was an increased osmotic concentration in the leaf sap from lower to higher levels in trees and other tall-growing plants. They also claimed there was a correlation between the habit of growth, environment, and osmotic pressure in plants. Ursprung and Blum considered that external conditions influenced the osmotic pressure in plants and that there was a daily, as well as an annual, periodicity in osmotic movement. In a later paper, they claimed there was a suction pressure that draws water into the cells. Bose developed an instrument of great delicacy that was said to show the movement of sap, and from his experiments he developed the idea that there were pulsating cells throughout the length of the plant and that their pulsation gave rise to the conduction of sap even in the absence of root pressure and transpiration. Dixon claimed that the transportation of organic substances to the growing points of plants takes place in the tracheæ. The dissolved substances fill the tracheæ and are moved by the forces set up by transpiration, the expansion of growing cells and root pressure.

The principles underlying plant growth received the attention of plant physiologists. Mitscherlich applied a formula to plant growth that was based on the increase in dry weight under the influence of a number of variable factors. Blackman claimed that the growth of annual plants proceeded, in the early stages, at a compound interest rate, but his formula was challenged by a number of investigators. Loeb was responsible for what is called the inhibition hypothesis of plant growth and in one of his last contributions on regeneration and growth, Loeb claimed that polarity in plant growth was determined by differences in the tissues which were reached by ascending and descending sap, and this determined shoot and root growth.

Ecology. This comparatively new branch of botany has become one of great activity. The field of ecology had not been definitely limited, but broadly it includes the relation of the plant to its environment, plant associations, and plant distribution. The relation of the plant, or association of plants, to environment was the subject of many investigations, and numerous studies were published on the ecology of more or less restricted areas. It was generally recognized that vegetation usually reflects the character of the soil, moisture, temperature, etc., and correlations were established between plant associations and soil types that were useful in determining the agricultural value of large areas of land. This led to studies of soil acidity as influencing the occurrence and distribution of plants. Wherry brought together a mass of information which is considered to show that the peculiar floras of bogs, salt marshes, sand barrens, etc., were due to soil acidity, and he believed that soil acidity was of fundamental importance in controlling the distribution of native plants. As a convenient method for determining the soil reaction, the hydrogen-ion concentration of the soil solution had come into common use, and many investigators reported on its value as an index to the dominant features of the vegetation of a soil type. Laboratory studies showed that a certain physiological balance of salts in solution was necessary for the normal growth of plants, but Hibbard claimed that the ratio of the salts could vary widely pro-

concentration is guaranteed. Numerous cases of botulism from preserved olives were found to be due to a concentration of less than 6 per cent of brine. The products of any of the great food-preserving factories may be regarded as safe enough, while some of the small, obscure canneries lack the requisite technical knowledge and equipment, thereby resembling the home kitchen. Of interest in connection with the treatment is the use of the aeroplane for transporting the botulus antitoxin from the source, when the poisoning occurs in an out-of-the-way locality.

Despite the campaign of enlightenment and prevention which has been carried out of late years by State and Federal authorities, this disease is far from being conquered and occasional epidemics still continue to appear in the United States. The incidence of the disease is brought up to 1922 in *Public Health Bulletin* No. 127 and we are informed that there have been in all 91 outbreaks in groups or individuals with totals of 345 cases and 213 deaths, a mortality of 61.7 per cent. Since 1922 and up to 1926, inclusive, there have been recorded 56 additional outbreaks with 159 cases and 124 deaths, a mortality of 78 per cent. This figure indicates that the serum treatment of the disease, from which so much was anticipated, is a disappointment, due to the fact that there are different strains of the *bacillus botulinus*, which require different sera to exert the antidotal effect. Another drawback is the fact that the serum cannot as a rule be obtained in the initial period of the disease when it should be most efficacious. See also VETERINARY MEDICINE.

**BOUCHARD**, bōō'shār' HENRI (1875- ). A French sculptor, born at Dijon, the son of a joiner and woodcarver, who presided over his earliest artistic education. He studied at Dijon and at the École des Beaux Arts in Paris, where he won the Prix de Rome in 1891. He was influenced by Rodin and early evinced a preference for labor subjects, such as the "Laborer in Repose" (1907), "Plowing in Burgandy" (Champs de Mars, Paris), "Accident to a Quarryman," "Man with Hoe," the bronze, "Blacksmith" (Metropolitan Museum, New York City), "The Stevedore" (Luxembourg Museum, Paris), and "The Fishermen." His historical subjects, all Gothic, "Charles the Bold" (Brussels), "The Master Workman," and "Claux Sluter" (Dijon), were no less powerful and characteristic. In a very different vein was his light and charming bronze, "Girl with a Gazelle" (Metropolitan Museum, New York City). His most famous achievement, done in collaboration with Paul Landowski, was the international monument to the Calvinist reformation, austere and sublime, built into the old wall of Geneva. The four great central figures, Farel, Calvin, Knox, and Beza, were by both artists, and those of the six lay heroes, including Oliver Cromwell, the Great Elector of Brandenburg, and Roger Williams, were by Bouchard. He was a realist of great power but in no sense a literalist, and his art was considered synthesized, architectonic, and adapted to the material used, excelling especially in rhythm.

**BOUGHTON**, RUTLAND (1878- ). A British composer, born at Aylesbury. He is practically self-taught, having studied only one year (1900-1) at the Royal College of Music. From 1902-4 he played in the orchestra at the Haymarket Theatre, and from then until 1911

taught at the Midland Institute in Birmingham. A visit to Bayreuth in 1910 aroused his enthusiasm to such an extent, that he resolved to establish a similar theatre in England. For this purpose, he associated himself with the poet Reginald Buckley and both began to work on a series of music dramas from the Arthurian legends. In coöperation with Christina Walshe, they organized the Glastonbury Festival Players and began operations, in 1914, with a performance of Boughton's first opera, *The Immortal Hour*, on a text by Fiona Macleod. The scheme was then interrupted by the War, but in 1919 the company was reorganized. The following year, the Glastonbury Players gave some successful performances in London and an enthusiastic friend even presented to them a site in Glastonbury for the erection of a permanent theatre, but financial difficulties soon compelled them to dispose of the site. Boughton, however, was not discouraged. In the summer of 1920, he resumed operations in Glastonbury on a modest scale and brought out the two first dramas of the Arthurian cycle, *The Birth of Arthur* and *The Round Table*. In 1922 followed an opera based on Euripides' *Alkestis*, and in 1924 the third drama of the cycle, *The Queen of Cornwall*. In the meantime, these performances attracted attention and other companies gave performances in London of *The Immortal Hour* (1922), *Bethlehem* (1923) and *Alkestis* (1924). Besides these operas, Boughton wrote the choral works with orchestra, *The Skeleton in Armor*, *The Invincible Armada*, *Midnight*, and *Song of Liberty*; several a cappella choruses; two string quartets; a violin sonata; and songs.

**BOUHÉLIER**, SAINT-GEORGES DE (1870- ). Pen name of a French author, born at Reuil, near Paris, whose real name was Stéphane G. de Bouhélier-Lepelletier. His works constitute a satire on society, the best of his productions being *Le Carnaval des Enfants*, a three-act play, published in 1910. In most of his writings, he showed the lack of a sense of propriety and often became vulgar. His works, many of which are dramas, include *Discours sur la mort de Narcisse, ou l'impérieuse métamorphose: Théorie de l'Amour* (1895); *L'Affaire Dreyfus; la révolution en marche* (1898); *La Route noire* (1900); *La tragédie du nouveau Christ* (1901); *Histoire de Lucie, fille perdue et criminelle* (1902); *Des Passions de l'amour* (1904); *La Tragédie royale* (1909); *La Romance de l'homme*, poems (1912); *Le mystère des vivants et des morts* (1918); *La Vie d'une femme; Œdipe* (1919); *Esclaves*, a play (1920), and *La Tragédie de Tristan et Yseult* (1923). Consult "L'œuvre de Saint Georges de Bouhélier," by Paul Blanchart, in the *Grande Revue* (Paris) vol. 116, pp. 438-457 (1925).

**BOUHÉLIER-LEPELLETIER**, STÉPHANE G. de. See BOUHÉLIER, SAINT-GEORGES DE.  
**BOULOGNE CONFERENCE**. See REPARATIONS.

**BOULT**, ADRIAN CEDRIC (1889- ). A British conductor, born at Chester. After graduation from Oxford, where he had studied under Hugh Allen, he went in 1912 to the Leipzig Conservatory, and there came into close contact with Niekisch. He came into prominence during the season of 1918-9 as guest-conductor of the London Royal Philharmonic Society. In 1919 he was placed in charge of the classes in score-reading and conducting at the Royal College of Music, and shortly after succeeded Stanford as



conductor of the students' orchestra. In 1920 he conducted the British Symphony Orchestra, the Sunday concerts of the London Symphony Orchestra, and a season of Diaghilev's Ballet Russe. During the following years, he appeared as guest-conductor in Germany, Austria, and Spain, making a specialty of new works by British composers. In 1923 he succeeded Sir Henry Wood as conductor of the Birmingham Festival Choral Society, and the following year was appointed conductor of the Birmingham City Orchestra.

**BOURDELLE, ÉMILE ANTOINE** (1861-1929).

A French sculptor, born at Montauban, the foremost successor of Rodin. Dominated by Gothic traditions, he studied chiefly at Paris, with Rodin, who esteemed him the most important of his followers. His art, however, differed widely from Rodin's, which was essentially pictorial, while Bourdelle's was architectural, essentially sculptural, and dependent on the material. Archaic Greek and Gothic sculpture were the chief influences in his art. His early works include charming studies of girls and young women. More recent productions were a monument to the defenders of Montauban (1902); "The Archer Heracles" (1909, replica in The Metropolitan Museum of New York City); the remarkable reliefs on the Théâtre des Champs Élysées, Paris; monument to the Polish poet Mickiewicz (1917), apostle of Polish independence; monument to General Alvear in Buenos Aires (1915-17), a colossal equestrian statue and four allegorical figures, two of which, "Force" and "Victory," have been called the finest sculptures the World War brought forth. Later productions were a superb madonna and child (1922), in the Gothic spirit, and a monument to the miners of Monceaux who fell in the War. His powerful portraits include busts of Beethoven (Luxembourg Museum), Rodin, Ingres, Anatole France (1919), M. Simu (Bucharest), and Sir James George Frazer (1922), and figures of Carpeaux and Rodin at work.

**BOURDET, bōrd'è, ÉDOUARD** (1888- ).

A French dramatist whose play, *La Prisonnière* (1926), a study of homosexuality, aroused widespread comment. Produced in New York as *The Captive*, it was closed by the police. His other works include *Le Rubicon* (1910); *L'Heure du berger* (1922); *L'Homme enchaîné* (1923); and *Vient de Paraître* (1927).

**BOURGEOIS, bōr'zhw' LÉON VICTOR AUGUSTE** (1851-1925). A French politician (see Vol. III), who served as minister without portfolio in the Briand cabinets (1915-17). He was elected president of the Senate in 1918 and in 1919 became the French member of the League of Nations Commission, doing important work in the drafting of the Covenant. On Oct. 14, 1919, he was named first French representative on the League Council. In January, 1923, he was reelected president of the Senate, but resigned shortly afterward to devote the remainder of his life to the advocacy of the League idea. His particular interest was the control of the illicit drug traffic, and he was one of the signers of the International Opium Convention of 1925. His later writings were *La Politique de la Prévoyance Sociale* (1914), *Le Pacte de 1919 et la Société des Nations* (1920), and *Le Traité de Versailles* (1920).

**BOURGET, bōr'zhā, PAUL** (1852- ). A French novelist and critic (see Vol. III). His later works include *Le Démon de Midi*, a travel

sketch (1914); *Le sens de la Mort* (1915); *Lazarine* (1917); *Némésis* (1918); *Anomalies, stories* (1920); *Laurence Albane* (1920); *L'écouyère, stories* (1921); *Nouvelles pages de critique et de doctrine* (2 vols. 1922); *La gédie* (1923); *Cœur pensif ne sait où il va* (1924); *Conflits intimes, short stories* (1925); *Le danseur mon-dain* (1926); *Nos actes nous suivent* (1927); *Le tapin, L'Enfant de la morte* (1928), and *Quelques témoignages* (1928). Consult *Literary Impressions*, by Jules Lemaître (1921), and *Idées et Portraits*, by Louis Bertrand (1927).

**BOURILLON. See HAMPTON, PIERRE.**

**BOURNE, bōrn or bōrn, THE MOST REV. FRANCIS** (1861- ). An English Roman Catholic cardinal, Archbishop of Westminster. He was born in Clapham and educated in England, Paris, and Louvain, being ordained as a priest in 1884. He was a curate in various English parishes, rector of the Southwark Diocesan Seminary (1889), and became domestic prelate to Pope Leo XIII in 1895. In the next year, he was titular Bisop of Epiphania and Coadjutor to the Bishop of Southwark, whom he succeeded in 1897. In 1903 he became Archbishop of Westminster and in 1911, a cardinal. He received honorary degrees from Louvain and Oxford.

**BOURNE, RANDOLPH (SILLIMAN)** (1886-1918). An American author, born at Bloomfield, N. J., and graduated at Columbia University in 1913, where he obtained a traveling scholarship. He studied in London and Paris (1913-14). Essays which had appeared in the *Atlantic Monthly* and other papers were collected in *Youth and Life* (1913). He was a well-known contributor to the leading American magazines and was a member of the staff of the *New Republic* at its inception in 1914; later, he wrote for *The Seven Arts* (1917) and the *Dial*, with which he was connected at the time of his death. His point of view was radical and always expressed with pointed style. His bitter opposition to the World War, due rather to a high valuation of personality and freedom than to doctrinaire pacifism, was the core of the posthumous *Untimely Papers*, edited by James Oppenheim. Of more general interest was the still later *History of a Literary Radical*, compiled by Van Wyck Brooks. Bourne's other volumes were *The Gary Schools* (1916) and *Education and Living* (1917). A somewhat sentimentalized picture of him is presented in Paul Rosenfeld's *Port of New York*.

**BOUTELLEAU. See CHARDONNE, JACQUES.**

**BOUTROUX, bō'trō', ÉTIENNE ÉMILE MARIE** (1845-1921). A French philosopher (see Vol. III), who, during the World War, made many public addresses which combined patriotism with enlightened internationalism. These addresses, published in book or pamphlet form, include *Certitude et Vérité* (1915), *Philosophy and War* (1916), *The Relation between Thought and Action* (1918), and *L'Amérique dans la Guerre Mondiale* (1918).

**BOVINE TUBERCULOSIS. See VETERINARY MEDICINE.**

**BOWDOIN, bō'd'ın, COLLEGE.** An institution for men at Brunswick, Me., founded in 1794. The student enrollment increased from 394 in 1914 to 559 in the autumn of 1928 and the faculty membership, from 29 to 52. The library was increased from 110,000 to 145,000 volumes, and the productive endowment from \$2,312,552 to \$4,984,000, while the income in 1927-28 amounted to \$250,000. In 1920 the college



offered new courses in philosophy, government, and the fine arts; in 1921, discontinued the medical school, and in the same year reported a marked decrease in the number of students in the more humanistic studies, and an increase in the number of those specializing in chemistry and economics. A chapel organ was installed in 1927 at a cost of \$25,000 and a \$50,000 gift was added to the endowment fund; in 1928, a swimming pool costing \$150,000, and a Union building costing \$200,000, were completed. President, Kenneth Charles Morton Sills, LL.D.

**BOWEN, YORK** (1884- ). A British pianist and composer, born in London. As early as the age of eight, he played a concerto in public. In 1898 he won a scholarship at the Royal Academy of Music, where he remained five years, studying piano with Tobias Matthay and composition with B. Haynes and F. Corder. He is one of the foremost of English pianists and, as a composer, he is at his best when writing for his own instrument. His compositions include two symphonies; two symphonic poems, *Eventide* and *The Lament of Tasso*; three piano concertos; a violin concerto; a viola concerto; a rhapsody for 'cello and orchestra; a string quartet; a string quartet for four violas; a 'cello sonata; two sonatas and a suite for viola and piano; five suites, a polonaise, and many smaller pieces for piano.

**BOWEN, FREDERICK ORPEN** (1855- ). An English botanist (see VOL. III). He was made professor emeritus of the University of Glasgow in 1925, having taught there since 1885. The honorary D.Sc. degree was conferred upon him by Cambridge, Dublin, and Sydney universities and the LL.D. degree by Aberdeen and by Glasgow. He was awarded the Royal Gold Medal, the Linnean Gold Medal, and the Neill Prize of the Royal Society of Edinburgh. A fellow of the Royal Society, he served three terms as president of the botanical section of the British Association for the Advancement of Science. In 1920 he was elected a foreign associate of the National Academy of Sciences (American). His later works include: *Botany of the Living Plant* (1919, 2d ed., 1923); *The Ferns* (vol. i, 1923; vol. ii, 1926; vol. iii, 1928); and *Plants and Man* (1925).

**BOWERS, CLAUDE GERNADE** (1878- ). An American editor and author, born in Hamilton County, Ind., and educated in the public schools and by private tutors. He was an editorial writer for the Indianapolis *Sentinel* and *Terre Haute Star* (1901-06) and editor of the *Fort Wayne Journal-Gazette* (1917-23). Since 1923 he has been an editorial writer for the *New York World*. He was a delegate to the Democratic National Convention of 1908 and secretary to U. S. Senator John W. Kern in 1911-17. In 1918 he was chairman of the platform committee of the Indiana Democratic Convention and in 1920 delivered the "keynote speech" at the State convention. At the National Democratic Convention of 1928, he was temporary chairman and made the opening speech. He is the author of *Irish Orators* (1916); *Life of John Worth Kern* (1918); *The Party Battles of the Jackson Period* (1922); *Jefferson and Hamilton* (1925); and *The Tragic Era* (1928).

**BOWIE, WILLIAM** (1872- ). An American engineer, born at Annapolis Junction, Md., and educated at St. John's College, Trinity, and Lehigh. In 1895 he entered the United States Coast and Geodetic Survey, serving at first in

the field, both in the United States and its colonial possessions, but in 1909 he became chief of the division of geodesy. During the World War, he served in the Corps of Engineers with the rank of major. He has represented the United States at various international geodetic conferences and congresses and was chairman of the Board of Surveys and Maps of the Federal Government, 1922-24. Since 1922 he has been a special lecturer at Lehigh University. His scientific researches have had to do with the theory of isostasy and its applications to dynamic and structural geology. He is the author of *Isostasy* (1927).

**BOWLES, FRANCIS TIFFANY** (1858-1927). An American naval constructor (see VOL. III). In 1917 he became manager of the division of construction and, later, assistant general manager of the United States Shipping Board of the Emergency Fleet Corporation, at Washington, D. C., serving until 1919. He was interested in the development of the Cape Cod Canal. He was a member of the Institute of Naval Architects of London, and a past president of the Society of Naval Architects and Marine Engineers of the United States.

**BOWLEY, ALBERT JESSE** (1875- ). An American army officer, born in Westminster, Calif. He graduated from the United States Military Academy in 1897 and served in the Spanish-American War and in the Philippines. From 1901 to 1905, he was a professor in the United States Military Academy. He served again in the Philippines in 1910-11 and in the latter year was appointed military attaché to China. From 1915 to 1917, he did duty on the Mexican border. In the latter year he organized the 17th Field Artillery, and commanding it in France, participated in nearly all the important actions in which the American Army took part. In 1918 he was appointed commander of the 2d Field Artillery Brigade, 2d Division, and in the same year became Chief of Artillery, 6th Corps. From 1919 to 1920, he was on duty at the General Staff College. He was a member of the General Staff Corps, 1920-21; appointed commander at Fort Bragg, N. C., in 1921. He was promoted to be brigadier general in the National Army in 1918 and in the Regular Army in 1921.

**BOWLEY, ARTHUR LYON** (1861- ). An English economist and professor of statistics at the University of London. He attended Trinity College, Cambridge, and while assistant master at St. John's School, Leatherhead (1883-90), was Newmarch lecturer at University College, London (1897-98), a position which he assumed again during 1927-28. He was lecturer at the London School of Economics and Political Science after 1895. From 1900 until 1919, he taught mathematics and economics at University College, Reading, being appointed to the University of London in 1915. He contributed to scientific periodicals, and wrote *England's Foreign Trade in the 19th Century* (1893, 3d ed., 1922); *Wages in the United Kingdom in the 19th Century* (1900); *Elements of Statistics* (1901, 4th ed. 1920); *National Progress in Wealth and Trade* (1904); *An Elementary Manual of Statistics* (1910, 3d ed., 1920); *A General Course of Pure Mathematics* (1913); *Measurement of Social Phenomena* (1915); *War and External Trade* (1915); *The Division of the Product of Industry* (1919); *Change in Distribution of Income* (1920); *Official Statistics* (1921); *The Course of Prices and Wages during*

the War (1921); *The Mathematical Groundwork of Economics* (1924). Bowley also collaborated in *Livelihood and Poverty* (1915); *The Third Winter of Unemployment* (1922); *Has Poverty Diminished?* (1925); *Is Unemployment Inevitable?* (1926); and *National Income in 1924*.

**BOWMAN, ISAIAH** (1878- ). An American geographer (see VOL. III). In 1915 he became director of the American Geographical Society of New York, and later (1917) received the Bonaparte-Wyse gold medal of the Geographic Society of Paris, for his explorations and publications of South America. In 1918-19 he was chief territorial specialist of the American Commission to Negotiate Peace and became a member of the geographic committee of the National Research Council in 1920. He is the author of *South America* (1915); *The Andes of Southern Peru* (1916); *The New World—Problems in Political Geography* (1921); *Desert Trails of Atacama* (1923); *An American Boundary Dispute* (1923); *The Mohammedan World* (1924); and *The Pioneer Fringe* (1927).

**BOXING.** The retirement of Gene Tunney as undefeated heavyweight champion of the world in 1928 left professional boxing in a somewhat chaotic state. Jack Dempsey, whom Tunney defeated twice (Philadelphia, 1926, and Chicago, 1927) has resisted all appeals that he attempt to regain the championship, leaving a group of rather unsatisfactory candidates for supremacy. Among the more prominent aspirants for the heavyweight title in 1929 are Max Schmeling of Germany, Paolino Uzcudun of Spain, and Jack Sharkey of the United States. Tommy Loughran, holder of the light heavyweight championship, also was considered a possibility. The financial setback which characterized Tunney's final battle against Tom Heeney of New Zealand at the Yankee Stadium in New York City, July 26, 1928, made the boxing promoters wary of offering the big purses that heavyweight fighters demand. The Tunney-Heeney bout attracted only 43,191 persons and produced but \$691,014 in gross receipts, whereas back in 1921 the Dempsey-Carpentier struggle at Jersey City drew more than 80,000 spectators who paid \$1,626,580 for admissions.

In the lighter weight boxing classes, Mickey Walker holds the middleweight laurels, Joe Dundee rules the welterweights, and Sammy Mandell clings to his lightweight honors. Much dissatisfaction prevails in these ranks due to the failure of the champions to defend their titles against their stronger rivals.

Conditions are much more satisfactory in the amateur boxing world where tournaments with hundreds of competitors are conducted on a high sportsmanlike plane. In the larger cities, these amateur shows draw crowds often larger than the professional affairs and afford much keener and more entertaining exhibitions.

Boxing in colleges is steadily gaining in popularity, with the Eastern Intercollegiate, Western Conference, and Coast Conference conducting impressive annual tourneys.

**BOYD, ERNEST** (1887- ). An American critic and journalist, born in Ireland. He was educated in France, Germany, and Switzerland for the British Consular Service, which he entered in 1913. He soon after came to the United States, where his efforts in familiarizing Americans with modern movements in Irish and European literature gave him at once a place of prominence among the younger critics.

His writings in the *American Mercury* and the *Bookman* on American literary types and his causeries, first in the *New York Evening Post* and then in the *New York Tribune*, on Continental literary tendencies, were welcome contributions in the work of building up American critical standards. His writings include *Ireland's Literary Renaissance*, *The Contemporary Drama of Ireland*, *Appreciations and Depreciations*, *Portraits—Real and Imaginary* (1924); *Studies in Ten Literatures* (1925); *H. L. Menck-en* (1925); *Guy de Maupassant—a Biographical Study* (1926); *Literary Blasphemies* (1927); *Studies in Nine Literatures* (1928); and *Voltaire* (1928).

**BOYD, JAMES OSCAR** (1874- ). An American theologian, born at Rahway, N. J., and educated at New York University, the University of Erlangen, and Princeton. From 1907 to 1915, he was assistant professor of Oriental and Old Testament Literature in the Princeton Theological Seminary, and from then until 1921, pastor of the Presbyterian Church of the Redeemer in Paterson, N. J. In 1921 he was named secretary for the Levant for the American Bible Society. His works include *Ezekiel and the Modern Dating of the Pentateuch* (1908) and *Sin and Grace in the Koran* (1912). He edited the *Octateuch in Ethiopic* (1909) and *A Brief Bible History* (1922).

**BOYLE, HUGH CHARLES** (1873- ). Roman Catholic Bishop of Pittsburgh, born at Johnstown, Pa., and educated at Saint Vincent's, Beatty, Pa. He was ordained to the Roman Catholic priesthood in 1898, and acted as assistant in Saint Aloysius' Church, Wilmerding, Pa., and later in Saint Paul's Cathedral, Pittsburgh. From 1916 to 1921, he was pastor of Saint Mary Magdalene's Church, Homestead, Pa. In the latter year, he was consecrated Bishop of Pittsburgh.

**BOYLE, JOHN J.** (1851-1917). An American sculptor, born in New York City and educated at the Pennsylvania Academy of Fine Arts in Philadelphia and at the Ecole des Beaux Arts, Paris. He was particularly successful as a sculptor of Indian figures and is chiefly known for his group portraits of them. "The Stone Age in North America," one of his best works, is in Fairmount Park, Philadelphia. Two other groups by Boyle are "The Alarm," exhibited in Lincoln Park, Chicago, and "The Savage Age" at the Panama-Pacific International Exposition. His work also included the seated "Franklin" in Philadelphia and the figures "Bacon" and "Plato" in the Congressional Library at Washington, D. C.

**BOYLESVE, bwā'lev, RENÉ MARIE AUGUSTE** (1867-1926). The pseudonym of René Tardiveau, a French author born at La Haye-Descartes and educated at Poitiers, Tours, and the University of Paris, who turned to novel writing as his profession. He was received in the French Academy in 1919. That he was a careful observer of provincial life was shown in *La Becquée*, one of his best novels (1901). His work had striking diversity, being realistic, poetical, ironic, humorous, tragic. His writings include *Le médecin des dames de Néans* (1896), *Sainte-Marie-des-Fleurs* (1897); *Le Parfum des Iles Borromées* (1898); *Mademoiselle Oloque* (1899), *L'Enfant à la balustrade* (1904); *Le bel Avenir* (1905); *Mon Amour* (1908); *Le meilleur Ami* (1909); *La Jeune Fille bien élevée* (1912); *Madeleine jeune Femme* (1913); *Tu n'es plus*

rien (1917); *Nymphes dansants avec des satyres*, short stories (1920); *Le dangereux jeune homme* (1921); *Élise* (1921); and *Le Carrosse aux deux lézards verts* (1922).

**BOYNTON, HENRY WALCOTT** (1869- ). An American author (see VOL. III). He was appointed a member of the *Bookman* staff in 1915, and from 1919 to 1921 was on the staff of the *Review*. In 1921 he identified himself with the *Independent* and the *Weekly Review*. He published an edition of Carlyle's *Essay on Burns* (1922); of Tennyson's *Idylls of the King* (1923); and of Longfellow's *Tales of a Wayside Inn* (1925).

**BOY SCOUTS OF AMERICA.** A movement for character building and citizenship training in boys through a programme of work and play; organized in February, 1910, and incorporated by Act of Congress in June, 1918. The number of scouts and leaders increased from about 311,500 in 1910 to 848,559 in 1929. Special emphasis is laid on outdoor activities, such as camping and hiking, and over 200,000 boys camped for at least a week during 1929. Successive ranks of membership may be attained by proving efficiency in a variety of pursuits, including dairying, plumbing, pioneering, physical development, astronomy, music, and chemistry. Boys may become Star, Life, or Eagle Scouts by accumulating a certain number of Merit badges. Sea scouting has been added to the programme in order to teach seamanship and water activities. The Boy Scouts cooperate with the Forestry Department in fighting and preventing forest fires, and in conserving wild life, and trees and plants. They also work with other organizations, and aid in various local campaigns, having been particularly active during the World War. The governing body, the National Council, controls 12 scout districts, which in 1929 were themselves sub-divided into about 650 local councils, which altogether conducted 33,285 training courses for scout leaders. The troops are usually organized in connection with churches or schools; each comprises from 8 to 32 boys, and one scout master appointed by the National Council; patrols are composed of eight boys, or fewer. Boys living beyond reach of the regular organization may join the movement as Lone Scouts. (See LONE SCOUTS OF AMERICA).

In recent years, Scouts have been made a part of important exploring expeditions. Every four years since 1920, Scouts from all parts of the world have held a Jamboree. The first meeting took place in England, and was attended by 360 members of the organization; the second was held at Copenhagen; and in 1929 50,000 boys, representing 67 nations, camped together for two weeks at Arrowe Park, Birkenhead, England. Scout magazines are *Boy's Life*, and, for the leaders, *Scouting*. Headquarters are at 2 Park Avenue, New York, N. Y.

**BRADFORD.** An important manufacturing city and centre of the woolen and worsted trade of England. The population at the census of 1921 was 285,961; in 1927 it was estimated to be 293,200. The municipal area is 22,879 acres (about 36 square miles). The city is connected with the Mersey on the west and with the Humber on the east by canals and is an important railroad centre. The principal textile industries are worsteds, woollens, silks, and cottons; there are also important engineering and iron works and quarries of freestone. The corpo-

ration has erected 156 workmen's dwellings and seven blocks of tenement dwellings under the Housing Act, apart from work on 6054 houses under post-war housing schemes. A storage reservoir of 2,200,000,000 gallons capacity has been constructed on the upper reaches of the River Nidd immediately below Angram Reservoir. The total length of the newly-built Scar House Dam is over 600 yards with a width at the bottom of 140 feet and at the top of 11 feet. Bradford became an episcopal city in 1920, the cathedral of the diocese being St. Peter's (formerly the parish church) which was built in the fifteenth century and which is being enlarged.

**BRADFORD, GAMALIEL** (1863- ). An American author (see VOL. III). He has written *Confederate Portraits* (1914); *Union Portraits* (1916); *Portraits of Women* (1916); *A Naturalist of Souls* (1917); *Portraits of American Women* (1919); *A Prophet of Joy*, poem (1920); *Shadow Verses*, poems; *American Portraits, 1875-1900* (1921); *Damaged Souls* (1923); *The Love of Samuel Pepys* (1924); *Bare Souls* (1924); *Wives* (1925); *Darwin* (1926); *D. L. Moody—A Worker in Souls* (1927); and *Life and I: an Autobiography of Humanity* (1928). Mr. Bradford is a master of the "psychograph" as a method of literary portraiture.

**BRADLEY, FRANCIS HERBERT** (1846-1924). A British philosopher, born at Glasbury and educated at Oxford in the late 1860's, just when the idealistic reaction had set in against the materialistic empiricism of Mill and Spencer. Mr. Bradley identified himself with the Oxford school of Neo-Hegelians. He developed a philosophy of monistic absolutism and for more than 40 years he served as a rallying centre for those who sought in philosophy something more than an echoing of the scientific commonplaces of the day.

An invalid for the greater part of his life, Mr. Bradley has published his few works in the spells between "intervals of compulsory idleness." *Presuppositions of Critical History* (1874) and *Ethical Studies* (1876) exhibit the earlier Bradley, whose idealism is not completely emancipated from a certain empiricism. *The Principles of Logic* (1883) was an epoch-making work which was reprinted with a commentary and terminal essays in 1922. Without doubt Bradley's greatest book is *Appearance and Reality* (1893; 2d ed., rev., 1902). Its thesis involved the fusion of science and religion, and it was calculated therefore to shock the advocates both of modern science and traditional religion. Nevertheless, the work of Mr. Bradley stood up under the attacks of the Anglo-American pragmatists, and after 30 years its influence was distinctly visible in the realistic system of Prof. Samuel Alexander.

*The Essays on Truth and Reality* (1924) constituted a somewhat unsuccessful effort to extend the criterion of the degrees of truth to the world of scientific fact and prediction.

**BRADLEY, HAROLD CORNELIUS** (1878- ). An American chemist, born at Oakland, Calif. and educated at the universities of California and Yale, where he was instructor of physiological chemistry in 1904-06 in the medical school. In 1906 he was called to Wisconsin, where in 1919 he attained full professional rank. In 1910 he became research director of the Woods Hole Marine Biological Laboratory. His original investigations have had to do with such

subjects as the physiological chemistry of the mollusks and the presence of various metals, such as copper and zinc, in marine mollusca, and manganese in fresh-water mussels. He has also studied the chemistry of the human pancreatic juice and the specific nature of hemoglobins.

**BRADY, ALICE** (1892- ). An American actress and singer, daughter of William A. Brady (q.v.). She graduated from the Boston Conservatory of Music, where she was a pupil of Theodora Irvine, and made her professional debut under an assumed name in *The Balkan Princess* in 1911. Later, she sang in Gilbert and Sullivan productions. She played Meg in *Little Women* with much success and appeared with John Barrymore in *A Thief for a Night*. During 1914 her best parts were in *Sylvia Runs Away* and *What is Love?* She began to act for the motion pictures as well as the legitimate stage in 1914 and has appeared in many pictures. Her legitimate successes after 1918 include her playing in *Forever After*, in *Anna Ascends* (1920), *Drifting*, and *Zander the Great* (1923). She was in such film productions as *The Fear Market* and *Sinners*.

**BRADY, WILLIAM A.** (1863- ). An American theatrical manager, born at San Francisco. In 1896 he took over the management of the Manhattan Theatre and in 1911 built and opened the Playhouse with *Sauce for the Goose*. The most notable productions under his management were *Pretty Peggy*, *Foxy Grandpa*, *the Pit*, *The Law and the Man*, *Baby Mine*, *The Boss*, *Buntz Pulls the Strings*, *Clothes*, and *The Man and the Hour*. He has presented Grace George (Mrs. Brady), Robert Mantell, Holbrook Blinn, Cyril Scott, and others. He was president of the National Motion Pictures Industry, 1915-20. In 1917 he was appointed by President Wilson chairman of a commission to organize the motion picture industry to co-operate with the Committee on Public Information.

**BRAGA, BRÁGÁ, THEOPHILO** (1843-1924). A Portuguese philologist and President of Portugal (see Vol. III). He edited and wrote the preface of *Portugal: an Anthology* by George Young (1916).

**BRAGDON, CLAUDE** (1866- ). An American architect, born at Oberlin, Ohio, who has written many books and essays on architectural subjects and was interested in the theatre. He produced *Hamlet*, *Macbeth*, and *Cyrano de Bergerac* for Walter Hampden. His recent books include *A Primer of Higher Space (The Fourth Dimension)*; *Projective Ornament: Four-Dimensional Vistas* (1916); *Architecture and Democracy* (1918); *Oracle* (1921); *Old Lamps for New* (1925), etc.

**BRAGG, SIR WILLIAM (HENRY)** (1862- ). A British physicist, educated at Cambridge. In Australia from 1886-1908 he was professor of physics in the University of Adelaide. He moved to England on his appointment as Cavendish professor of physics at the University of Leeds, 1909-15. Jointly with his son, William Lawrence Bragg (q.v.), he received the Barnard Gold Medal of Columbia University (1914), and the Nobel Prize in physics for 1915. Both shared in other honors for their pioneer work in the study of crystal structure by roentgen rays. From 1915 to 1923, he held the chair of physics in the University of London. He was director of the Royal Institution of

Great Britain and after 1923 he was Fullerton Professor of chemistry there, and director of the Davy-Faraday Research Laboratory. In 1928 he was elected President of the British Association for Advancement of Science. His chief writings are *Studies in Radioactivity* (1912) and *X-rays and Crystal Structure* (1915) written in conjunction with his son, *Concerning the Nature of Things, Old Trades and New Knowledge*, and *Craftsmanship and Science* (1928). He was knighted in 1920. He has received honorary degrees from leading British and American universities.

**BRAGG, WILLIAM LAWRENCE** (1890- ). A British physicist, son of Sir William Henry Bragg (see above) born in Adelaide, Australia, and educated at Cambridge. He was lecturer on natural sciences at Cambridge, 1914-19, but resigned to become professor of physics at the Victoria University, Manchester, in 1919. He was associated with his father in the authorship of *X-Rays and Crystal Structure* (1915), and shared the Nobel Prize for physics with him in the same year. During the World War, while with the British Army as technical adviser on sound ranging, he invented an electric thermometric device which enabled the exact position of the enemy artillery to be determined.

**BRAILSFORD, HENRY NOEL** (1873- ). A British author and journalist, born at Mirfield, Yorkshire, England. He was educated at Glasgow University and taught there for a time; later he wrote for the *Manchester Guardian* and other newspapers. In 1897 he volunteered for service with the Greek Foreign Legion. He was relief agent in Macedonia (1903) and a member of the Carnegie International Commission in the Balkans (1913). He edited *The New Leader*, the British Socialist organ (1922-26), and published *The Broom of the War-God*, a novel, (1898); *Macedonia* (1906); *Shelley, Godwin, and Their Circle* (1913); *The War of Steel and Gold* (1914); *A League of Nations* (1917); *Across the Blockade* (1919); *After the Peace* (1920); *The Russian Workers' Republic* (1921); *Socialism for To-day* (1925); *How the Soviets Work* (1927), and *Olives of Endless Age* (1927).

**BRANARD, DAVID LEGGE** (1856- ). American explorer and army officer (see Vol. III). In 1917 he became brigadier general of the National Army, and the following year brigadier general of the United States Army. He was retired in 1918. In 1926 he was awarded the Cullum Medal by the American Geographical Society for Arctic explorations.

**BRAISTED, WILLIAM CLARENCE** (1864- ). An American naval surgeon, born at Toledo, Ohio, and educated at Michigan and Columbia universities. He served as surgeon-general during 1914-20 and was retired in the latter year with the rank of rear admiral. In 1921 he became president of the Philadelphia College of Pharmacy and Science. He was medical representative of the United States Navy Department during the Russo-Japanese War and fleet surgeon of the Atlantic Squadron during 1912-14. He received decorations from Japan and Venezuela and the Distinguished Service Medal from the United States government. In 1912-13 he was president of the Association of Military Surgeons and in 1919-20 president of the American Medical Association.

**BRAND, CHARLES JOHN** (1879- ). An American agriculturist and economist, born in

Lac Qui Parle County, Minn. He graduated from the University of Minnesota in 1902 and in the year following was assistant curator of botany at the Field Museum of Chicago. From 1903 to 1919, he was in the service of the U. S. Department of Agriculture, in charge of investigation of grasses and cotton. He was chief of the Bureau of Markets from 1913 to 1919 and in the latter year became vice president and general manager of the American Fruit Growers, Inc. He was specialist in marketing for the U. S. Department of Agriculture, 1922-25. Since 1925 he has been executive secretary of the National Fertilizer Association. He served on several important commissions during the World War, besides being a member of the wool section of the War Industries Board.

**BRANDEGEE, FRANK BOSWORTH** (1804-1924). An American Senator (see VOL. III). He was reelected to the United States Senate in 1914 and again in 1920.

**BRANDEIS, LOUIS DEMBITZ** (1856- ). An American jurist (see VOL. III) and Associate Justice of the Supreme Court of the United States. Prior to his elevation to the Federal bench, Mr. Brandeis was prominent as a lawyer and reformer and took an active part in the Zionist movement. He was nominated for associate justice of the U. S. Supreme Court in January, 1916; his confirmation by the Senate was vigorously opposed, but after committee hearings and full discussion, the requisite number of votes was cast in his favor. He took his seat on June 5, 1916. He is the author of *Other People's Money, and How the Bankers Use It* (1914) and *Business—A Profession* (1914), besides articles on trusts, railroads, and Zionism.

**BRANDENBURG, ERICH** (1868- ). A German author, born in Stralsund. He studied law, then history, at the universities of Leipzig, Berlin, Göttingen, and Heidelberg, and became professor at Leipzig. From 1919 to 1920, he was rector of the Leipzig University. He is the author of *König Sigismund und Kurfürst Friedrich I von Brandenburg* (1891); *Die Gefangenahme Heinrichs von Braunschweig durch den Schmalkaldenbund* (1894); *Herzog Heinrich von Sachsen und die Religiösen Parteien im Reiche* (1896); *Martin Luthers Auffassung vom Staate und der Gesellschaft* (1900); *Die Parlamentarische Obstruktion* (1904); *König Friedrich Wilhelms IV Briefwechsel mit Ludolf Camphausen, 1848-51* (1905); *Die Entstehung des Weltstaatsystems* (1907); *Der Eintritt der Südstaaten in den Norddeutschen Bund* (1910); *Die Deutsche Revolution von 1848* (1911); *Deutsche Kriegsziele* (1917); *Martin Luther als Vorkämpfer Deutschen Geistes* (1917); *Wie Gestalten Wir unsere Reichsverfassung* (1919); and *Die Naturalistische Geschichtsauffassung: Ihr Wesen und Ihre Wandlungen* (1920). His latest works are *Von Bismarck zum Weltkrieg* (1924); and *Die Ursachen des Weltkrieges* (1925).

**BRANDENBURG, HANS** (1885- ). A German author and playwright, born in Barmen. He has written verse and fiction and is a student of modern drama and the dance. His books include, in poetry, *In Jugend und Sonne* (1904), *Hinsamkeiten* (1906), *Gesang über den Saaten* (1912), *Italienische Allegien* (1914), *Die Wüsten Stimmen* (1921); the novels, *Brich Westenkott* (1896), *Chloe, oder die Liebenden* (1909), *Das Zimmer der Jugend* (1920); a volume of sketches, *Der Moderne Tanz*, and *Das*

*Theater und das Neue Deutschland* (1919). His latest works are *Joseph Eichendorff, sein Leben und Wirken* (1922), *Der Sieg des Opfers, tragisches Wort- und Tanzspiel* (1922), *Graf Gleichen, a tragedy* (1923), *Legende des heiligen Rochus* (1923), *Friedrich Hölderlins Leben und Werk* (1924), *Pankraz der Hirtenbub, Idyll* (1925), *Sommer, sonnets* (1925), *Vom schaffenden Leben, essays* (1925), *Frauenroman* (1926), *Das neue Theater* (1926), and an edition of pre-Goethe lyricists.

**BRANDES, BRÄNDÉS, GEORG** (MORRIS COHEN) (1842-1927). A Danish critic (see VOL. III) of world-wide reputation. His later works include *The World at War; Der Tragödie zweiter Teil*, a criticism of the Versailles Treaty by a neutral (1919); *Wolfgang Goethe, 2 vols.*, translated by Allen W. Porterfield (1924), the assembling of many years' notes which outline the development of the famous German "from cell up"; *Julius Caesar* (2 vols.); *The Jesus Myth* (1925); *Hellas* (1925); and *Petrus* (1926).

**BRANGWYN, FRANK** (1867- ). A British painter and etcher (see VOL. III). His eight superb mural paintings for the Court of the Ages at the Panama-Pacific Exposition at San Francisco (1915) were masterpieces of color and composition. He also did the mural decoration of the Missouri State Capitol. He wrote *Belgium* (1910).

**BRANSON, EDWIN BAYER** (1877- ). An American geologist, born at Belleville, Kan., and educated at the University of Kansas. In 1905 he became an instructor in geology at Oberlin and four years later was advanced to full professorship. He went to the University of Missouri as professor and head of the geological department in 1910. He devoted much attention to Devonian, Mississippian, and Pennsylvanian stratigraphy, as well as to the geology of Missouri, and is an accepted authority on paleozoic fishes and Triassic amphibians.

**BRANTING, HJALMAR** (1860-1925). A Swedish statesman who first studied astronomy, devoting himself for a time to scientific work in the observatory of Stockholm. By his control of the weekly journal, *Socialdemokraten* (1886-1917), he spread his social doctrines, and for his articles in that publication he was imprisoned in 1888. He then entered politics, founded and led the Social Democratic Party in Sweden (1889), and in 1896 was a member of the Second Chamber of the Riksdag. By his oratorical ability and as a leader of an increasingly powerful party, Branting rose to a position of national influence. In 1917-18 he was Finance Minister of the Eden government, also in 1920 (March-October), 1922, and October 1924 to January 1925. When ill health forced his resignation, he was Prime Minister. He was active in the Second International and in 1920 introduced the question which terminated in a solid majority vote disapproving the Bolsheviks and their régime. He was interested in many international labor gatherings, represented Sweden at several meetings of the League of Nations, where he was a member of the sixth commission to settle questions of disarmament, and favored the Geneva Protocol, in the preparation of which he assisted. In 1921 the Nobel Peace Prize was divided between him and M. Laroze, Secretary-General of the Inter-Parliamentary Bureau at Geneva. Besides political brochures, he wrote *Socialdemokratiens Århundrade* (2 vols., 1903-06).



**BRAUN, HEINRICH** (1854-1927). A German Social Democratic politician and writer on social questions. He edited the important socialist publications, *Neue Zeit*, *Archiv für Soziale Gesetzgebung und Verwaltung*, *Die Neue Gesellschaft*, and *Annalen für Sozialpolitik und Gesetzgebung*. He was Minister for Agriculture in the Prussian government under the presidency of Hirsch (1919). His wife was the daughter of General von Kretschman, an East Prussian Junker. See **BRAUN, LILY**.

**BRAUN, LILY** (1865-1916). A German writer, a feminist and socialist, who kept aloof from party activities. She was born in Halberstadt. Her grandmother was Jenny von Gustedt, an illegitimate daughter of Jerome Bonaparte and a prominent figure in old Weimar. Her father was General von Kretschmann, whose *Kriegsbriege, 1870-71*, she edited. She married Prof. Georg von Gizycki, a leader in the Ethical Culture movement of Germany, and after his death, Dr. Heinrich Braun (See **BRAUN, HEINRICH**). Among her works are *Die Frauenfrage* (1901); *Im Schatten der Titanen*, a novel based on the life of Jenny von Gustedt (1908); *Memoiren einer Sozialistin*, two volumes of autobiography (1909-11); *Die Liebesbriefe der Marquise* (1912); *Mutter Maria*, a tragedy (1913); *Lebensucher*, a novel (1914); and *Die Frauen und der Krieg* (1915).

**BRAUN, OTTO** (1897-1918). A German writer whose one posthumous volume gave him a place in literature. He was the son of Dr. Heinrich Braun and Lily Braun (q.v.) and received his education mainly from private tutors. Although only 16 at the outbreak of the World War, he enlisted and served first on the Eastern, then on the Western front, where he fell in April, 1918. The diary, begun at the age of 10 and containing letters and poems, among them *Eros* and *Psyche*, and five scenes on motives from Apuleius, was published by a friend of his mother, Julie von Vogelstein, under the title *Aus den Nachgelassenen Schriften eines Frühvollendeten* (1920), and appeared in an English translation as *The Diary of Otto Braun* (1924).

**BRAUNFELS, WALTER** (1882- ). A German composer, born at Frankfort, where he studied with I. Kwast and then with Leschetizky and Navratil in Vienna. After further study with L. Thuille in Munich, he settled there in 1903, devoting himself entirely to composition. His works show decidedly futuristic tendencies. He wrote the operas *Prinzessin Brambilla* (Stuttgart, 1909), *Uhlenspiegel* (1913), *Die Vogel* (Munich, 1920); *Don Gil von den grünen Hosen* (Munich, 1924); and *Der Wärrwolf*; *Ariels Gesang* and *Serenade*, for small orchestra; *Phantastische Erscheinung eines Themas von H. Berlioz*, for full orchestra; *Don Juan*, variations for orchestra on two themes from Mozart's opera; *Te Deum*, for chorus and orchestra; *Grosse Messe*, for soli, chorus, and orchestra; *Revelation*, for tenor solo, chorus, and orchestra. He also composed songs for baritone and orchestra; a piano concerto, and piano pieces and songs.

**BRAWLEY, BENJAMIN (GRIFFITH)** (1882- ). An American clergyman and author, born at Columbia, S. C., and educated at the Atlanta Baptist College, the University of Chicago, and Harvard University. He taught English in the Atlanta Baptist College (Morehouse College) and in Howard University (1902-20).

In 1921 he became pastor of the Messiah Baptist Church of Brockton, Mass. Since 1923 he has been professor of English at Shaw University, Raleigh, N. C. Among his publications are *A Short History of the American Negro* (1913; rev. ed., 1919); *The Negro in Literature and Art* (1918); *Women of Achievement* (1919); *A Social History of the American Negro* (1921); *A Short History of the English Drama* (1921); *A New Survey of English Literature* (1925); and *Early Effort for Industrial Education*, a brochure (1923).

**BRAY, FRANK CHAPIN** (1866- ). An American editor (see VOL. III). He was associate editor of *Current Opinion* from 1914 to 1916. In 1919 he was editorial secretary of the World's Court League and editor of the *League of Nations Magazine*, and became in the next year a member of the editorial staff of the *Literary Digest*.

**BRAY, WILLIAM CROWELL** (1879- ). An American chemist, born at Wingham, Ont. He was graduated in 1902 at Toronto and then studied chemistry at Leipzig. He became a research associate in physical chemistry at the Massachusetts Institute of Technology and in 1910 was made an assistant professor. In 1912 he was called to California, where in 1918 he became full professor of chemistry. During the World War, he served with the Chemical Warfare Service in Washington (1918) and as associate director (1919) of the fixed nitrogen research laboratory. His original investigations have had to do with qualitative analysis, ionization, and the halogens, on which subjects he has published papers in the *Journal of the American Chemical Society*.

**BRAZIL.** The largest country on the continent of South America, with an area of 3,285,318 square miles and a population (census of 1920) of 30,635,605. This was a gain of 13,317,049 over the last official census year (1900), or an average annual increase of 3.84 per cent. The average annual increase for the period 1890-1900 had been 2.12 per cent. The density of population increased from 5.2 in 1900 to 9.3 in 1920. The estimated population in 1928 was 39,695,000. The populations of the largest cities were: Rio de Janeiro, 1,157,873; São Paulo, 579,033; Bahia, 283,422; Pernambuco, 238,843; Pará, 236,402; Porto Alegre, 179,263. The steady flow of immigration, which with 1911 began to assume increasing proportions, was checked by the World War, but with 1920 once more took on importance. Between 1820 and 1920, 3,647,301 immigrants entered the country of which 30 per cent entered during the years 1908-20 alone. The greatest single year was that of 1913, when 192,683 reached Brazilian ports. In 1923 there were 86,767 immigrants distributed by nationalities as follows: Portuguese, 31,866; Italians, 15,839; Spaniards, 10,141; Germans, 8254. With the conclusion of hostilities, the Government applied itself once more to the stimulation of immigration and offered agricultural laborers every facility to induce settlement in the Federal colonies. The immigrants in 1925 numbered 84,883; in 1926, 121,629; in 1927, 101,568; but declined to 82,061 in 1928. Portuguese immigrants, who comprise the largest single immigrant movement into Brazil, numbered 32,882 persons in 1928, as compared with 31,236 in 1927 and 38,701 in 1926. The only other groups numbering more than 5000 were the Japanese, with 11,160, and the Italians, with 5493.



**Agriculture.** Only a small fraction of Brazil's soil has yet been brought under cultivation. Of the total area of Brazil only 12,588,000 acres, or less than 1 per cent, were under crops in 1923-24; 6,404,000 acres were under trees, shrubs, and bushes; and about 1,236,000,000 acres were estimated to be covered by woods and forests. There were 650,000 proprietors of land by the census of 1920. Coffee is the leading crop, the annual average production remaining 12,000,000 bags (1 bag = 132 pounds) because of regulations and restrictions. In 1928 the yield was estimated at 24,000,000 bags. The 1928 sugar crop, raised chiefly in Rio de Janeiro and Pernambuco, was 600,000 metric tons, as compared with 851,000 in 1926-27. Cotton, grown chiefly in São Paulo, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Maranhão, and Sergipe, in 1927 amounted to 449,000 bales of 478 pounds each. Tobacco, cultivated in Bahia and Rio Grande do Sul, netted in 1927, 103,747,000 pounds. Cacao (cocoa) cultivated in Espírito Santo and Bahia yielded, in 1927, 161,342,000 pounds. Other important products, with quantity exported for 1912 and 1927, were: Maté (tea) 62,880 and 90,092 tons; rubber, 42,286 and 26,186 tons; hides, 36,255 and 64,172 tons. The packing industry, which was non-existent before the World War, under the stimulation of American capital took on important proportions immediately, the export of chilled and frozen meats in 1927 being 32,004 tons. The exportation of pine, too, became an important factor in Brazilian commerce in recent years.

**Mining.** Gold and diamond industries are steadily languishing, while the industrial ores, under spur of foreign capital, are making considerable strides. Manganese ore, mica, and monazite sand showed the greatest improvements. Of the first, 154,870 tons were exported in 1912 and 241,823 tons in 1927. The mineral exports in 1913 were valued at \$3,412,950, while in 1926 they were worth only \$5,921,341. Coal, heretofore a negligible factor, began by 1920 to play a serious part, so that in 1928 it was estimated that domestic coal (about 392,175 tons in 1926) was supplying one-third of the local needs.

**Manufacturing.** Cotton mills continue to occupy the leading place in Brazilian home industries, the mills increasing from 104 with 761,816 spindles in 1910 to 329 mills with 2,528,611 spindles in 1927. This native industry supplies about three-fourths of the local textile needs. Other indigenous industries are the tobacco, sugar-refining, and shoe manufactures. Recently iron and steel manufacturing have grown steadily, so that by 1927, 70,000 metric tons were being produced annually. Pig iron is turned out in Minas Geraes and steel bars, in São Paulo. By the census of 1920, there were 11,335 factories employing 151,841 hands, with an investment of 665,676,000 milreis and an output valued annually at 741,530,000 milreis. Under the stimulation of a high protective tariff, such artificial industries as brewing, flour-milling, tanning, etc., are being developed.

**Commerce.** The end of the War saw Brazil's foreign trade steadily mounting, the 1920 total value of exports and imports being \$845,469,578, as compared with \$539,285,040 in 1910. Brazil's foreign trade was more satisfactory in 1927 than during the preceding year. It is, however, difficult to measure closely the recent changes because of the fluctuations in exchange (1923,

10.23 cents per milreis; 1924, 10.04 cents; 1925, 12.20 cents; 1926, 14.44 cents; and 1927, 11.84). In terms of milreis, both imports and exports increased from 1923 to 1925, and in terms of dollars, naturally the increase was much greater. In 1926 there was a sharp decrease in milreis values of both imports and exports, but owing to the marked advance in exchange, the decline in terms of dollars was comparatively small. In 1927 in terms of milreis, there was an increase of 14 per cent in exports and 21 per cent in imports, but the exchange value of the milreis was 18 per cent lower, so that there was a considerable decrease in dollar value of exports and a slight decline in that of imports. Although the value of exports in terms of dollars was less in 1927 than the year before, most of the major individual exports were greater in quantity. In coffee, the quantitative increase was about 10 per cent and the increase in milreis value about 9 per cent, while the dollar value fell off 10 per cent. Coffee accounted for 71 per cent of the total value of exports in 1927, as compared with 74 per cent in 1926. Exports in 1927 totaled \$430,899,609. The five leading exports were: Coffee (\$304,555,397); cocoa (\$22,161,286); hide (\$15,484,923); yerba maté (\$12,997,635); and rubber (\$12,548,303). The total value of imports was \$387,035,946. The five leading imports were: Machinery, apparatus, and tools (\$47,827,480); wheat (\$35,141,184); manufactures of iron and steel (\$31,140,120); manufactures of cotton (\$22,032,280); coal, coke, and briquettes (\$20,280,241). In 1928 the exports were valued at \$474,742,676 and imports, at \$441,763,601.

The United States in 1927 continued to be the largest source of Brazilian imports, with 28.7 per cent of the total as compared with 20.3 per cent in 1926. The United Kingdom furnished 21.2 per cent, a considerable gain as compared with 1926. In 1927 the United States took 46.2 per cent of the exports. Germany ranked next, with 10.4 per cent.

**Merchant Marine.** From a merchant navy of 238 steamers of 130,582 tons in 1911, ships flying Brazilian flags increased to 376 vessels, of 100 tons or over, of 525,431 tons in 1927. The Brazilian Lloyd Company, formed of German vessels seized by the Government on its declaration of war, established a regular service between Rio de Janeiro and New York and also with Liverpool and Portugal. In 1926, 24,307 vessels of 35,924,754 tons entered Brazilian ports as compared with 17,072 vessels of 12,927,000 tons in 1905.

**Communications.** In 1928, 19,576 miles of railway were open for traffic as compared with 13,848 miles in 1911. The individual states possessing the greatest mileage were São Paulo, 4227 miles; Minas Geraes, 4758 miles; Rio de Janeiro and Federal District 1763 miles; Rio Grande do Sul, 1882 miles; Bahia, 1218 miles. The principal railway is the government-owned Central of Brazil, which has a total length of 1804 miles of line in operation. This railway connects the city of Rio de Janeiro with the states of Minas Geraes, São Paulo, and Rio de Janeiro and has extended its service to Bahia. In 1926 there were 102,362 miles of telegraph line; 270,617 miles of telephone wires; and 4203 post offices.

**Finance.** The national finances in 1928 showed receipts of 2,216,512,535 milreis, expenditures of 1,922,161,345 milreis, and extraordinary

expenditures of 95,996,994 milreis, leaving a surplus of 198,354,196 milreis. The 1921 account showed a deficit of 56,011,364 paper milreis; for 1922 the deficit was 84,446,437 paper milreis; and the deficit in 1923 amounted to \$21,578,000. In 1926 the deficit was \$4,717,000, while in 1927, for the first time since the War, a surplus was achieved (\$3,029,000). Total budgetary revenues and expenditures for 1929 were calculated at 1,365,295,700 and 1,609,061,299 paper milreis. On Dec. 31, 1927, the consolidated foreign debt included £109,284,000, \$156,890,000, and 335,554,000 francs, making a total dollar amount of \$753,482,000. The internal debt on Dec. 31, 1927, amounted to 288,347,000 paper milreis, and the floating debt on the same date amounted to 190,399,000 paper milreis. Both debts were reduced in 1928. The total paper money in circulation on the above date was 3,004,859,000 milreis, and in 1928, 379,025,000 milreis. The average rate of exchange for the paper milreis in 1925 was \$1.220; 1926, \$1.444; 1927, \$1.184. The milreis was stabilized at \$1.1963 by the law of Dec. 18, 1926. There is no gold in circulation.

**Education.** The advance in educational facilities is inconsiderable since attendance was not compulsory. There are, according to the latest reports (1926), about 24,000 primary schools, 17 agricultural, and 12 commercial schools. Courses in law, medicine, and engineering were given by 29 colleges. In 1920, the University of Rio de Janeiro was founded.

**Defense.** The total peace strength, based on compulsory military service, was, in 1926, 43,015; the complete mobilization force was placed at 120,000 men. The military expense was steadily cut, it being estimated that in 1927 the figure had become 51 per cent lower than that of 1913. No new dreadnaughts were laid down after 1907, but the Government decided in 1921 to reorganize completely the navy under the supervision of American naval officers. A mission, headed by Commander Vogelgesang, was attached in an expert capacity to the Brazilian Naval Department. Dry docks at Rio de Janeiro and five naval stations on the coast were provided for in 1922.

This decision to continue the naval programme of 1906 was received with misgivings by Brazil's South American neighbors, Chile in particular protesting against steps that could end only in an armament-building race. See section on *Brazil* under NAVIES OF THE WORLD.

**History.** Brazil's internal history did not show the settled condition of her important neighbors and revolts continued to trouble her governments and distract attention from more important concerns. A rebellion that broke out in February, 1914, among the rubber collectors of Ceará reached alarming proportions and necessitated the intervention of the central Government. The outbreak of the World War affected Brazil's commercial stability seriously, because of the country's dependence upon the European purchasing and money markets. The temporary falling off of imports and exports with an accompanying decline in customs receipts, the Government's mainstay, led to the establishment of a moratorium for the redemption of foreign securities. Like other South American countries, Brazil naturally gravitated toward the United States, with the result that the trade record steadily mounted. Brazil, like the United States, was forced into the arms of the Allies by

the German submarine campaign and the sinking of three Brazilian steamers. In May, 1917, Congress authorized the President to declare war at his pleasure and seize German interned vessels (about 45 in number). On Oct. 26, 1917, a state of war was declared and Brazil gave much material aid. Late in 1917, a new military act was promulgated providing for a draft army, but this move came too late to give any assistance on the battle fronts. As an ally, Brazil was represented at the Peace Conference, took her place in the League of Nations, and was elected a member of the Council.

Th "A. B. C." Entente of Argentina, Brazil, and Chile was cemented in May, 1915, by the signing of a treaty providing arbitral machinery in case of disputes. Discord did not appear until 1923, when Chile, aroused by Brazil's increased naval programme, brought up pointedly the question of disarmament. A meeting of the A. B. C. powers, preliminary to the annual Pan-American Conference, was held at Valparaiso in January, 1923; but here and at the Conference itself nothing was accomplished. The administration of Dr. Wenceslão Braz (1914-18) succeeded to some extent in cutting the national deficit though that factor always rose to trouble administrators. The success of his administration was due mostly to the great prosperity of the war period when Brazilian products were much in demand. He was followed for the next term by the former president, Sr. Alves, who died in 1919 without assuming office. In the special election following, Dr. Epitácio de Silva Pessoa, then head of the Brazilian peace delegation at Versailles, was chosen to fill out the term, 1918-22. For the presidential term 1922-26, Dr. Arturo da Silva Bernardes was elected. Brazil's centennial anniversary was celebrated by an exposition held in Rio de Janeiro, beginning Sept. 7, 1922. Secretary of State Hughes attended as official delegate of the United States. The cordiality displayed in Secretary Hughes' reception received material confirmation in the most-favored nation agreement which was reached between Brazil and the United States in October, 1923.

The administration of President Bernardes was a troubled one. Revolutionary movements disturbed the peace of the country throughout most of the four-year term. Late in 1922, a revolt in the State of Rio Grande do Sul led to protracted fighting and it was not until June, 1923, that regular troops had the situation under control as a result of the capture of Alegrete, the stronghold of the revolutionists. Much more serious was a revolt beginning July 4, 1924, in the State of São Paulo. The city of São Paulo was occupied by the revolutionists and they were reported to be advancing on Rio de Janeiro. But the Federal government soon had the situation in hand. Its forces besieged the insurrectionists for three weeks in the city of São Paulo, and on July 27 drove them out. The revolt then collapsed. Outbreaks occurred also in Pará, Manaus, Bahia, and other places, and although they were suppressed, the President was compelled to declare a state of siege. For a long while, revolutionary fires continued to smoulder and the Government maintained martial law in affected regions until February, 1927. Its strong measure in putting down these outbreaks led to much bitter political feeling, and the elections due in March, 1926, were looked forward to with apprehension; but in

Dr. Washington Luis Pereira de Souza, the factions fortunately found a candidate on whom they could unite and he was chosen without opposition. He was a former governor of the State of São Paulo and when elected was a Federal Senator from that state. He took office Nov. 15, 1926.

At the meeting of the League of Nations in March, 1926, Brazil refused to accede to the request of Germany for a permanent seat on the Council of the League unless Brazil also should be granted the same position. When this was refused, Brazil, in June, withdrew from the League, giving the required two years' notice. Other international relations continued fairly harmonious. In 1925 a boundary dispute between Brazil, Colombia, and Peru was amicably settled. In 1927 a boundary treaty with Paraguay was signed (ratified in 1929) and in 1928 boundary treaties with Argentina, Colombia, and Bolivia were agreed to. Technical aid in public services was obtained from abroad through a British commission on finance, an American naval mission, and a French military mission. In 1927 the annual Interparliamentary Conference was held at Rio de Janeiro.

At the Sixth Pan-American Conference at Havana, in January and February, 1928, Brazil's representative supported the stand of the United States against an unconditional declaration against all intervention by one country in the domestic affairs of another. Brazil was represented at the Arbitration and Conciliation Conference at Washington in December, 1928, and signed the two treaties issuing from the conference.

Through the post-war period, Brazil's leading preoccupation was her economic development. Possessing vast resources of timber, iron, and water power, it was only a question of years before Brazil would become a nation of great wealth. The government's policy was to foster this growth in every direction, not infrequently by paternalistic methods. Ambitious irrigation programmes were formulated; hydroelectric power sites were mapped; a loan of \$25,000,000 was applied to the electrification of the central Brazil railways; protective tariffs on imports of textiles and the like were established for the encouragement of native industry. To cope with the social problems to which the country's industrialization was giving form, a national labor council was erected in 1923, with an elaborate programme of research, including the study of labor disputes, work days, women and children in industry, etc. It was recognized that an all-important element in internal development was the stabilization of the currency. When President Bernardes assumed office in 1922, he inaugurated a vigorous programme for bringing the country out of its financial morass. He introduced drastic economies, levied new taxes, and cut down the great volume of paper currency. By the end of the year 1925, the annual deficit, which in 1922 had reached 440,000 contos de reis, had been changed into a surplus.

When President Washington Luis took office, in November, 1926, he immediately presented a plan for stabilizing the milreis and a bill to effect that object was passed by Congress on December 18. It provided for a new currency unit, the "cruzeiro," to have a value of 4 milreis and eventually to be represented by a coin containing 2 milligrams of gold nine-tenths fine. The value of the milreis was thus fixed at \$0.11903

United States currency. Following the passage of the law, measures were taken to build up a gold fund looking toward the placing of the country on a gold basis. One of the most important economic developments was the adoption in December, 1924, of a plan for controlling the marketing of Brazil's chief product, coffee. This plan was known as the "Permanent Coffee Defense Plan" and was intended to substitute a continuous control of the flow of coffee to market for the sporadic valorization schemes that had been tried since the beginning of the century. It was to operate as a semi-official enterprise of the State of São Paulo. In the year following its inception, it succeeded in maintaining coffee prices at a good level, thus contributing greatly to the country's prosperity, but the permanent success of this method as an economic device yet remained to be proved.

Brazil's once flourishing rubber industry, almost wiped out by Asiatic plantation rubber, was given new life by a huge concession for planting rubber trees granted to the Ford interests in the United States. The Ford Industrial Company of Brazil was formed in October, 1927. The concession it prepared to work covered 3,700,000 acres on the Tapajós River 150 miles south of Santarém in the State of Pará. Under the terms of the concession, most materials and machinery are admitted free for 50 years.

**BREASTED, JAMES HENRY** (1865- ). An American historian (see Vol. III). He became head of the Department of Oriental Languages in the University of Chicago in 1915. Earl Lecturer at the Pacific School of Religion and the University of California (1918), Hale Foundation Lecturer at the American Academy of Science in Washington, D. C. (1919), and president of the American Oriental Society in 1918. In 1919 he was appointed director of the Oriental Institute of Chicago, and in the year following, he had charge of the archaeological survey for the Institute, in Mesopotamia. In 1925 he was relieved of teaching responsibilities in order to take charge of the work of the Institute and kindred research projects. He is author of *Outlines of European History, I*, with J. H. Robinson (1914); *A Short Ancient History* (1914-15); *Ancient Times, A History of the Early World* (1916); *Survey of the Ancient World* (1919); *History of Europe, Ancient and Medieval*, with J. H. Robinson (1920); *Ancient History Atlas* (1920); *General History of Europe*, with Robinson and Smith (1921); *The Oriental Institute of the University of Chicago, A Beginning and a Program* (1922); *Oriental Forerunners of Byzantine Painting* (1924); *Victorious Man* (1926); *Conquest of Civilization* (1926); and *Edwin Smith Surgical Papyrus* (1928).

**BRECK, JOSEPH** (1885- ). An American art director, born at Allston, Mass. He was graduated from Harvard, studied art in Europe for a year, and did graduate work in art at Harvard, 1908-09. He was appointed assistant curator in the Department of Decorative Arts at the Metropolitan Museum, New York, in 1909 and director of the Minneapolis Society of Fine Arts, 1914. In 1917 he returned to the Metropolitan Museum. His works in art scholarship include catalogues of the Romanesque, Gothic, and Renaissance sculptors represented in the Metropolitan Museum.

**BREMONT, ABÉ HENRI** (1865- ). A French historian of Catholicism who

was born at Aix-en-Provence and educated by the Jesuits there, going to England for his novitiate, where he came under the influence of Cardinal Newman. In 1892 he became a priest and literary writer for *Études*, where he showed brilliance and liberalism in his writings. After about 10 years, he left the Jesuits and their paper, and wrote for the *Revue des deux mondes* and the *Correspondant*. His masterpiece was *Histoire littéraire du sentiment religieux en France depuis la fin des guerres de religion jusqu'à nos jours*, which received the Grand Prix de Gobert of the Academy in 1923, and caused his election to that body in the same year, when the book had reached only six volumes, bringing it to the close of the seventeenth century. His vast amount of reading gave it a cultural solidity, and his sympathy with the subject, the freshness of his point of view, and his flowing, delicate style, a lighter charm. In 1928 its translation into English was begun, and by that year there were eight volumes in French. His works include *Ames religieuses* (1902); *The Mystery of Newman* (trans., 1907); *La Provence mystique au XVII<sup>e</sup> siècle* (1908); *Apologie pour Fénelon* (1910); *Sir Thomas More* (trans., 1913); *Sainte Catherine d'Alexandrie* (1917); *Les deux musiques de la prose* (1924); *Pour le romantisme, essays* (1924); *Le roman et l'histoire d'un conversion* (1925); *La poésie pure* (1926); and *Prière et poésie* (1926, trans., 1928). His books were crowned by the Academy four times, and in 1928 he received the honorary D.Litt. of Oxford.

**BRENNERT, HANS** (1870- ). A German author and poet, born in Berlin. He studied political economy and history, but turned to literature, and has written two volumes of verse, *Landsturm* (1914) and *Frühlingsküsse* (1918); five books of short stories, *Jungfern und Junggesellen: Liebloose Geschichten* (1906); *Lumpel* (1916); *Der Erdbeersüsse Mund* (1919); *Die Stadt ohne Schlaf* (1925), and *Der Wiehernde Amtschimmel* (1925); and the comedies, *Die Hasenpfote* (1901), *Die Indische Amme* (1901), *Der Kaiserjäger* (1905), *Blau und Rot* (1916), *Von Fünf bis Sieben* (1918), and *Bumerang* (1920), besides numerous adaptations of plays from the English, Danish, and French, written either alone or in collaboration with Erich Urban and others.

**BRENT, CHARLES HENRY** (1862-1929). A bishop of the Protestant Episcopal Church (see Vol. III). He was elected bishop of New Jersey in 1914, but declined. In 1919 he accepted the bishopric of western New York. In 1921 he was Duff Lecturer at the universities of Edinburgh, Aberdeen, and Glasgow, and a member of the board of overseers of Harvard University. For his services as chaplain at the General Headquarters of the American Expeditionary Forces in France in 1918-19, he received the Distinguished Service Medal and other honors. In 1920-28 he was bishop in charge of the American P. E. churches in Europe. He was an outstanding advocate of Christian unity and in 1927 presided over the World Conference on Faith and Order at Geneva. He died in Lausanne, Switzerland, and was buried there. He was author of *Presence* (1914); *Prisoners of Hope* (1915); *Inspirations of Responsibility and Other Papers* (1915); *The Revelation of Discovery* (1915); *A Masterbuilder* (1916); *The Conquest of Trouble and the Peace of God*; *Musings* (1916); *The Mount of Vision* (1918); *The Commonwealth of*

*Mankind*, a sermon (1918); and *Soldiers of the Wooden Cross*, an address (1919).

**BRENTANO, FRANZ** (1838-1917). An Austrian philosopher (see Vol. III). He left behind a large number of unpublished scientific writings. Their general content was made known to the scientific world through the biography published in 1919 by Oscar Kraus, with reminiscences by Carl Stumpf and Edmund Hesserl. The papers deal largely with logical theory including the theory of objectives as developed by the so-called Austrian school, the notion of substance, and the scientific utility of that conception.

**BRENTANO, LUJO** (1844- ). A German economist (see Vol. III), descendant of the Brentano family prominent in the romantic period of German literature. He has a great number of works on economic and philosophic subjects to his credit; within the decade 1914-24 he published *Die Anfänge des Modernen Kapitalismus* (1916); *Die Byzantinische Volkswirtschaft* (1917); *Arbeitslohn und Arbeitszeit nach dem Kriege* (1918); *Der Weltkrieg nach E. D. Morel* (1921); *Olemons Brentano's Liebesleben* (1921); *Der wirtschaftliche Mensch in der Geschichte* (1923); and *Konkrete Grundbedingungen der Volkswirtschaft* (1924).

**BRENTANO, THEODORE** (1854- ). An American jurist and public official, born at Kalamazoo, Mich., and educated in the public schools of that city and in Germany and Switzerland. In 1882 he was admitted to the bar by the Supreme Court of the District of Columbia. From 1890 to 1891, he was judge of the Supreme Court of Cook County, Ill., serving also as chief justice. He was appointed Minister to Hungary by President Harding, in 1922, and served until 1927, when he resigned.

**BREBETON, LEWIS H.** (1800- ). An air attaché of the American Embassy in Paris, born in Allegheny, Pa., and educated at St. John's College and the United States Naval Academy. In 1919 he was rated military aviator, for distinguished service against the enemy in action at the front.

**BREST-LITOVSK**, brést'lyé-tófsk' TREATY OF. See AUSTRIA-HUNGARY; RUSSIA, under *History*; WAR, DIPLOMACY OF THE.

**BRETHREN, CHURCH OF THE**. The largest of the five branches of the denomination known as the German Baptist "Dunkers," organized in 1708 at Schwarzenau, Germany, and in this country in 1719. The number of members increased from 95,000 in 1914 to 133,751 in 1928, the number of churches from 1000 to 1031. In 1928 there were 1180 Sunday schools with 135,000 pupils. Mission work was carried on throughout the period in India, China, Sweden, and Denmark, and was begun in Africa in 1923. Subsidies were made to eight colleges, one academy, and a training school, the total enrollment of those institutions being 4843 students. The Five-Year Movement in the church was carried on, from 1920 to 1924 inclusive, for the purpose of general expansion in membership, missionary, and educational fields. *The Gospel Messenger* and *The Missionary Visitor* were the official publications of the denomination.

**BRETON, bre-tôn, ANDRÉ LE** (1860- ). A French poet, one of the most important representatives of the Dadaist school in France. He published an exposé of the doctrine of Dada in the *Nouvelle Revue Française* (August, 1920). Besides this, he was the author of *Rieuse, La*

*Forêt Noire*, influenced by Rimbaud and Mallarmé, *Clé de Sol*, and *Les pas perdus* (1927).

**BRETT, GEORGE SIDNEY** (1879- ). A Canadian professor of philosophy. He was educated at Christ Church, Oxford, and after his graduation entered the Indian Educational Service. He was professor of ethics at Trinity College, Toronto, Canada, and lecturer in the University of Toronto from 1908 to 1916, when he became professor of philosophy in the latter institution. His works include *The Philosophy of Cassendi* (1908); *The Government of Man* (1912); and a standard *History of Psychology*, 3 vol. (1912-21).

**BREWER, SIR ALFRED HERBERT** (1865-1928). A distinguished British organist and conductor, born in Gloucester. Even before completing his studies at the Royal College of Music, he served as organist of St. Katharine's in Gloucester and immediately after his graduation, in 1885, he was appointed organist at Bristol Cathedral. From 1896 till his death, which occurred at Gloucester, Mar. 1, 1928, he was organist and choirmaster at Gloucester Cathedral, conductor of the Gloucester Triennial Music Festival and the Gloucestershire Orchestral Society. In recognition of distinguished services, he was knighted in 1926. Among his compositions, the most important are twelve cantatas which he wrote for several of the great English festivals (Gloucester, Hereford, Leeds, Worcester, Cardiff). He also wrote minor orchestral works, pieces for organ and for piano, anthems and songs.

**BREWER, D(ANIEL) CHAUNCEY** (1861- ). An American lawyer, born at Boston, and educated at Williams College and the law departments of Boston and Princeton universities. He was admitted to the bar in 1888, and from that time practiced in Boston. He was president of the North America Civil League for Immigrants; a member of the Immigration Committee of the National Civic Federation, the Massachusetts Committee of Public Safety, and the Massachusetts Constabulary Commission; and in 1917-18, was chief of the Foreign-Speaking Soldier Section of the General Staff, United States Army. He was the author of *Rights and Duties of Neutrals* (1916); *The Peril of the Republic* (1922); *Conquest of New England by the Immigrant* (1926); and he wrote on international law in various reviews.

**BREWSTER, BENJAMIN** (1860- ). A bishop of the Protestant Episcopal Church, born at New Haven, Conn., educated at Yale University and at the General Theological Seminary, New York City. In 1886-1906 he was minister or rector of churches in New York City, South Orange, N. J., and Colorado Springs, Colo. He was dean of Saint Mark's Cathedral, Salt Lake City, Utah, 1906-09, and from the latter year until 1916 he was missionary bishop of western Colorado. In 1916 he became bishop of Maine.

**BRIAN, DONALD** (1877- ). An American actor and singer born at St. Johns, Newfoundland. After his first stage appearance at Lawrence, Mass., in 1896, as Hardie Grant in *Shannon of the Sixth*, he appeared continuously in American theatres; later successes included characterization of Sandy Blair in *The Girl from Utah* (1914), the Grand Duke in *Sybil* (1916), André de Courcy in *Her Regiment* (1917), Robert de Lambrigue in *The Girl Behind the Gun* (1918), and Sunny in *Buddies* (1919). This last rôle made him known all over the United States when he toured with the

production, 1920-21. Other musical productions in which he played leading rôles included *No, No, Nanette* (1925-26), and *Breakfast in the Sun* (1927-28).

**BRIAND, bre'ân, ARISTIDE** (1862- ). A French statesman (see VOL. III), who was Minister of Justice in Viviani's cabinet from Aug. 26, 1914 to Oct. 29, 1915, when he succeeded his chief as Premier and Minister of Foreign Affairs. The World War period was trying, one of the chief difficulties being with Great Britain over the Saloniki expedition, but he remained in power until Mar. 19, 1917, when he was succeeded first by Ribot and then Clémenceau, who had been one of his chief critics. From Jan. 13, 1921, to Jan. 15, 1922, he was again Premier and Minister of Foreign Affairs, attending, for about 11 days, the Washington Disarmament Conference of December, 1921, where he eloquently presented France's need of a strong military defense, at the same time denying all charges of imperialism. In Europe, his chief difficulty was in the carrying out of the Versailles Treaty. The French Nationalists demanded stronger and stronger measures against Germany, and England warned that the Allies would regret it in the end if they suppressed Germany too severely. After a year of this, he resigned voluntarily, returning to the Government as Minister of Foreign Affairs under Poincaré on Apr. 17, 1925, a position which he held continuously thereafter, with the exception of the three-day Herriot ministry in July, 1926, in spite of the many changes of cabinet chiefs. He was again Premier as well, from Nov. 28, 1925, until July 20, 1926, during the discouraging and difficult period of the steady fall of the franc. As Foreign Minister, he was more successful, carrying out a policy of rapprochement with Germany marked by the Locarno treaties (December, 1925), the entry of Germany into the League of Nations (September, 1926), and the agreement to call committees of experts to discuss the reparations problem and the possible evacuation of the Rhineland before 1935, the date set by the Treaty of Versailles (September, 1928). He and Herr Stresemann worked together with infinite patience and frequently in spite of great difficulties within their respective countries, and were awarded the Nobel Prize of 1926 for their efforts on behalf of peace. In 1927 Briand suggested a pact to outlaw war between France and the United States, which resulted in the signing, at Paris in August, 1928, of the Kellogg Pact to outlaw war by 15 nations, and its subsequent ratification by the United States and numerous other signatories. On July 29, 1929, Briand was called upon for the eleventh time to form a Ministry, in which he became Premier and Foreign Minister. See FRANCE, under *History* and *KELOGG-BRIAND PACT*.

**BRICK.** See *ROADS AND PAYMENTS*.

**BRIDGE.** Auction bridge is a development of the more restricted card game, bridge, which in turn had developed from whist. There are four players, and the dealer has the first right to "bid," that is to name the trump suit, or "no trumps," and the number of tricks he expects to take over the "book" of six which he must win to score at all. Each player, starting at the dealer's left, then has an opportunity to overcall, to double, or redouble, and the bidding is continued until every one is satisfied.

According to the auction laws adopted by the Whist Club of New York, which took effect Apr.



5, 1926, each "odd" trick, that is, each above the book, counts as follows: 10 points with no trumps; 9 with spades as trumps; 8 with hearts as trumps; 7 with diamonds; and 6 with clubs. Thirty points constitute a game, the rubber ending when either side has captured two games, the winners being permitted to add 250 to their honor score. These and other bridge laws have been frequently changed according to usage, and the bidding in England, as authorized by the Portland Club, is determined by the value of the suits, while in the United States, the number of odd tricks bid is the determining factor.

The honors comprise ace, king, queen, jack, and ten of the declared suits. In the United States, if one side holds three trump honors it counts 30 points; four honors, 40 points; four in one hand, 80 points, two in one hand and three in the other, 50 points; four in one and one in the other, 90 points; and five in one hand, 100 points. No-trump honors count relatively the same, four aces in one hand amounting to 100.

Since 1918 a new form of the game, "Contract Bridge" has been evolved in the United States, laying the emphasis on skillful bidding, as no tricks won over those contracted for count in the scoring. The game now has wide vogue in the United States and England has recently adopted it. With it has gone "majority calling," and in 1929 the Portland Club of London adopted a provisional code of laws for contract. **CONSULT:** *Lenz on Bridge* (1927), by Sidney S. Lenz, and *The Heart of Contract Bridge* (1928), by Thomas L. Staples.

**BRIDGE, FRANK** (1879- ). A British composer, born at Brighton and educated at the Royal College of Music in London. He has the reputation of being one of the finest viola players in England. In 1910-11 he was conductor of the Brema opera season at the Savoy Theatre, and in 1913 assistant to Beecham at Covent Garden. After that, he appeared frequently as guest-conductor of the principal English symphony orchestras and, in 1923, made a tour of the United States, conducting his own works with several of the leading American orchestras. As a composer, he shows a decided predilection for chamber music. His works include a string quartet in E minor; three *Idylls*, three *Noveletten* and *Phantasy* for string quartet; a string sextet in E, performed at the Berkshire Chamber Music Festival (1923); a piano trio; and for orchestra, a symphonic poem, *Isabella*; *Dance Rhapsody*; a suite, *The Sea*; *Dance Poem*; a tone-poem, *Summer*, several compositions for piano, for piano and violin, and for organ.

**BRIDGEMAN, RT. HON. WILLIAM CLIVE** (1864- ). A British statesman, educated at Eton and Trinity College, Cambridge. He was on the London School Board for Hackney (1897-1904), and was elected as a Unionist member of Parliament by Oswestry in 1906. He was a junior opposition whip (1911), a junior Lord of the Treasury (1915-16), and Parliamentary Secretary to the Ministry of Labor (1916-19), and to the Board of Trade (1919-20). He then became Secretary of Mines (1920-22), Home Secretary (1922-24), and First Lord of the Admiralty (November 1924- ). In the latter office, he effected large economies and was one of the delegates to the unsuccessful Geneva Naval Conference of 1927. He was made a Privy Councillor in 1920, an Ecclesiastical Commissioner in 1923, and a viscount in 1929.

**BRIDGEPORT.** A city and port of entry of Connecticut on Long Island Sound. The population increased from 102,054 in 1910 to 143,555 in 1920 and to 180,000 in 1928, according to local estimate. The area is 14.6 square miles. While the population of the city proper had increased but 40.7 per cent, the population of the area immediately surrounding Bridgeport has increased 52.4 per cent. In the suburban territory of Bridgeport is a population of about 50,000 which would make the total population for Bridgeport and its suburban area more than 200,000. In 1913 a city-planning commission was organized. Since 1916 this commission has been chiefly concerned with a number of special problems, one of the most important of which is traffic congestion. Bridgeport is a zoned city, its zoning ordinance having been adopted in 1926. There are seven zones—three for residence and two each for business and industry. The maximum allowable height of buildings in business districts is 150 feet. During the World War, a large proportion of the ammunition used by the United States and the Allies was made in Bridgeport. The Remington-U. M. C. Company built several large factories, employing 20,000 men night and day in eight-hour shifts. Bridgeport's manufactures cover a vast variety of products estimated to total more than 5000 different items. The number of persons gainfully employed, including non-manufacturing industries, is estimated to be 50,000. During the peak of 1919-20, the total reached 53,000. One-fourth of the city's built-up area is devoted to manufacturing plants and their value constitutes more than 30 per cent of the taxable wealth of the community. The total amount of capital invested in Bridgeport industry is estimated to be \$200,000,000 and the value of products manufactured is more than \$150,000,000 annually.

Bridgeport has complete customs facilities. A considerable portion of imports are forwarded from New York and other large ports in bond, thus saving much time and trouble. The value of goods passing through the local customs in 1928 was \$2,205,417. The amount of Bridgeport's domestic water-borne commerce in 1927 was 1,146,852 tons, with a value of nearly \$100,000,000. Manufacture for export is a prominent feature of Bridgeport industry. In the case of some factories, nearly one-fifth of the total output is destined for export use. A modern port and industrial terminal is to be erected, the plans contemplating an initial expenditure of about \$250,000 for rail, dock, and warehouse facilities. The Bridgeport airport, which is operated by the Curtiss Flying Service, is one of the leading airports of the East with facilities for both land and sea planes. The Board of Education has embarked upon a five-year building programme, the proposed school improvements being estimated at \$2,000,000. The Bridgeport State Trade School, one of a chain of nine similar schools under the direction of the State Board of Education, has been completed at a cost of \$400,000. It has monthly enrollment of 450 day, and 750 evening, students. Bridgeport has 14 banking houses, two of them privately owned, with estimated combined resources of more than \$150,000,000. The assessed valuation of property in Bridgeport in 1928 was \$284,217,255; the net bounded debt was \$14,155,000.

**BRIDGES.** In reviewing the recent progress of bridge construction, the fact, of course, first to be faced was the destruction of the World



War, a period when Continental bridges were demolished rather than constructed. After the Armistice, Continental bridge building, in those areas most completely wrecked by the War, was of a temporary character and, even later, the lack of funds has prohibited great expenditures for this work in Europe. It is necessary, therefore, to look to America, unravaged by the War and financially well equipped, for the most important developments and progress with bridges during the period under consideration.

Even in America, however, the War brought important economic changes which greatly influenced many activities, among them bridge construction. Principal of these changes has been the great and apparently permanent increase in the cost of labor and in the cost of those materials involving large labor items in their preparation or manufacture. This has led to a careful search for more economical methods of construction, the machine has displaced, wherever possible, hand methods in building as it had already displaced hand methods in manufacture. It has led to a search for special forms of construction which promised economy of material, such, for example, as the use of the rigid frame and continuous construction reinforced concrete design. There has also been an interesting development of heat treatment for steel rendering it capable of carrying greater loads with safety. Special high-carbon and alloy steels have been used—forms which offered no economy before the War, when the cost per unit of strength of ordinary structural steel was lower than that of these specially treated or prepared metals. Thus, as was observed many years ago by Wellington, a well-known American railroad engineer, economic pressure, rather than simply the desire to refine and improve, is still the main force which makes for perfection of engineering design.

With these changes, cut-stone masonry, brick-work, and much of timber construction, before the War almost obsolete, now have disappeared. The great era of masonry-arch construction inaugurated on the Pennsylvania Railroad under William Brown in the early nineties was superseded by an era of steel-and-concrete viaducts. The masonry arch is used only where aesthetic values are sought. Indeed, it would appear today that the greatly increased cost of concrete has, at least temporarily, held up construction of great concrete bridges and given a new impetus to steel designs.

Combined with these economic factors which have affected bridge construction has been the remarkable shift of emphasis from railroad to highway bridges. The railroads of the principal countries of the world have been built. In America, the nineties saw the replacement of the last of the old wrought-iron railroad bridges by steel, and, in the earlier years of the present century, railroad bridge work, with a few notable exceptions, has been largely a matter of replacing structures which, although far from worn out, had become unsafe for the heavy modern locomotive and train loadings. In 1905 Cooper's E-40, a theoretical locomotive having 40,000 pounds on each pair of driving wheels, was considered heavy enough for railroad bridge design. In 1917 the Hell Gate Arch was designed for a Cooper's E-60, an increase of 50 per cent.

These increased train loads, as well as advances in car designs, giving a greater ratio of

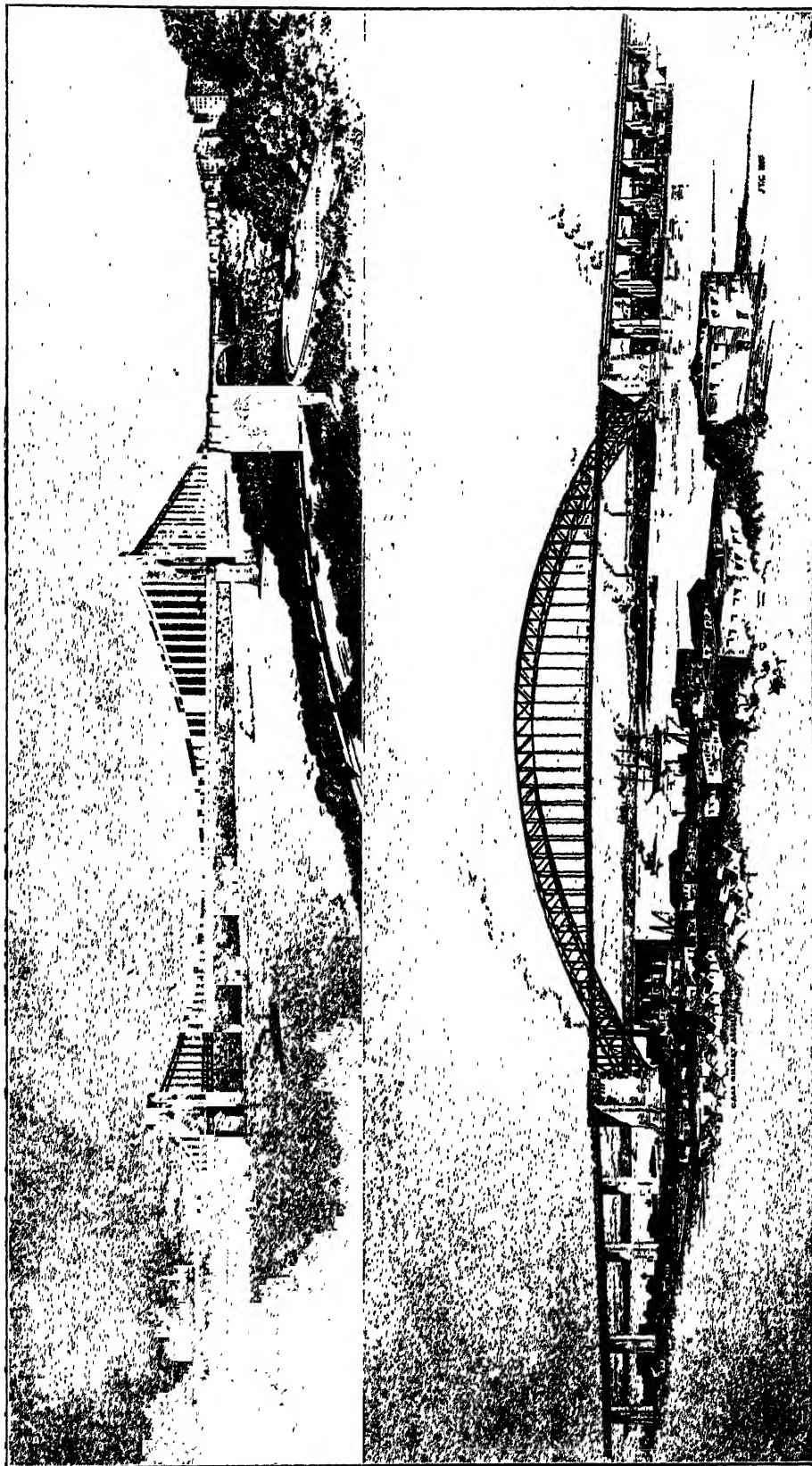
paying load to dead load, came largely as the response of the railroads to the limits set on operating costs by the labor union on the one hand and the Interstate Commerce Commission on the other, and thus form another example of economic influence in engineering design. It would appear that at least a temporary maximum had been attained in this loading increase. Railroad bridge building has apparently reached a state of equilibrium. The exceptions are to be found in such special works as the connecting railroads of which the Hell Gate Arch and the Castleton, or Smith, Bridge are examples, and in such great work as the Lackawanna Railroad concrete viaducts.

On the other hand, the remarkable growth of motor transportation has brought the highway bridge to the fore. The automobile has advanced highway construction from a neglected art, an activity totally overshadowed by railroad work and generally considered in engineering circles as relatively unimportant, into the forefront of transportation problems. It has often been impossible to meet the costs of the great highway bridges demanded by this rapid growth from current highway building funds. Recent years have witnessed a return to the toll-bridge method of financing, a method used in the early days of American road building to meet a similar situation. This "orgy of toll-bridge building," as it has been called, was summarized by the Bureau of Roads of the U. S. Department of Agriculture in a report of conditions as of Jan. 1, 1928. At that time, there were 233 toll bridges in the United States of which over 80 per cent was privately owned. The toll bridge had almost been abolished in America, but the fact that over a third of these bridges had been built since 1910 and that 29 new toll bridges in 1929 were under construction and plans for 163 additional bridges of this class were either under way or proposed shows clearly that the demand has been sufficient to encourage this form of investment. Indeed, we have just begun to develop our highways, and highway bridge building promises to be the principal bridge activity of the future.

Almost all these bridges are on the 186,000 miles of the Federal Aid Highway System and the large percentage of private ownership has led to considerable agitation against this practice. Although private ownership under a franchise limited in life is the usual procedure, it would appear that the scheme of State or commission control and construction on a plan whereby the structure becomes free as soon as tolls have fully met construction and financing costs is certain to be extended. The work of the New York Port Authority is a notable example of this method and, provided it can be kept free of political influence, appears to be an ideal solution of the problem.

In the matter of highway-bridge loadings, there has been a continued increase due to the increase in motor-truck loadings and weights. While as much as 25 tons on four wheels has been used in some American designs, a smaller load, even 15 tons or less, has been far more common. On the other hand, British practice is to use much heavier loadings and such a notable bridge as the Gateshead-Newcastle Arch was designed for 100 tons on four wheels. While it is clearly recognized that British motor transportation, in view of the relatively short haul common in the British Isles and the consequent

## BRIDGES



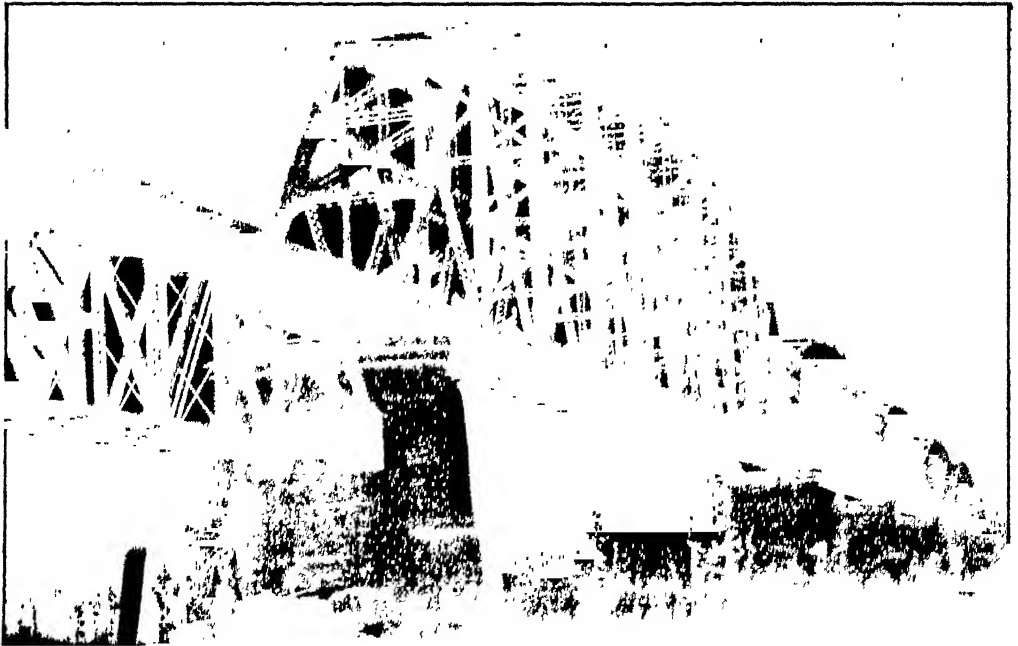
*Photographs courtesy of the Port of New York Authority*

1. Hudson River Suspension Bridge from Fort Washington, New York City to Fort Lee, New Jersey.
2. Arch Bridge Spanning the Kill Van Kull from New Jersey to Staten Island, New York.

## BRIDGES



SCIOTOVILLE BRIDGE OVER THE OHIO RIVER



*Photographs courtesy of Railway Age*

METROPOLIS BRIDGE OVER THE OHIO RIVER

MODERN TRUSS BRIDGES

economies of this type of transportation, is certain to require much heavier highway bridges than is the case in America, it also seems possible that American engineers are designing some highway bridges for loads which may prove to be too light, as has been the case with the older railroad bridges, for future traffic requirements. Private ownership, with the inevitable demand for a reduction of costs to a minimum, has doubtless had some influence on the adoption of loadings which in many cases appear to leave small margin for future increase.

Another tendency, which cannot be viewed with full satisfaction by many engineers, is that toward increased working stresses. It is argued that, with modern methods of manufacture, structural materials, particularly steel and concrete, are so uniform in quality that it is safe to work them at considerably higher stresses than those now prevailing, particularly where loads are known with a high degree of exactness or where maximum loadings are infrequent. To cite an example, the heat-treated eyebars of the Florianopolis Bridge having a specified elastic limit of 75,000 pounds per square inch are designed for a maximum stress of 50,000, or  $\frac{2}{3}$  the elastic limit, whereas past practice has generally favored a factor of  $\frac{1}{2}$ . There also has been some agitation for higher stresses in building construction particularly in New York. While some increases are doubtless reasonable and can be justified as conservative practice, such increases should be made only in cases where real improvements in manufacture, design, or construction justify them and not solely in response to demands for decreased costs.

As far as bridge types are concerned, there have been no notable new developments since the adoption in the United States of the rigid frame type of structure for the smaller reinforced concrete bridges such as are seen in the Bronx and Westchester Parkways, near New York City.

**Suspension Bridges.** Suspension bridges continue to be favored for the longer spans and for highway loads, loads which, although heavy compared with former road requirements, are light compared with modern railroad loadings. From the standpoint of span, the Delaware River Bridge (1926), between Camden, N. J., and Philadelphia, Pa., established a new record with a span of 1750 feet, or 155 feet longer than the old Brooklyn Bridge. The Bear Mountain suspension, crossing the Hudson River at a point between Peekskill and Bear Mountain State Park, N. Y., a highway toll span finished in 1925, also deserves mention for its span of 1632 feet with unloaded backstays. All these spans will be exceeded by the Detroit-Windsor International Bridge (1850 feet), under construction in 1929, while the stupendous Hudson River Bridge (3500 feet) also building, between Fort Lee, N. J., and Washington Heights, N. Y., will be double any now completed span.

The limit to size in suspension-bridge construction is reached when the structure becomes so heavy that it is capable of supporting only its own weight, and, as this limit has been estimated at some 10,000 feet, the great Hudson River Bridge is hailed as simply a milestone in the natural growth of suspension spans. Indeed, a suspension span of even greater length than the Hudson Bridge has been seriously discussed for crossing the Narrows at the entrance to the upper bay, New York, between Brooklyn and Staten Island.

In the details of design and construction of suspension bridges, several interesting developments have occurred. The Florianopolis Bridge, built in southern Brazil in 1926 with a span of 1113 $\frac{3}{4}$  feet, is not only the longest span in South America but is the longest eyebar suspension bridge in the world. Although the first suspension bridges, a type of American origin, were built with wrought-iron chains, the wire-cable method, first perfected in France and with which the name of Roebling in America is always connected, has generally shown greater economy and has therefore been most commonly used. In the Florianopolis Bridge, an ingenious scheme was developed whereby a portion of the cable formed the upper chord of the central part of the stiffening truss. This economy in design, combined with the fact that the steel company, interested in seeing their special heat-treated eyebars introduced in practice, gave low figures on this construction, made this type of bridge more economical than a wire suspension. See *Trans. Am. Soc. C. E.*, Vol. 92 (1928), p. 266.

In wire suspension-bridge construction, the most interesting two developments have been the spinning of cable strands on land, rather than in place, and the use of special heat-treated wire. In two Ohio bridges of comparatively small span, those at Portsmouth (700 feet) and Steubenville (689 feet), the strands, or bundles in which the wires are first formed, were made on land, were moved into position by means of special carriers supported by a high construction, or messenger cable, and were finally compressed and wrapped into the usual circular form after the bridge was almost completed. In this way, expensive staging and working platforms were avoided. The method appears to offer opportunities for economy in the construction of shorter spans.

Specially heat-treated cable wires were used for the Mount Hope Suspension Bridge (1200 feet in span), which connects the mainland of Rhode Island with the island on which Newport is located, and also for the Detroit-Windsor International Bridge, already mentioned as a span of 1850 feet. This treatment was expected to have little influence on the ultimate strength of the wire but has shown a marked effect in increasing the elastic limit, or yield point, and thus permits higher working stresses. In these wire cables, difficulties in construction were experienced in 1929 leading to replacements of material.

**Steel Arches.** The jump from the ancestor of modern steel arches, Captain Ead's famous St. Louis arch (1868-74, 520-ft. span) which recently has been checked up and reported safe for present traffic, to Gustav Lindenthal's great Hell Gate arch (practically a 1000-ft. span) across the East River at New York in 1917, represented an increase in span of almost 100 per cent and an even greater load increase. Yet, there is under construction at Sydney, Australia, an arch 1650 feet in span and the Kill van Kull arch now being built at Bayonne, N. J., by the Port Authority of New York, will have a span of 1675 feet. While these later bridges will carry highway and rapid-transit loads far less than the heavy railroad loads at Hell Gate, this later bridge appears to have served as the inspiration for these great new arches as well as for some smaller arches now completed. For example, the Newcastle-Gateshead arch opened

in England in 1928 is of the Hell Gate type with massive piers built largely to satisfy aesthetic requirements.

This treatment of arch construction is, of course, largely limited to locations where there are comparatively low approaches. Among the steel-arch bridges in surroundings where steep side walls make the arch particularly appropriate, is the new Lee's Ferry arch (1928) across the canyon of the Colorado some 130 miles north of Flagstaff, Ariz. The nearest railroad being located at Flagstaff, all material had to be brought to the site by motor truck. Furthermore, there was no means of transportation to the opposite side of the canyon. While not a great span, judged by modern standards (616 feet), this construction, so far from a railroad, is of considerable interest. Half the bridge was cantilevered out from the canyon wall, 467 feet above the river, a temporary cableway closed the gap and enabled the workers to transfer the necessary material to the far side of the canyon so that the other half of the arch could be built out to meet the portion first erected.

An interesting railroad arch, probably the most important of this type since the Hell Gate arch, was completed early in 1925 for the Michigan Central Railroad over the Niagara Gorge. It is located between the older highway arch and the railroad cantilever, and is a double-track, ballasted-floor structure with a main span of 640 feet crossing the deep gorge high above the Whirlpool Rapids.

**Cantilever Bridges.** Undoubtedly, the most important cantilever bridge record of the period since 1914 was the final successful completion of the Great Quebec cantilever in 1917. The first attempt to build this ill-fated structure failed with great loss of life in 1907. The new design with a main span consisting of two cantilever arms of about 600 feet and a span of the same length suspended between the ends of these arms, was completed except for this central span in 1910. The suspended span was erected on floats, floated to position beneath the bridge, and a start had been made in lifting it into position when one of the temporary bearings gave way and the entire mass of steel disappeared beneath the deep waters of the St. Lawrence. Another span was made and was hoisted into position by the same method in 1917, thus finishing the bridge—the longest cantilever span in the world—and vindicating the engineering profession in the eyes of a public which had begun to think that engineers had at last tackled a problem beyond their abilities.

While the great cantilevers of the past have been railroad bridges, this type also has been brought forward in the highway field by the rapid development of motor transportation. The second largest cantilever in America and the fourth largest in the world (Quebec, Forth, and Blackwell's Island exceed it in span) was completed in 1927 and is a privately owned toll bridge crossing an arm of San Francisco Bay. The Carquinez Straits Bridge consists of two spans of 1100 feet with a central pier and anchor arms of 500 feet each—in general arrangement thus resembling the Forth Bridge. In construction, it sets no new records for the sizes of its members, as it carries a lighter load than some of the older railroad spans, but its foundations are of special interest, for they were dredged down to 132 feet below water level.

Some other smaller cantilever highway spans

also are notable. One of these is the Snake River cantilever, a light highway toll bridge crossing the Snake Canyon in Idaho, and the two cantilevers over Arthur Kill in New York, built by the Port of New York Authority. The former has a span of 700 feet and is probably the highest bridge in the world, as it is 502 feet above stream bed. The latter two bridges connect the main land of New Jersey with Staten Island and have spans of about 750 feet with long inclined approaches necessitated by the clearance of 135 feet above the water surface required by the War Department.

The cantilever bridge, a type which has until recently held the span record of the world, has thus also found a place in the new era of bridge building—the highway era.

**Truss Bridges.** While the suspension, arch, and cantilever occupied the spectacular position in bridge development, the simple truss continued to fill the requirements for moderate spans and probably thousands of these bridges were built in forms which have become more or less standardized. An outstanding truss bridge is the Castleton or Smith Bridge over the Hudson below Albany built by the New York Central Railroad as part of its plan to relieve freight congestion in Albany by constructing a by-pass route for through freight trains. Topography unfortunately dictated an unsymmetrical arrangement of spans at Castleton and the bridge, a most imposing structure in scale, thus is far from pleasing aesthetically. This is a double-track through-truss bridge with high steel viaduct deck approaches leading to the two simple, inclined upper chord truss spans. The east span is 400 feet and the main channel, or west span, 600 feet. These rest on three high stone-faced concrete piers giving a channel clearance of 135 feet. The 400-ft. span was erected first and the 600-ft. span was built out part way by cantilevering from the smaller span using temporary back stays. High steel bents were then erected on temporary pile foundations in the river bottom, giving intermediate support, and the cantilever scheme was then continued until the span was closed. The maximum overhang during erection was 270 feet. This ingenious scheme of erection saved the necessity for a very high and costly falsework, such as would have been used in earlier days of truss-bridge erection, and is one of the most interesting recent construction developments.

One of the longest, if not the longest, simple truss spans in the world is that of the Metropolis Bridge over the Ohio River on a new line of the Chicago, Burlington & Quincy Railroad. This bridge, finished early in 1917, consists of four simple truss spans of about 555 feet and one of 720 feet. It is a two-track structure and was erected on falsework and by derrick rather than by the usual traveler. The huge main truss is 110 feet in height, and eyebars 72 feet long were used.

Another truss bridge, also finished in the same year, is that at Sciotoville over the Ohio River. This bridge appears to hold the record for continuous truss spans, having two spans of 775 feet continuous over the centre pier. One span was erected on falsework, but the span over the main channel was cantilevered out for 465 feet to a temporary support and then continued by cantilevering to closure. Other important continuous truss spans, built a year or two later, were the Allegheny River Bridge near Pitts-



burgh (three of 272, 520, and 347 feet, and three of 347, 350, and 272 feet), and the Hudson Bay Railroad Bridge at Kettle Rapids in the Nelson River with three continuous spans of 300, 400, and 300 feet.

It is clear, from these examples, that even the simple truss is still growing in span length and is holding its own as an economical type of railroad bridge for spans which a few years ago would perhaps have been crossed by cantilevers of a size which would have been considered notable. The use of continuous trusses also shows that American engineers are taking advantage of this type, a form which, although economical, has been more or less studiously avoided because of uncertainties of foundations or of stress.

**Bascule and Lift Bridges.** The bascule bridge in its various types, of which there are several, continued in vogue, during the period under consideration, both for railway and highway bridges. The most notable designs of bascule bridges were the Rall type and the Scherzer type. The length of span and capacities of bascule bridges were increased, and in many cases they were considered preferable to swing bridges for crossing narrow waterways where there was considerable traffic, and thus avoiding a central pier such as is required for swing bridges. This type of bridge was extensively employed in Chicago, and there in 1923, 22 simple trunnion bridges were in use. Two of these were built with double decks and that across the Chicago River at Wells Street, completed in 1921, had a span of 268 feet centre to centre of trunnions, affording a clear channel width of 220 feet. Each leaf of this bridge is carried by two trunnions and weighs 2500 tons, of which 1300 tons is counterweight. Besides being used in Chicago, these bridges found extensive use across the water-ways of Seattle.

Lift bridges also have been in favor for the longer spans where a full channel width and high clearance were essential. Two important works of this type are the James River Highway Bridge, completed in 1928, with a central lift span of 300 feet, and the double-deck, railroad-highway lift over the Kennebec at Bath, Me., span of 234 feet, opened late in 1927. The three-track lift bridge of 198 feet, recently completed (1928) by the Lackawanna Railroad at the Hackensack River crossing near Jersey City, is another notable example of this type of construction.

**Concrete Bridges.** It is difficult to realize today, when concrete is so widely used, that reinforced concrete is a very recent structural material. In America, the first generally accepted theory of reinforced concrete design was published as the joint effort of the several national engineering societies in 1912. Before 1900 the bulk of Portland cement used in the United States had been imported from abroad. By 1900 America was manufacturing about 10 million barrels a year, in response to a rapid increase in demand which began about 1895. By 1920 this American production had reached 100 million barrels annually in spite of a bad setback on account of the War, and continued to climb, reaching about 175 million in 1928. When we realize that even in the period from 1914 to date the American cement industry has practically doubled in output, and that this is a fair index of the growth in concrete construction, it becomes clear that justice cannot be done to this type of construction in a brief article

such as this. It is only possible to select a few of the leading developments.

The most notable concrete work of the war period, at least in magnitude, was undoubtedly the great railroad viaduct construction on the Lackawanna Railroad. Increase in traffic on this road justified several important improvements in grade and alignment which would effect worth-while reductions in operating expenses. These changes involved several great viaducts of which the Tunkhannock is the largest. Begun in 1912, before the great increase in prices brought about by the War, it was completed in 1915—a huge, massive concrete bridge over half a mile long, consisting of ten arches of 180-ft. span, and higher than a twenty-story building (240 feet). Its design involved some very interesting economic problems of span and of arch and pier proportions. Its appearance makes it one of the most impressive works of man ever undertaken. It is doubtful if it will be duplicated in the near future, for increased costs of cement and concrete would make a steel structure far more economical—indeed even when it was built, steel although less permanent would have cost less.

While the Tunkhannock arches are practically solid ribs of the voussior type inherited from stone-arch days, the development of the elastic arch or arched rib of reinforced concrete has been largely a European contribution in concrete-bridge design. Continental engineers with superior technical training in the mathematics of design and theory and facing an economic situation in which labor was comparatively cheap and material costly, the reverse of American conditions, naturally turned for economy to those refinements in design whereby materials may be conserved. The records for light and graceful concrete arched ribs, frequently hinged, have rested in Europe.

The three-hinged Grünwald arch opened late in 1904 near Munich, Bavaria, with its two record-breaking spans of 230 feet each, set a mark that has since been exceeded by almost 100 per cent. The greatest concrete-arch spans in Great Britain are those of the Royal Tweed Bridge opened in 1928. This work carries the Great North Road to Edinburgh across the Tweed in four main spans varying from 248 to a maximum of 361½ feet. On the continent the greatest span is that of the Pierre du Vauvray Bridge of 432 feet, over the Seine near Ande, opened in 1924. The same engineer, M. Freysinet has proposed a three-span concrete bridge to carry both railroad and highway traffic across the River Elorn in Brittany, near Brest, the Plougastel Bridge. The spans were set at 613.36, 639.6, and 672.4 feet each, centre to centre of piers, with a clearance at centre of 118 feet above the river level. This work, as far as known, is still held up on account of lack of funds. As proposed, it has been exceeded in daring only by the plans made in 1907 for a Hudson-Fulton Memorial Bridge of 700 feet in span at New York—a work also awaiting finances.

France also claims the record plain concrete-arch span in the Pont de la Caille, near Cruseilles (Haute Savoie), a hollow arch of 139.8 m (458.5 feet). A span of 236.3 feet, replacing a steel structure over the Piave, near Belluno, and completed in 1926 is the boldest concrete arch in Italy.

While early American arches generally followed the voussior type, American engineers

gradually adopted European methods of design and used the open spandrel, independent rib type of arch where it met American economic demands. Hinged arches have not in general been favored and construction has naturally followed more solid and substantial lines. Spans of 200 to 300 feet have been common, however, and hundreds of concrete highway arches and viaducts have been built in America in response to the demands of motor transportation. The three spans of 300 feet each, completed across the Mississippi in 1927 joining St. Paul and Minneapolis, are typical of the many works of this kind built in America. Another recent and large American bridge of reinforced concrete is that crossing the Minnesota River between Fort Snelling and Mendota, Minn. It is 4119 feet long and consists of twelve spans of 304 feet each. American war memorials have frequently taken the form of bridges and, in these monumental structures, concrete usually plays a large part. The longest span in America is still that of the Cappelen Memorial Arch at Minneapolis (400 feet) erected in 1923.

M. Freyssinet, already mentioned as the foremost of French concrete-arch experts, estimates that a maximum span of 1115 feet may be secured for plain concrete arches, and 2723 feet for reinforced concrete arches, without any special difficulties. Engineers look forward with great interest to this development. The problem of secondary stresses due to temperature, etc. in these great spans is being solved abroad by hinges of various kinds and it would appear that the record constructions of this type would be built in Europe unless American engineers look with more favor on hinged arches, a type of construction which has been studiously avoided in America, and unless American labor and material costs for concrete work show better economy than they do at present.

Another interesting development in reinforced concrete design, originating in Europe just before the World War, is rigid frame construction. In its simplest form as applied to bridges, this may be roughly described as a construction in which the two side supports and the beam spanning the opening between them, are made in one unit—there is no joint at the top of the posts and the entire section is continuous. An arch span requires heavy abutments to take up the inclined arch thrust. The rigid frame has simple footings of the usual building type. The result is a marked economy in cost of construction and these designs, which were first used in the main traffic-parkway arteries from New York northward being built by the Bronx and Westchester Parkways Commissions, were hailed by such a conservative and reliable journal as the *Engineering News-Record* as "results so impressive in increased efficiency and æsthetic range as to forecast an important influence on short-span practice."

The first of these bridges built in 1922 had a span of 41 feet. It has become the principal type of this commission and spans of as much as 70 feet show its economy even over the unsightly plate girder type of span.

While there have been some adoptions of this form by State highway commissions and railroads, it would appear that this movement has been discouraged by the apparent complexity of the computations for this type of structure. As so often happens, however, this problem of design has been met most effectively by one of

the most important developments in many years in the field of structural analysis. The "deformeter" apparatus, designed and perfected by an American engineer, G. E. Beggs, professor of civil engineering at Princeton, has not only proved a labor-saving device in the analysis of continuous design and a means of checking the elaborate theories which have been built up in the mathematical attack on this problem, but has also given invaluable data on the mechanical behavior of other mechanically complicated forms for which analysis has been lacking. In a rough way, the apparatus may be described as giving an accurate means of measuring by special scales, micrometer microscopes, etc., the deflections of small celluloid or bristol-board models. From the law known as "Maxwell's law of reciprocal deflections," the stresses under assumed load conditions are then computed. Perhaps one of the most interesting bridge applications, outside that already mentioned, is in the analysis of the skew arch—a form long imperfectly understood and hence generally avoided even where topography would favor its use.

**Bibliography.** The literature of engineering has so rapidly increased during the period under discussion that it is almost impossible to give an adequate bibliography even of new works in a single field. In bridge engineering, the three volumes of *Theory and Practice of Modern Framed Structures*, by Prof. J. B. Johnson, rewritten by C. W. Bryan and F. E. Turneaure, still stands as a fundamental text. (Latest ed., 1926). The structural series by G. A. Hool and W. S. Kinne is probably the most notable of recent American publications in this field: *Foundations, etc.* (1923); *Structural Members and Connections* (1923); *Stresses in Framed Structures* (1924); *Steel and Timber Structures* (1924); *Reinforced Concrete and Masonry Structures* (1924); and *Movable and Long Span Steel Bridges* (1923). *Bridge Engineering* (1916), by the veteran American engineer J. A. L. Waddell, should also be mentioned, as well as the important two-volume work on *Movable Bridges*, by O. E. Hovey (1926). In 1929 there appeared a second edition of *A Practical Treatise on Suspension Bridges*, by D. B. Steinman, New York, and Volume III, *Bridges and Culverts of Reinforced Concrete Construction*, second edition (New York, edited by George A. Hool.)

**BRIDGES, CALVIN BLACKMAN** (1889– ). An American biologist, born at Schuylers Falls, N. Y., and educated at Columbia University. He was research assistant in genetics to Professor Morgan (1910–19) and member of the research staff in genetics of the Carnegie Institution of Washington (1919– ). He published numerous papers on genetics and was co-author of *Mechanism of Mendelian Heredity*, with Muller, Morgan, and Sturtevant (2d. ed., 1923). He was also the author of *Genetics of Drosophila* (1923).

**BRIDGES, ROBERT** (1844– ). An English poet laureate (see Vol. III). In 1923–24 he held the Honorary Fellowship in Creative Arts, University of Michigan. He also received the Order of Merit in 1929 and honorary degrees from Oxford, Saint Andrews, and Harvard. He published *The Spirit of Man: Anthology in English and French* (1916), *Yattendon Hymnal, Ibsen Obscure* (1917), *Britannia Victima* (1919), *October and Other Poems* (1920), *The Childswell Book of English Poetry* (1924), and *New Verse* (1925).

**BRIDGES-ADAMS, W.** (1889- ). A British stage director, educated at Oxford. He was part manager and producer for the Bristol Repertory Theatre, 1914-15, and in 1916-17 manager and producer for the Liverpool Repertory Theatre, which he renamed the Playhouse. In 1919 he undertook the direction of the Stratford-on-Avon Shakespearean Festivals and founded and organized the New Shakespeare Company under the auspices of a joint committee of the Shakespeare Memorial National Theatre and the governors of the Memorial Theatre, Stratford-on-Avon. In 1922 he produced a Shakespearean season at the National Theatre at Christiania, Norway.

**BRIDGMAN, PERCY WILLIAMS** (1882- ). An American physicist, born at Cambridge, Mass., and educated at Harvard. Receiving a fellowship, he continued his scientific studies at Harvard and also served as an instructor in physics, of which department he was made full professor in 1919 and given the directorship of the Jefferson laboratory. Since 1926 he has been Hollis professor of mathematics and natural philosophy. His researches have included important studies on various topics in mechanical physics, such as measurements of high hydrostatic pressure, and in physical chemistry, such as change of phase under pressure and modifications of phosphorus. He is the author of *The Logic of Modern Physics* (1927).

**BRIEUX, bré'e', EUGÈNE** (1858- ). A French dramatist (see Vol. III). His later works include *Le Bourgeois aux Champs* (1914); *Au Japon par Java* (1914); *Les Américains Chez Nous* (1920); *Trois bons amis* (1921); *L'avocat* (1922); *L'enfant* (1923), and *La famille Lavolette* (1926). Consult *The Plays of Eugène Brieux*, by P. V. Thomas (1915) and *Brieux and Contemporary French Society*, by William H. Scheffey (1917).

**BRIGADE.** See **ARMIES AND ARMY ORGANIZATION.**

**BRIGGS, CLARE A.** (1875- ). An American cartoonist. He was born at Reedsburg, Wis., studied at the University of Nebraska (1894-96), and began work as a newspaper artist on the St. Louis *Globe-Democrat* in 1896. He later went to the St. Louis *Chronicle* and turned to cartoon-drawing when the development of the half-tone process made the old methods of general illustrating in newspapers obsolete. Going to New York, he joined the staff of the *World* (1898-99) and later the *New York Journal*, and *Chicago Examiner* and *American*. He then went to the *Chicago Tribune* (1907-14) and has been with the *New York Tribune* Syndicate since 1914. His work has been chiefly in the social, rather than the political field. He was the creator of "Skin-nay," "The Days of Real Sport," "When a Feller Needs a Friend," "Ain't It a Grand and Glorious Feeling," "Somebody is Always Taking the Joy Out of Life," "How to Start the Day Wrong," "There's at Least One in Every Office," "A Handy Man Around the House," "That Guiltiest Feeling," and other reflections of the homely and intimate experiences of life. The human touch has made his drawings read daily in millions of American homes for more than a decade. He wrote *How to Draw Cartoons* (1926).

**BRIGHAM YOUNG UNIVERSITY.** A co-educational institution at Provo, Utah, under the auspices of the Church of Jesus Christ of

Latter Day Saints; founded in 1875. The regular college enrollment increased from 650 in 1913 to 1250 in the autumn of 1928; summer-school registration reached 396 in 1928; the faculty was increased from 30 to 98 members; and the library from 600 to 60,000. The budget for the year 1928 was \$338,000. Developments at the University during the period under review included: The construction of the first unit of the Heber J. Grant Library building in 1925; improvements in landscaping the grounds; the enlargement of the Alpine summer school on Mt. Timpanogos, in 1925, for facilities for more students in the natural sciences by the addition of several buildings; and the establishment in the same year of departments of zoology, entomology, botany, and bacteriology. In 1928 a new stadium and athletic field were added to the plant. President, Franklin Stewart Harris, Ph.D.

**BRIGHOUSE, HAROLD** (1882- ). An English author and playwright. His recent productions include *The Road to Raebury*, in collaboration with Stanley Houghton (1915); *Hobson's Choice* and *The Clock Goes Round* (1916); *Other Times* and *Three Lancashire Plays* (1920); *Once a Hero* (1922); *The Happy Hangman* (1922); *The Apple Tree* (1923); *Mary's John* (1924); and *What's Bred in the Bone* (1927). His stories include *Fosste for Short*; *The Silver Lining*; *The Marbeck Inn* (1920); *Hepplestalls* (1922); *The Wrong Shadow* (1923); and *Hindle Wakes*, taken from S. Houghton's play (1927).

**BRIGHTMAN, EDGAR SHEFFIELD** (1884- ). An American professor of philosophy, born at Holbrook, Mass., and educated at Brown and Boston universities and at Berlin and Marburg in Germany. He taught successively at Brown University, Wesleyan College (Neb.), and Wesleyan University (Conn.). In 1919 he was called to Boston University as professor of philosophy in the Graduate School. In his philosophy, he is a strong advocate of the religious doctrine of personalism. His works include *The Sources of the Hebraeuch* (1918), *Religious Values and Recent Philosophy* (1921), *An Introduction to Philosophy* (1925), and *Immortality in Post-Kantian Idealism* (1925). He is also a contributor to the projected *Encyclopædia of Protestant Theology*, *The American Journal of Theology*, *The Journal of Religion*, and other periodicals.

**BRIGHT'S DISEASE.** See **NEPHRITIS.**

**BRILL, GEORGE MACKENZIE** (1866- ). An American mechanical engineer, born at Poughquag, N. Y., and educated at Cornell University. In 1897-1900 he was chief engineer for Swift & Co., Chicago. He was chairman of the jury of awards on general machinery at the Panama-Pacific Exposition in 1915 and during the World War was in the Ordnance Department with the rank of major. He served also as chief of the requirement section of the Emergency Fleet Corporation in 1918. Since 1919 he has been a consulting engineer in New York City.

**BRILL, NATHAN EDWIN** (1865-1925). An American physician, born in New York and educated at the College of the City of New York and the University of New York. He was physician to Mt. Sinai Hospital, 1891-1925, and clinical professor of medicine at Columbia, 1910-25. In 1917 he was made a major of the medical officers' reserve corps and director of Base Hospital No. 3 in France. In 1910 he discovered an

endemic, non-contagious form of typhus fever which had evidently prevailed in New York City at intervals for many years, thereafter known as Brill's disease. He contributed much to periodical medical literature on this and numerous other subjects and in 1898 translated Klemperer's book on physical diagnosis under the title *Clinical Diagnosis*.

**BRINTON, CHRISTIAN** (1870- ). An American art critic, born at West Chester, Pa., and educated at Haverford College, the universities of Heidelberg and Paris, and the École du Louvre. Among his works on art are *Modern Artists* (1908), *Masterpieces of American Painting* (1910), *Impressions of Art at the Panama-Pacific Exposition* (1916), *Introduction to the History of Scandinavian Art* (1921), and many catalogues and contributions to leading magazines and art reviews. He also contributed to the *Iconographic Dictionary of Art*. Christian Brinton was decorated by King Gustav V of Sweden in 1917 and in 1915 was made advisory editor of *Art in America*.

**BRISBANE, ARTHUR** (1864- ). An American newspaper editor (see VOL. III). He bought the *Washington Times* in 1917 and the *Evening Wisconsin* in 1918. Both of these he sold to William Randolph Hearst in the following year. In 1918 he became editor of the *Chicago Herald and Examiner*. He resigned from the editorship of the *New York Evening Journal* in 1921, but continued to write editorials for the Hearst newspapers.

**BRISTOL.** An important seaport and manufacturing city of England. The population at the census of 1921 was 370,975; in 1927 it was estimated to be 385,700. The municipal area is 18,700 acres. To enable Bristol to retain its title as a first-class port, great additions have been made to the equipment and storage facilities of the port at a cost of £1,250,000. The most important of these is the extension of the Royal Edward Dock at Avonmouth, which was opened by the Prince of Wales on May 23, 1928. The eastern arm of the dock, which forms the main part of the new works, has a water area of more than 15 acres and contains 3600 lineal feet of quays. Equipment and storage facilities include reinforced concrete wharf structures, transit sheds, and grain handling appliances. The net tonnage of ships engaged in foreign trade that entered the port in 1927 was 2,153,573, the tonnage of those cleared was 1,337,880; the value of sea-borne trade in 1926 was £36,510,724. A new low, level road, nearly 5 miles long, has been constructed between the city and the docks at Avonmouth at a cost of about £800,000, replacing an old narrow highway which contained steep gradients and bad corners. The work involved the construction of large retaining walls and river walls and the construction of bridges, one of which is more than 100 yards long and is carried on six spans owing to the treacherous nature of the subsoil. Bristol has been especially active in the matter of housing since the War. In 1919 a shortage of 10,000 houses was estimated; since then, more than 5000 houses have been erected through the efforts of the corporation and private enterprise. To cope with the slum problem, the corporation has also provided a number of three-story flats. Recent important acquisitions of the City are Colston Hall, one of the largest halls in England and capable of seating 4000 persons, and Blaise Castle, a fine estate of 200 acres on which play-

ing fields are to be established. In connection with its health services, the corporation utilizes an estate of 70 acres, purchased in 1921, which is to be developed into a complete orthopaedic establishment.

**BRISTOL, MARK LAMBERT** (1868- ). An American naval officer, born in Glassboro, N. J. He graduated from the United States Naval Academy in 1887 and was commissioned an ensign in 1890, a captain in 1913, and a temporary rear admiral in 1918. He made a special study of gunnery, torpedoes, and air craft and from 1913 to 1916 was in charge of the development of aeronautics for the Navy. In 1918-19 he commanded the United States Naval Base at Plymouth, England. He was a member of the International Armistice Commission in Belgium in 1918, and in the following year commanded the United States Naval Forces in Turkey. He served as high commissioner to Turkey in 1919-20 and was a member of the International Commission of Inquiry in the Greek occupation of Smyrna, in 1919. He had general charge of American interests in Asia Minor during the Greco-Turkish campaign of 1922 and did efficient service after the destruction of Smyrna in relief of refugees and protection of American interests, 1922-23. He was one of the American delegates to the Lausanne Conference, 1922-23. Later he was commander-in-chief of the United States Asiatic Fleet.

**BRITISH COLUMBIA.** A Canadian province on the Pacific coast. Area, 355,855 square miles; population in 1911, 392,480; in 1921, 524,582. In 1921 the urban population numbered 247,562 and the rural 277,020. The rural thus comprised 52.8 per cent of the population, which was a gain over the 48.1 per cent of 1911. The estimated population in 1929 was 591,000. Chinese immigration was restricted by a head tax, while Japanese and Hindu immigrants were regulated by diplomatic arrangements. Vancouver, the largest city, had a population in 1921 of 117,217 (100,401 in 1911); Victoria, the capital, had 38,727 (31,000 in 1911); New Westminster, 14,495 (13,190 in 1911). By 1927 enrollment in elementary and secondary schools had increased to 105,008 (44,945 in 1911). The educational system also includes 73 high schools, several normal schools, and the provincial university. Total expenditures for education in 1911, \$2,641,522; in 1927, \$8,311,620.

**Industry.** Only a small proportion of the country is under crops. Intensive agriculture is the rule, the leading activities centering in fruit raising, hop growing, stock raising, and the cultivation of root crops. Oats are the most important field crop. Recent developments were the increasing attention given to barnyard animals (poultry, swine, etc.), and dairy products. Agricultural production in 1927 was valued at \$76,999,269. Lumbering, pulpwood, etc., ranked first among the industries. In 1926 the value of products was \$84,802,000. (Of this, the pulpwood and newsprint produced were valued at \$16,315,000. The woods most sought after are Douglas fir and white spruce. The mineral production of the province ranked second only to that of Nova Scotia. In 1928, the total value of minerals was \$65,372,583 as compared with \$32,440,800 in 1912. Gold, in 1928, yielded \$4,031,305; silver, \$6,182,461; coal, \$12,633,510; lead, \$13,061,412; and copper, \$14,265,242. The undeveloped coal fields are particularly rich. The local fisheries rank next in importance, the

1927 catch being valued at \$23,227,004. The leading commercial fish are salmon, halibut, cod, sturgeon, smelts, sardines, and herring. The seal industry is economically terminated, as only natives are permitted to participate in it. About \$32,000,000 is invested in the fishing industry. In 1927, there were in all, 8243 industrial establishments, mainly concerned with the lumber and fish industries, that represented a capital of \$251,051,877 (1926). Employees totaled 111,812, wages, \$175,173,836; and value added by manufacture, \$91,788,000. The total available water power in the province is estimated at over 1,931,142 h.p.; of this, 473,142 had been developed by the end of 1927 and 465,000 additional horse power was under way.

**Trade and Communications.** In 1926 there were 5144 miles of railway in the province as compared with 1855 in 1912. Ocean-going steamboats and coastwise vessels are operated by the Canadian Pacific Railway. Communications are regularly maintained between Vancouver and Prince Rupert. The Panama Canal is being utilized to bring Canadian Pacific and Atlantic ports into closer touch. In 1925-26, 9589 vessels of 10,242,972 tons entered in the sea-going trade and 9954 of 10,766,338 tons cleared. In the coastwise trade, 35,407 vessels of 15,316,176 tons entered and 35,310 of 15,195,702 cleared. The trade of the province has increased considerably. In 1912 exports and imports were valued at \$20,272,840 and \$49,345,161; by 1926 these were \$192,457,737 and \$73,510,348. Exports consist of minerals (gold, silver, copper, coal), sea products (salmon, halibut, herrings, whale products, and oil), lumber, furs, skins, etc. Fruit is shipped in large quantities to the Canadian prairie provinces. During the year ending Mar. 31, 1929, imports for consumption of the Province of British Columbia were valued at \$10,243,232; the Canadian exports amounted to \$31,290,257, and the foreign exports to \$105,139.

**Government.** The province's representation in the Canadian Parliament is 6 in the Senate and 14 in the House of Commons. Revenues for 1926-27 were \$20,258,915 (\$10,479,259 in 1913-14); expenditures for 1926-27 were \$17,846,690 (\$15,762,912 in 1913-14). Women have been granted the ballot.

**BRITISH EAST AFRICA.** A British possession covering a large area of Africa, and comprising KENYA COLONY, UGANDA PROTECTORATE, and ZANZIBAR. See these articles.

**BRITISH EMPIRE.** The purpose of this article is to deal with general matters concerning the British Empire as a whole, the affairs of Great Britain, Ireland, and the several colonies being set forth elsewhere in separate articles, to which the reader is referred for details. Much to the chagrin of its enemies, the British Empire failed to disintegrate, on the outbreak of war in 1914, under pressure of the secessionist forces upon which German imperialists had so confidently counted. Only in South Africa were the German hopes of an anti-imperial rebellion measurably gratified, and even there, the insurrection led by Boer irreconcilables (Maritz, de Wet, Beyers, and Kemp), in October, 1914, was speedily crushed by Boer loyalists, Premier Botha and Defense Minister Smuts. Conspiracies in India and elsewhere were only flashes in the pan. The Turkish Sultan's proclamation of a Holy War failed to move the Moslem masses in British possessions. The Empire held together. Moreover, the self-governing dominions

came to the mother country's aid with an enthusiastic loyalty few had ventured to anticipate. Canada enlisted 595,441 men and sent 432,642 of them to fight overseas; Australia sent 329,682; New Zealand raised an army of 124,211 and sent 100,444 soldiers and nurses to distant battle fronts; South Africa mustered 146,515 men, of whom 30,000 were used in Europe and 43,000 in East Africa, besides conquering German Southwest Africa and raising a force of 85,000 colored troops and military laborers. India, instead of rebelling, supplied 1,679,416 men, to be drawn on for battles in France, on Gallipoli, in East Africa, while the British garrison in India was at one time reduced to as few as 15,000 men. Altogether, the dominions, colonies, and India contributed 3,284,943 men, of whom 202,321 were killed and 428,644 wounded, to defend the empire to which they belonged.

The War not only demonstrated the strength but also enlarged the territorial extent of the Empire. Cyprus, occupied since 1878, and Egypt, occupied since 1882, were declared British protectorates shortly after Turkey entered the conflict in 1914, and were definitely ceded by the latter in the Treaties of Sèvres (1920) and Lausanne (1923), along with Palestine and Mesopotamia over which Great Britain became mandatory power, together with the connecting Arabian hinterlands. The former Turkish province of Hedjaz, having declared independence at British prompting during the War, became a veiled protectorate, whose nominally independent King accepted a subsidy and advice from Britain. All except the northwestern corner of German East Africa, a thin slice of the Cameroons, somewhat less than half of Togoland, and the island of Nauru, became British mandates as a result of the peace settlement; but to these should be added the Australian mandate over German New Guinea (Kaiser Wilhelm's Land and Bismarck Archipelago), the New Zealand mandate over German Samoa, and the South African mandate over German Southwest Africa. The mandates gained by Britain and her dominions added 884,500 square miles to the Empire, and if one includes Egypt, Cyprus, and Hedjaz, the total territorial accretion was about 1,300,000 square miles. At the close of the world conflict, the Empire embraced over 2,000,000 square miles and 330,000,000 persons in Asia; over 4,000,000 square miles and 63,000,000 persons in Africa; 4,000,000 square miles and 11,000,000 inhabitants in America; and 3,250,000 square miles and almost 8,000,000 persons in Australasia: a grand total of more than 13,000,000 square miles and nearly half a billion human beings.

So huge an empire proved, in years after the War, to be not an unmixed blessing. Cyprus, the mandates, and several older colonies, presented the harassed taxpayers of England with unwelcome annual deficits to be paid, while the maintenance of occupying forces in Mesopotamia, Persia, and elsewhere was almost incredibly expensive. Moreover, the awakened nationalism of backward races strengthened the tendency toward which the need of financial retrenchment pointed. Instead of meeting native demands with bullet and bayonet, Great Britain granted conditional independence to Egypt and to Mesopotamia in 1922, withdrew from Persia and Baku, in 1920-21, acquiesced in Afghanistan's reassertion of independence in 1921, and by the Government of India Act of 1919, accorded incomplete satisfaction to the Indian aspiration for *swaraj*.



Different in motive, but similar in the tendency to diminish rather than expand the Empire's holdings, were the cession to Italy after the War of the Jarabaih strip on the West-Egyptian frontier and of Jubaland (from Northeastern Kenya), and the promise at the Washington Conference to restore Wei-hai-wei to China if the other powers would also surrender their leaseholds.

The most significant political development in the Empire during and after the War was the definite assumption by the dominions of a new status. For a long while before the War, their steady growth had been taking them farther and farther away from the position of subject colonies. The thorough-going manner in which they rallied to the defense of England in the War and the magnitude of their sacrifices gave them a claim to greater autonomy, which could not be ignored. During the War, this claim was recognized by the establishment (in 1917 and 1918) of an Imperial War Cabinet and an Imperial War Conference, in which the United Kingdom, India, and each dominion was represented on an entirely equal basis. These bodies had only advisory, and no administrative, powers. At the Peace Conference, the dominions and India insisted upon and finally obtained the right to be represented by their own delegations. When the League of Nations was constituted, they demanded separate membership, and as finally worked out their status within the League became practically that of independent nations.

Following the War, the relations between the dominions and Great Britain were marked by a continued effort on the part of the former to act on the presumption that full autonomy was to be taken for granted, and on the part of the British authorities a more or less reluctant yielding of ground. Until 1926, however, there can hardly be said to have been a clearcut official definition of the new relations, which indeed will probably continue to include some ambiguous points as long as the Empire holds together. The personal influence of the South African General Smuts was largely responsible for the Downing Street policy of placating rather than resisting the desire for autonomy.

The Imperial Conference of 1921 brought no change in the constitutional status quo, although it did lead to the adoption of a uniform policy with regard to the proposed renewal of the Anglo-Japanese Alliance—which Canada opposed—and prepared the way for the Washington Conference. In 1921 the Irish Treaty was signed and through it certain advances that had been made toward autonomy for the parts of the Empire were brought to the point of formal acknowledgment. The Irish Free State took on dominion status. The treaty provision that the new state was not to be involved in actual war (except in case of invasion) without the consent of its own Parliament was later accepted by the British government as applying to all the dominions. In this treaty also the term "Commonwealth of Nations" was adopted in place of "Empire."

The question of the degree of independence to be enjoyed by the dominions came more definitely to the front in connection with their relations with foreign countries. In 1923 Canada successfully contended for the right to sign a treaty with the United States relating to halibut fisheries without the cosignature of a British representative, and the action was considered in some quar-

ters as establishing a precedent. Later in 1923, at the Imperial Conference held in London in that year, the principle involved was formally sanctioned by the conference action in declaring that each dominion was to have the right of concluding independent treaties on subjects which concerned itself alone. The conference also agreed that the dominions and India were to be represented on any delegation to a conference for the negotiation of international treaties by the Empire. As a result of discussions at the conference and later, it was definitely established that the dominions would incur no active obligations under a treaty unless they had formally ratified it themselves.

The whole subject of inter-imperial relations came to a head in the important Imperial Conference of 1926. It was opened on October 19, and was attended by the Prime Ministers of Canada, Australia, New Zealand, South Africa, and Newfoundland, by the President and Foreign Minister of the Irish Free State, and by representatives of India and Great Britain. The Committee on Inter-Imperial Relations headed by Lord Balfour went thoroughly into the chief phases of the subject and made a report, on November 19, which was accepted by the conference. The report deprecated the laying down of a constitution for the Empire which, it said, "considered as a whole, defies classification and bears no real resemblance to any other political organization which now exists or has ever yet been tried." But it did set forth in definite terms the root principle of association of the various parts of the Empire, defining their status in the following explicit terms: "They are autonomous Communities within the British Empire, equal in status, in no way subordinate one to another in any aspect of their domestic or internal affairs, though united by a common allegiance to the Crown, and freely associated as members of the British Commonwealth of Nations."

While this seemed to settle the question of status (although it did not specifically mention foreign relations) it was recognized that, in the actual conduct of imperial affairs, the principles of equality and similarity would "not universally extend to function." Various changes in existing detailed practices were recommended. With regard to foreign relations, it was frankly recognized that the chief responsibility must continue to rest with Great Britain, but that the governing consideration must be that neither Great Britain nor the dominions could be committed to the acceptance of active obligations unless with the definite assent of their own governments. The report recommended the dropping of the title "United Kingdom" as applied to Great Britain and Ireland, and the definition of the position of the governors general of the dominions as representatives of the Crown and not of the British ministry. Another feature of the work of the conference was the stressing of the need for closer communication, particularly by air transport, between the parts of the Empire. The report of the conference was received without criticism by the various dominions and it was the sense of the governments that their relations with Great Britain needed no further defining, although several questions, such for example as the right of secession, were not cleared up. The emergence of the dominions on the international stage as autonomous nations was advanced one more step in 1924 when the Irish

Free State appointed a minister to the United States to attend to purely Irish questions. In 1926 and 1927, Canada and the United States also established direct relations through resident ministers at the respective capitals. A similar right of representation was accorded the other dominions.

**BRITISH HONDURAS.** A British Crown colony in Central America. Area, 8592 square miles; population in 1921, 45,317; estimated in 1926, 48,584. Belize, the chief town, had 12,661 inhabitants in 1921. Agriculture continues to engage the population. The exports in 1926 were valued at \$3,928,790; imports, \$5,065,663. Of the 1926 exports, \$3,208,006 went to the United States; \$245,502, to the United Kingdom and \$206,635, to Canada; of the imports, \$2,375,428 came from the United States; \$858,149, from the United Kingdom; \$612,998, from Mexico, \$539,392 from Canada; and \$284,630, from Guatemala. The imports in 1927 were valued at £1,042,317; exports, £808,393. By 1922-23 revenues and expenditures almost doubled those of 1913-14. For 1922-23 they were: revenue, £234,059; expenditure, £226,114; for 1927-28 they were: revenue, £219,373; expenditure, £242,289. The debt in 1928, was £326,660. The attempts to exploit the forests of the country show little success, for production of cedar, mahogany, and logwood was considerably lower in 1927 than in 1911.

**BRITISH ISLES.** See GREAT BRITAIN.

**BRITISH LABOR PARTY.** See GREAT BRITAIN, under *History*.

**BRITISH NORTH BORNEO.** See STRAITS SETTLEMENTS.

**BRITISH WEST AFRICA.** The general name given to the following British colonies in West Africa; Nigeria (colony and protectorate); Gold Coast (comprising the Gold Coast colony, Ashanti, and the Northern Territories); Sierra Leone (colony and protectorate). See separate articles.

**BRITTON, NATHANIEL LORD (1859- ).** An American botanist (see VOL. III). He resigned as director of the New York Botanical Garden in 1920. Among his later publications are *Flora of Bermuda* (1918); *The Bahama Flora*, with C. F. Millspough (1920); *Monograph of the Cactus Family*, (with J. N. Rose, 1919-20).

**BROAD, CHARLIE DUNBAR (1887- ).** An English professor of philosophy, born in London, and educated at Cambridge, where he achieved high honors as a student of metaphysical and ethical philosophy. He was successively fellow of Trinity College, assistant professor of logic at the University of St. Andrews, lecturer on logic at University College, Dundee, professor of philosophy at the University of Bristol, and University lecturer in moral science at Cambridge. In common with the rest of the so-called Cambridge group, Professor Broad approaches philosophy from the point of view of science. His first work, *Perception, Physics and Reality* (1914), was an attempt to find out what knowledge science gives us about the real world. This investigation is continued in *Scientific Thought* (1923). In both of these, he has expounded a theory of perception involving epistemological dualism. He also wrote *Mind and its Place in Nature* (1925); *The Philosophy of Francis Bacon* (an address delivered at Cambridge on the occasion of the Bacon tercentenary, Oct. 5, 1926); *Sir Isaac Newton* (Annual Master Mind

lecture before the British Academy, London, 1927), and contributed articles to *Mind*, *The Hibbert Journal*, *Proceedings of the Aristotelian Society*, and *International Journal of Ethics*.

**BROADCASTING.** The development of radio broadcasting, since its start about 1920, has had the most phenomenal growth of any American industry. David Sarnoff, vice president of the Radio Corporation of America, in 1929 estimated the radio business of the previous year at \$600,000,000 and the number of receiving sets in the United States at 10,000,000. The total number for the world has been estimated at 20,000,000. The sending out of music, lectures, and other entertainment to be received by the listener free of charge is uniquely an American enterprise. In other countries, the listener is taxed, the money thus raised being used to support the broadcasting activities. In the United States, there are over 600 transmitting stations sending out power varying from a few watts to 50 kilowatts, on frequencies generally lying between 500 and 1500 kilocycles. Many of these stations send out programmes sponsored by a client, who pays for the use of the station, as well as for the artist he engages. The charge for a station depends upon the estimated number of its listeners, being about \$500 per hour for a good station.

Besides the individually operated stations, there are many which normally operate as one element of a chain. Two companies, the National Broadcasting Co. and the Columbia Broadcasting Co., in 1929 controlled these chains from their key stations. From the studio of the key station, the performance is sent out over wires to the others, and the country may be actually covered by the voice of a single speaker. On many occasions the voice of the President of the United States has been heard by radio listeners from coast to coast and from the Gulf of Mexico to the Canadian border. The President's audience actually comprises tens of millions of listeners.

During the political campaign of 1928, the two candidates made comparatively few speeches, yet it seemed likely that practically every citizen of the country heard each of them at least once. This new method of campaigning is quite enlightening for the electorate; it is quite easy to discern the political sincerity of the speaker, when sitting in an easy chair at home, away from the torchlight procession and excited crowds. The importance of this method of a candidate or his supporter putting his case before the voters can be estimated when it is stated that each major political party spent about \$1,000,000 for radio facilities during the 1928 election.

**Receiving Sets.** A great change has taken place during the past few years, in the type of receiving set used by the broadcast listener. Instead of using battery power and head telephones for reception, the modern set uses power from the electric-light socket and is always equipped with a loud-speaking telephone, called the loud speaker. The receiving set always consists of a few (generally three) triodes and associated circuits used for radio frequency amplification. These stages of amplification are generally tuned, giving the set sufficient selectivity to separate stations only a few kilocycles apart. The average good set today amplifies the signal from one to five thousand times (in voltage) before sending it to the detector. After being

reduced to audible frequency by the detector, the signal is further amplified from ten to a thousand times before being supplied to the loud speaker. A good set will deliver from 0.1 to 1.0 watt of undistorted signal to the loud speaker, when the signal picked up in the antenna is a few hundred microvolts. The "output" triode should be of at least 10 watts rating and preferably there should be two of them, arranged in "push-pull" connection, to supply power to the loud speaker.

The loud speakers recently have been greatly improved; when connected to a proper receiving set, they will reproduce with reasonable fidelity all frequencies of the received signal from about 70 to 6000 per second. This range is covered only by the moving coil, or "dynamic" speaker; the older horn type had a much more limited frequency response, from about 200 to 2000 vibrations per second.

**Broadcasting Stations.** Broadcasting stations in the United States are now all controlled by the Government through the Radio Commission. This body specifies the amount of power a station may use and the frequency on which it must operate. The Radio Act of 1928 ordered the commission to allocate the available radio channels equally between the five zones into which the country was divided by the act. Those stations which had been rendering the better service to the listeners were granted powers from 1 to 25 kilowatts, whereas those stations serving local listeners are limited to comparatively low power. In allocating power and frequency, the commission was striving mainly to prevent interference between the different stations. Engineers working with the commission set up the following more or less arbitrary classification of the range of radio stations, according to their power:

Rating of Station	Very good Service	Good Service	Poor Service	Interference Range
50 watts	2 miles	10 miles	100 miles	600 miles
500 "	6 "	30 "	300 "	1,800 "
5,000 "	20 "	100 "	1,000 "	6,000 "
50,000 "	60 "	300 "	2,000 "	.....

See RADIO TELEPHONY.

**BROADCASTING MUSIC.** See MUSIC, Mechanical Reproduction.

**BROCA, (BENJAMIN) AUGUST (1857- )**. A French surgeon who received his medical degree from the University of Paris. His numerous writings include *Traitement des Tumeurs Blanches chez l'Enfant* (1890); *Traité de Thérapeutique Infantile*, with Legendre (1894); *Sur l'Anatomie Chirurgicale et Chirurgie d'Oreille Moyenne*, translated into English (1901); and *Leçons Cliniques de Chirurgie Infantile* (1902). During the World War, Broca produced numerous works on military surgery, *Précis de Médecine Opératoire* (1916); *La Prothèse des Amputés en Chirurgie de Guerre* (1917); *Les Séquelles Ostéo-articulaires des Plaies de Guerre*, translated into English (1916); *Ligations et Amputations*, English translation (1917); *Chirurgie de Guerre et Après-guerre* (1921); and *Tuberculose chirurgicale* (1925).

**BROCK, REGINALD WALTER (1874- )**. A Canadian geologist, born at Perth, Ont. He studied at Toronto University, the School of Mining, Kingston, Canada, and Heidelberg. In 1897 he entered the service of the Geological Survey of Canada, of which he was director in

1908-14. In the latter year, he became deputy commissioner of mines of Canada and dean of the faculty of applied science in the University of British Columbia. As consulting geologist, he served in Egypt during the World War in the Canadian military forces, with the rank of major. He was a member of many scientific and technical societies and a fellow of the Royal Society of Canada, which he served as general secretary. He was general secretary of the International Geological Congress, 1913-22, and of the Pan-Pacific Congress in 1923. He served as consulting geologist of the Crown Colony, Hong-Kong, 1926-27. He is the author of *The Physical Basis of Canada*.

**BROCKDORFF, BARON CAY VON (1874- )**. A German writer on philosophical topics. He was educated in the German state universities and became professor of philosophy at the University of Kiel. His philosophical works include *Die Philosophischen Anfangsgründe der Psychologie* (1905), *Die Geschichte der Philosophie und der Problem ihrer Bergreiflichkeit* (1906), *Die Wissenschaftliche Selbstbetrachtung* (1908), *Philosophie und Pädagogik* (1912), *Diskontinuität und Dialektik* (1914), *Die Wahrheit über Bergson* (1915), *Hobbes* (1919), *Schopenhauer und die Nachkantianer* (1919), *Descartes* (1923), *Englische Aufklärung* (1924), and *Deutsche Aufklärung* (1926).

**BROCKELMANN, KARL (1868- )**. A professor at the University of Halle (see VOL. IV). In 1917 he published *Die Älteren Vorläufer der Osmanischen Literatur*.

**BRODRICK, ST. JOHN, FIRST EARL OF MIDLETON (1856- )**. An English statesman (see VOL. IV). He became Knight of the Order of St. Patrick in 1915. In 1917-18 he served on the Irish Convention. He was created First Earl of Middleton, Ireland, and Viscount Dunsford of Dunsford, Surrey, in 1920.

**BROMFIELD, LOUIS (1898- )**. An American fiction writer, born at Mansfield, Ohio, who studied at Cornell and Columbia (honorary B.A. because of service in the World War). He served with the American Ambulance Corps attached to the French Army (1917-19) and was awarded the Croix de Guerre. His first novel, *The Green Bay Tree* (1924), was received with acclaim by the critics. In the following year *Possession* was hardly less successful, and in 1926 *Early Autumn* was awarded the Pulitzer Prize of \$1000. Among his later works are *A Good Woman* (1927); *The House of Women*, a play (1927); *The Strange Case of Miss Annie Spragg* (1928); and *Awake and Rehearse* (1929).

**BRONSON, HOWARD LOGAN (1878- )**. A Canadian physicist, born at Washington, Conn., and educated at Yale. In 1904 he was called to McGill University and remained there until 1910, when he accepted the Munro chair of physics at Dalhousie University, Halifax, N. S. His original work has included studies on radio activity, high resistance and standard cells, on which he has published valuable papers. He was president of the Nova Scotian Institute of Science, 1918-20.

**BRONZE AGE.** See ARCHAEOLOGY.

**BROOKE, RUPERT (1887-1915)**. An English poet, born at Rugby and educated at Rugby School and King's College, Cambridge, where he later won a fellowship. His first published volume was *Poems* (1911). Two years later he made a trip to America and on to the Samoan Islands, meanwhile writing letters home about

his travels. These were published at the time in a London newspaper and have since been published in book form as *Letters from America* (1916), with a preface by Henry James. One other book, *1914 and Other Poems*, published posthumously, and an essay, *John Webster and the Elizabethan Drama* (1916), conclude his short list of contributions to literature. Brooke's writing possessed so much power that lovers of poetry felt sharply the loss to English literature caused by his premature death on Apr. 23, 1915. He had joined the Naval Brigade early in the World War and was on his way to Gallipoli when he became a victim of blood-poisoning. His *Collected Poems*, prefaced by Edward Marsh, were published in 1918.

**BROOKHART, SMITH WILDMAN** (1860- ). A United States Senator, born in Scotland County, Mo., and educated in the public schools and in the Southern Iowa Normal School. After teaching in country and high schools for five years, he was admitted to the bar in 1892 and began practice at Washington, Iowa. He was county attorney (1895-1901), served as a second lieutenant in the Spanish-American War, was advanced to colonel in the Iowa National Guard, and in the World War was a major of ordnance and lieutenant colonel of infantry, serving as a special instructor in marksmanship. He was elected in 1922 to the U. S. Senate to fill a vacancy for the term ending in 1925 and was again elected as a Progressive Republican in 1926 for the term ending in 1933. He is the author of *Rifle Training in War* (1918), and *Rifle Training For War* (1920).

**BROOKLYN INSTITUTE OF ARTS AND SCIENCES.** An institution founded in 1824 in Brooklyn, N. Y., and reincorporated in 1890. Until 1917 it was divided into three general departments, education, museums, and the botanic garden; in that year the biological laboratory, founded in 1889 under Institute auspices, became a fourth department of the Institute. The department of education offered courses in a variety of subjects, and also arranged lectures and concerts by prominent men and women and eminent artists. By 1923, 1700 members were enrolled in the school of pedagogy; 308,248 attended lectures; and 901,875 engaged in other activities. In the same year, 761,681 attended the Museum, and 1,101,653 the Botanic Gardens, which comprised more than fifty acres. There were over 26,000 volumes in the library. The receipts rose from \$385,748 in 1917 to \$606,680 in 1928, and the permanent funds from \$942,400 to \$2,670,413. The Institute received a bequest of \$61,000 from Mrs. Georgietta Proctor for the work of the departments of physics and engineering, \$10,000 from Mrs. Caroline Mather for its general work, and the final payment of \$20,000 on the Robert B. Woodward bequest. Frank L. Babbott succeeded A. Augustus Healy as president in 1920, and John H. Denbigh became secretary in 1922.

**BROOKLYN POLYTECHNIC INSTITUTE.** An institution for the technical education of men, in Brooklyn, N. Y., founded in 1853. The day registration, which is restricted to 450, increased from a total of 187 in 1914, covering all departments, to a total in 1927-28 of 437, and the evening registration, from 514 in 1914, to 1483 in 1927-28. There was, in addition, a registration of 154 in the summer of 1928. The faculty in the latter year numbered 43 in the day session and 86 in the evening, including part-

time instructors. The productive funds of the Institute rose from \$389,876 to \$1,469,502, and the annual income from \$163,287 to \$324,607. The main college library, known as the Spicer Memorial, was a gift of the late Captain Elihu Spicer, in memory of his son Uriah D. Spicer of the class of 1873, and contained about 5000 volumes in 1928; the other five libraries were the Mailloux Library for the department of electrical engineering; technical libraries in the departments of chemistry, mechanical engineering, and physics; history and economics library, containing about 10,000 volumes; mathematics library; department of English library; and modern languages library. Degrees conferred by the Institute include: bachelor of chemical engineering, bachelor of civil engineering, bachelor of electrical engineering, bachelor of mechanical engineering, and bachelor of science in chemistry; also the degree of engineer; and the degree of master, with designation of the curriculum, upon completion of the necessary study. Among the more recent gifts to the Institute were the following: Cash from the estate of Charles E. Perkins, \$158,945.19, and stocks valued at \$170,781.50; \$6000, annually, from the United States Shellac Importers Association, for the establishment and maintenance of a research fellowship on the properties and uses of shellac; and apparatus and materials for use in the laboratories from individuals and industrial concerns. The Institute in 1928 possessed property valued at \$504,388 to be used as a building site for new buildings. President, Parke R. Kolbe, Ph.D., was chosen as the fifth president of the Institute in 1925, to succeed Fred W. Atkinson, Ph.D., who had served in that capacity since 1904.

**BROOKS, ALFRED HULSE** (1871-1924). An American geologist and explorer (see Vol. IV). He was commissioned lieutenant colonel of Engineers in 1918, and was chief geologist of the A.E.F., serving in France from 1917 to 1919. He was with the American Peace Commission in February and April, 1919.

**BROOKS, CHARLES** (1872- ). An American plant pathologist, born in Salem, Ind. He graduated from the University of Indiana in 1904 and took graduate courses at the University of Missouri. After teaching botany at New Hampshire College and the New Hampshire Agricultural Experiment Station, he became in 1912 pathologist at the Bureau of Plant Industry of the United States Department of Agriculture. He was a member of several scientific societies and carried on researches in fruit diseases, especially those of apples.

**BROOKS, JOHN GRAHAM** (1846- ). An American author and lecturer (see Vol. IV). He published *Labor's Challenge to the Social Order* in 1920.

**BROOKS, VAN WYCK** (1886- ). An American critic, born at Plainfield, N. J., and educated at Harvard. For a time he was an instructor at Leland Stanford, Junior, University. In 1920 he went to the *Freeman*, whose literary editor he was until that excellent periodical suspended publication in 1924. Early works published were: *The Wine of the Puritans* (1909); *The Malady of the Ideal* (1913), and *John Addington Symonds* (1914). With the appearance of his *America's Coming-of-Age* (1915), it at once was apparent that Mr. Brooks, better than any one else in his generation, had placed his fingers on the reason for America's æsthetic

sterility. His appreciation of the material and moral conditioning influence of the frontier on the development of American cultural life was a discovery of the first importance. His *Ordeal of Mark Twain* (1919), *The Pilgrimage of Henry James* (1925), and *Emerson and Others* (1927), really developments of the same theme, were by many considered the most important critical works of the period. For *Henry James*, he received the *Dial Prize* for 1923.

**BROOKS, WILLIAM PENN** (1851- ). An American agriculturist, born at South Scituate, Mass., and educated at the Massachusetts Agricultural College and in Germany. From 1877 to 1887, he was on the faculty of the Imperial College in Japan and for several years acted as its president. From 1889 to 1906, he was on the faculty of the Massachusetts Agricultural College. In 1889 he became director of the Massachusetts Agricultural Experiment Station and also acted as consulting agriculturist, 1918-21. He was a member of several scientific societies and contributed many reports on agricultural subjects to their proceedings. He wrote *Agriculture* (1901) and *General Agriculture, Dairying and Poultry Farming*.

**BROSSART, FERDINAND** (1840- ). An American Roman Catholic bishop, born in Germany and educated at St. Francis College, at Mt. St. Mary Seminary (Cincinnati), and in Belgium at the College of St. Nicolas and the University of Louvain. From 1872 until 1916, he was rector in various towns in Kentucky or vicar general of the diocese of Covington. He was bishop of Covington 1916-23. He translated several theological works from the German of Denifle, Meyenberg, and Schaefer.

**BROUGHTON, BROUGHTON, RUONA** (1840-1920). An English novelist (see Vol. IV). She died at Headington on June 5, 1920. Her latest novels include *Concerning a Vow* (1914; 6th ed., 1920), *A Thorn in the Flesh* (1917), *A Fool in her Folly* (1920).

**BROUN, HEYWOOD (CAMPBELL)** (1888- ). A newspaper columnist and author, born in Brooklyn, N. Y., and graduated from Harvard in 1910. He was connected with the *Morning Telegraph* (1908-09; 1910-12), and served as a columnist the *New York Tribune* (1912-21), the *New York World* (1921-27) and the *New York Telegram* (1927- ). He was long the editor of the column "It Seems To Me" in the *World*. He was dramatic critic of *Vanity Fair* and a lecturer on the drama at Columbia University in 1920 and at the Rand School in 1921. Heywood Broun has made himself known as a breezy and outspoken humorist, with now and then a guarded philosophy breaking the surface of his mirth. Having served as a war correspondent, he is the author of *American Expeditionary Forces—with General Pershing and the American Forces* (1918); also he wrote *Seeing Things at Night* (1921); *The Boy Grew Older* (1923); *The Sun Field* (1923); *Randle Follows His Nose* (1926); and *Anthony Comstock, Roundsman of the Lord*, with Margaret Leech (1927).

**BROWN, ALICE** (1857- ). An American author (see Vol. IV). Her later books include *Children of Earth* (1915); *Bromley Neighborhood* (1917); *The Prisoner* (1916); *The Flying Teuton* (1918); *Homespun and Cold* (1920); *The Wind Between the Worlds* (1920); *One-Act Plays* (1921); *Louise Imogen Guiney—a Study* (1921); *The Old Crow* (1922); *Ellen Prior*,

*verse* (1923); *The Mysteries of Ann* (1925); and *Dear Old Templeton* (1927).

**BROWN, ARTHUR JUDSON** (1856- ). An American clergyman and author (see Vol. IV). He was a delegate to the World Conference on Faith and Order at Lausanne, 1927. He has written *The Why and How of Foreign Missions* (rev. ed., 1921), *Unity and Missions—Can a Divided Church Save the World?* (1915), *Rising Churches in Non-Christian Lands* (1915), *Russia in Transformation* (1917), *The Mastery of the Far East* (1919); rev. ed., (1921), and *The Expectation of Siam* (1925).

**BROWN, CHARLES REYNOLDS** (1862- ). An American clergyman (see Vol. IV). In 1920 he was Ingersoll lecturer on immortality at Harvard University, and in the same year published his lectures under the title *Living Again*. He is also the author of *The Healing Power of Suggestion* (1916), *Five Young Men* (1917), *Who Is Jesus Christ?*, an address (1917), *The Master's Way* (1919), *Story Books of the Early Hebrews* (1919), *Yale Talks* (1919), *The Religion of a Layman* (1921), *Social Rebuilders* (Mendenhall Lectures, 1921), *The Honor of the Church* (1922), *Lincoln, the Greatest Man of the Nineteenth Century* (1922), *The Art of Preaching*, Yale University Lyman Beecher Lectures (1922), *The Larger Faith* (1923), *Why I Believe in Religion* (1923), *What Is Your Name?* (1924), *Where Do You Live?* (1925), *Ten Short Stories from the Bible* (1925), *These Twelve* (1926), and *The Making of a Minister* (1927).

**BROWN, DEMETRA KENNETH (DEMETRA VAKA)** (1877- ). A Greek-American author, born on the Island of Bouyouk Ada, Sea of Marmora. She ran away from home to escape a prearranged marriage and came to the United States. In 1904 she was married to Kenneth Brown (q.v.), novelist, and soon began to write. Her second book, *Haremlik*, published in 1909, commanded wide attention. It consisted of 10 studies of Turkish women. *A Child of the Orient* (1914) relates the story of the author's own childhood. Other books of hers include *The First Secretary* (1907); *The Duke's Price* (1910); *Finnella in Fairyland* (1910); *In the Shadow of Islam* (1911); *The Crasp of the Sultan* (1916); *The Heart of the Balkans* (1917); *In the Heart of German Intrigue* (1918), which grew out of interviews with King Constantine; and *The Unveiled Ladies of Stamboul* (1923).

**BROWN, ERNEST WILLIAM** (1866- ). An American mathematician (see Vol. IV). He was president of the American Mathematical Society from 1914 to 1916. In 1920 he published *Tables of the Motion of the Moon*.

**BROWN, FRANK CHOUTEAU** (1876- ). An American architect, born at Minneapolis, Minn., and educated at the Minneapolis School of Fine Arts and the Boston Art Club and in Europe. In 1902 he began practice in Boston and from 1907 until 1919 was editor of the *Architectural Review*. In 1916 he became a member of the faculty of Boston University and in 1919 head of the department of art and architecture. His publications include *Letters and Lettering* (1902); *The Orders of Architecture* (1904); *New England Colonial Houses* (1915); *Modern English Churches* (1917); *The Brick House* (1919); and *Modern English Country Houses* (1923).

**BROWN, GLENN** (1854- ). An American architect, born in Fauquier County, Va.,



and educated at Washington and Lee and George Washington universities and the Massachusetts Institute of Technology. He began practice in 1878, and was admitted to membership in important architectural societies of Europe and America, as well as to the American Academy in Rome and the National Institute of Arts and Letters. His publications include *Healthy Foundations for Houses* (1885); *Trap Syphonage* (1886); *A History of the United States Capitol* (1900); *Papers on the Improvement of Washington City* (1901); *Personal Recollections of Charles F. McKim* (1916); and *Roosevelt and the Fine Arts* (1919). He was also the editor of several series, among them being the *Proceedings of the American Institute of Architects* (1899-1909).

**BROWN, KENNETH** (1868- ). An American author and journalist (see VOL. IV). In 1917 he went with his wife to study the Greek situation; together, they published *In Pawn to a Throne* (1919). He is also author of *Putter Perkins* (1923). See BROWN, DEMETRA.

**BROWN, PHILIP MARSHALL** (1875- ). An American educator and diplomat, born at Hampden, Me., and educated at Williams College. In 1900-01, he served as secretary to Lloyd C. Griscom and from 1901 to 1903 was second secretary for the American Legation at Constantinople. He served as Secretary of Legation in Guatemala and Honduras, 1903-07, and as secretary of the American Embassy at Constantinople, 1907-08. From the latter year to 1910, he was Minister to Honduras. Resigning from the diplomatic service, he was appointed instructor in international law at Harvard University in 1912 and in the following year became assistant professor of international law and diplomacy at Princeton, where he was later appointed professor of international law (1915). He was associate editor of the *American Journal of International Law* and was an associate member of the Institute of International Law at Brussels. He was the author of *Foreigners in Turkey* (1914), *International Realities* (1917), *International Society* (1923), etc.

**BROWN, PRESTON** (1872- ). An American army officer, born at Lexington, Ky. He graduated from Yale in 1892 and in 1894 entered the Army as a private. He was commissioned 2d lieutenant in 1897 and rose through the various grades, becoming a major in 1916, a brigadier general in 1918, and a major general in 1925. He served as Chief of Staff in the 2d division at Château-Thierry and St. Mihiel in 1918, and was Chief of Staff for the 4th Army Corps. In August, 1918, he was appointed Commanding General of the 3d Division, serving in that capacity through the battle of Meuse-Argonne. In November, 1918, he became Assistant Chief of Staff at General Headquarters in the occupied German territory. He was appointed instructor in the Army General Staff College in 1919. He was awarded the Distinguished Service Medal for Exceptional Service for his work as Chief of Staff and in other capacities. In 1919-21 he was acting commander of the Army War College. In 1921 he was appointed commanding general of the 3d Infantry Brigade. In 1926 he commanded the 1st Corps area.

**BROWN, ROY** (1879- ). An American landscape painter. He was born at Decatur, Ill., and studied at the Art Students' League, New York, and the Académie Julian, Paris, as a pupil

of Jean Paul Laurens, René Ménard and Raffaelli. He was awarded the Ranger Fund Purchase Prize, National Academy of Design, in 1921; the Samuel T. Shaw Purchase Prize (\$1000) in 1925, and the Second Altman Prize for Landscape, N.A.D., in 1926. He was elected a member of the National Academy in 1926. His work is represented in the Metropolitan Museum of Art, New York, the Art Institute of Chicago, and various other galleries.

**BROWN, WALTER FOLGER** (1869- ). An American postmaster general, born at Massillon, Ohio, who was graduated at Harvard (1892), and studied at the Harvard Law School (1893-94). He practiced law at Toledo, Ohio from 1894 to 1927. In 1906-12 he was chairman of the Ohio Republican State Central Committee, joined the Roosevelt Progressive movement in 1912, and was chairman of the Progressive State Central and Executive Committee of Ohio (1912-13), and member of the Progressive National Executive Committee. From Nov. 2, 1927, to Mar. 4, 1929, he was Assistant Secretary of Commerce. He became a member of President Hoover's cabinet in March, 1929, being appointed Postmaster General.

**BROWN, WILLIAM ADAMS** (1865- ). An American theologian (see VOL. IV). He was acting provost of Yale University, 1919-20. From 1917 to 1919, he was secretary of the General War-time Commission of the Churches. He was also chairman of the committee on the War and religion, and a member of the committee of the *Outlook*, the Committee of Fourteen, and the administrative committee of the Federal Council of Churches of Christ in America. He was a member of the continuation committee of the World Conference on Faith and Order, 1927. He is the author of *Modern Theology and the Preaching of the Gospel* (1914); *Is Christianity Practicable?* (1916); *Modern Missions in the Far East*, privately printed (1917); *Christianity and Industry*, addresses (1919); *Minister as Teacher*, lectures (1920); *The Church in America* (1922); *Imperialistic Religion and the Religion of Democracy* (1923); *The Creative Experience* (1923); and *The Life of Prayer in a World of Science* (1926).

**BROWNE, EDWARD GRANVILLE** (1862-1926). An English professor (see VOL. IV). He was the author of *The Press and Poetry in Modern Persia* (1914); *Material for the Study of the Bābī Religion* (1918); *The Persian Constitutional Movement* (1918); a continuation of his *Literary History of Persia* (1920); *Literary History of Persia*, vol. ii, 3d ed. (1921); *Translation of Chatār Magāta*, with notes (1921); and *Arabian Medicine* (1921).

**BROWNE, GEORGE ELMER** (1871- ). An American artist born at Gloucester, Mass., educated at the School of Drawing and Painting, the Museum of Fine Arts and Cowles Art School (Boston) and a pupil of Jules Lefebvre and Robert Fleury in Paris. He was elected a full member of the National Academy of Design in 1928. He conducted classes in Europe in 1922, 1925, and 1927. Mr. Browne's canvases are broad in treatment and his manner very energetic. His pictures have been exhibited throughout Europe and the United States. In 1904 the French government bought his painting, "The Bait Sellers of Cape Cod," from the Salon. A collection of nine lithographs is in the New York Public Library. "The Wain Team" is in the National Gallery at Washington.

**BROWNE, PORTER EMBERSON** (1879- ). An American novelist and playwright, born in Beverly, Mass. He began writing short stories, verse, and essays in 1901. He was one of the founders of the *Vigilantes* in 1916. Among his plays are *A Fool There Was* (1906), *The Spendthrift* (1908), *A Girl of To-day* (1915), and *The Bad Man* (1920). He also wrote the one-act plays, *A Hero, In and Out, Married*, etc. Other works of his are *A Fool There Was*, a novel (1908); *Peace at Any Price* (1916); *Stars and Stripes* (1917); and *Some one and Somebody* (1917).

**BROWNELL, WILLIAM CRARY** (1851-1928). An American essayist and critic (see VOL. IV). He wrote *Criticism* (1914), *Standards* (1917), *American Prose Masters* (new edition, 1923); *The Genius of Style* (1924); *Democratic Distinction in America* (1928).

**BROWNING, JOHN M.** (1855-1926). An American gun inventor. He was born at Ogden, Utah, and at the age of thirteen made a gun of scrap iron in his father's gun shop. In 1879 he patented a breech-loading rifle and in 1884 a repeating rifle. Later, he obtained many other patents on rapid-fire guns. His automatic guns were adopted by several European governments. The United States government adopted his automatic pistol in 1908, and his machine guns and machine rifle in 1918. They were extensively used in the World War. He held the decoration of the Order of Leopold, of Belgium.

**BROWNING, OSCAR** (1837-1923). An English author and lecturer (see VOL. IV). He became Fellow of the Arcadia Academy, Rome, in 1918. In 1921 he was made trustee and chairman of the British Academy of Arts in Rome. He is the author of *A History of Medieval Italy, 568-1530* (1914), *A General History of Italy* (1915), *History of the Modern World* (popular edition, 1916), and *Memories of Later Years* (1923).

**BROWN-TAIL MOTH.** See ENTOMOLOGY, ECONOMIC.

**BROWN UNIVERSITY.** An institution of higher education at Providence, R. I., founded in 1764. It increased its enrollment during the period 1914-28 as follows: Undergraduate men students, from 910 to 1324; graduate students, from 102 to 275; students in the Women's College, from 203 to 500; students in the school of education, instituted in 1916, from 51 to 100. The faculty was increased in membership during the years 1914-28 from 77 to 204; and the endowment was brought up to \$9,405,032, of which \$8,931,612 was for the Men's College and \$473,419 for the Women's College, the income from endowment in 1928 being \$510,304. The library was increased to 350,000 volumes by 1928. In 1919, the University liberalized the entrance requirements by modifying the language and mathematics requirements and increasing the number of elective courses, as well as making compulsory a comprehensive psychological test. During the year 1926, the University charter was amended, removing the Baptist denominational requirement for president and adding six undenominational trustees, the charter having originally called for 22 Baptist trustees and 14 of other denominations; entrance requirements were further changed to require more algebra; new offices were created providing for a student counselor and director of religious activities, an athletic coach as a member of the faculty, and an athletic council, to have full

control of all athletic sports. The endowment and building funds were increased in the same year by \$1,000,000. In the following year, the graduate department of the University was made a graduate school, with a dean and a registrar; and gifts of five scholarships of \$1,000 each for graduate study at Brown were announced. In 1928 the corporation voted to change the name of the Women's College to Pembroke College; Prof. Albert Davis Mead, who had been serving temporarily as vice president of the University for several years, was permanently elected to that office; and the Rev. Dr. Clarence A. Barbour, of the Class of 1888, president of Colgate-Rochester Divinity School, Rochester, N. Y., was elected President, to succeed Dr. William H. P. Faunce, who retired in June, 1929, after serving as head of Brown for 30 years. Among the additions to the physical plant of the institution during the period under review were a new stadium, baseball field, and other extensive facilities for sports; Hlegeman Hall, a dormitory provided for by a gift from the estate of John R. Hlegeman; Marston Modern Language Building, a gift of Edgar L. Marston; Littlefield Hall, a dormitory; Alumnæ Hall, for social purposes, at the Women's College (1926); and in 1927 a biological annex, a gymnasium, and a psychological laboratory to house the new psychological department.

**BRUCE, ANDREW ALEXANDER** (1866- ). An American jurist, born at Nunda, N. Y., in the Madras Presidency of India, and educated in England and at the University of Wisconsin. He practiced law in Chicago from 1893 to 1898 and in the latter year was appointed assistant professor of law at the University of Wisconsin. In 1902 he was appointed professor of law at the University of North Dakota and from 1904 to 1911 acted also as dean of the College of Law. He was appointed associate justice of the Supreme Court of North Dakota in 1911 and served until 1916, when he became chief justice. In 1919 he was appointed professor of law at the University of Minnesota. Since 1922 he has held a similar chair at Northwestern University. He was a member of the Committee of the American Bar Association which investigated on the report of court martial proceedings in the United States Army in 1919. He was the author of *Property and Society* (1916), *Non-Partisan League* (1921), *The Law of Bailments*, and *The American Judge* (1924) and was a frequent contributor on legal subjects to magazines and newspapers.

**BRUCE, MAJ. GEN. SIR DAVID** (1855- ). An English army surgeon and scientific writer (see VOL. IV). While a member on the Advisory Board of the Army Corps, he did valuable research upon the connection between human and animal disease in Nyasaland, Africa (1911-14). From 1914 until his retirement, with the rank of major general, in 1919, he was commandant of the Royal Army Medical College, and in 1924-25 he was colonel commandant of the Royal Army Medical Corps. During the World War, he also worked with the War Office, on pathological, tetanus, and trench-fever committees. President of the British Association for the Advancement of Science (1924), he was a member of numerous other learned British and European societies, and received many honorary degrees and scientific awards.

**BRUCE, DONALD** (1884- ). An American forester, born at Newtonville, Mass., and edu-

cated at Yale University. He graduated from the Yale School of Forestry in 1910. From that year until 1916, he was forest assistant, forest examiner, and forest professor of the United States Forest Service. He was professor of forestry at the University of California, 1915-24, and silviculturist, U. S. Forest Service, after 1924. He wrote on subjects of forest engineering.

**BRUCE, HENRY ADDINGTON (BAYLEY)** (1874- ). An American author (see VOL. IV). In 1916 he resigned as staff contributor to the *Outlook*. He was psychological adviser to the *Associated Newspapers* (1915-17). He is the author of *Adventurings in the Psychical* (1914), *Sleep and Sleeplessness* (1915), *Psychology and Parenthood* (1915), *The Riddle of Personality* (new and rev. ed., 1916), *Handicaps of Childhood* (1917), *Nerve Control and how to Gain It* (1918), *Self-Development* (1921) and *Your Growing Child* (1927). He has edited *The Education of Karl Witte* (1914) and the *Mind and Health Series of Medical Handbooks* (1915).

**BRUCE, THE RT. HON. STANLEY MELBOURNE** (1883- ). A premier of Australia who was educated at Cambridge and served with distinction in the World War from 1914 to 1917, being twice wounded. In 1918 he was elected to the Australian Parliament and represented his country before the League of Nations in 1921. He became premier in 1923, during a period when Labor controlled most of the state governments. His efforts to make the central Government more effective were vetoed in the 1926 referendum. He represented Australia at the Imperial and Economic Conferences (1923) and at the Imperial Conference of 1926. In addition to the premiership, he became Minister for External Affairs in 1923 and Minister of Health in 1927.

**BRUCE, WILLIAM CABELL** (1860- ). United States Senator, born in Charlotte County, Va. His education was received at Norwood (Va.) High School and College (1875-78) and the University of Virginia (1879-80) and he obtained the degree of LL.B. at the University of Maryland. He practiced law at Baltimore, 1887-1923. He was a member of the Maryland Senate in 1894 and 1896, being president in the latter year. From 1903 to 1908, he was head of the Baltimore Law Department. In 1910 he was a member of the Baltimore Charter Commission and he served as general counsel of the Maryland Public Service Commission from 1910 to 1922. As U. S. Senator for the term 1923-29, he was an outspoken opponent of the prohibition laws. He is the author of *Benjamin Franklin, Self-Revealed* (2 vols., 1917); *John Randolph of Roanoke* (2 vols., 1922); and *Below the James* (1927).

**BRUCE, WILLIAM SPIERS** (1867-1921). Scottish explorer and scientist (see VOL. IV). Between 1912 and 1920, he made four scientific voyages to Spitzbergen, on which region he was an acknowledged authority.

**BRUCE-JOY, ALBERT** (1842-1924). An Irish sculptor (see VOL. IV), whose later ideal subjects include: "Thetis and Achilles," "The Pets," "The Cricketer," "The Fencers," "Tennis" and "The Boy Scout."

**BRUNE, ADOLPH GERHARD** (1870- ). An American composer, born at Bakkum, Germany. He received his first instruction from his father and then studied organ with E. Brennecke in Osnabrück. In 1889 he went to Peoria, Ill., where he remained five years as organist of St. Joseph's and the Cathedral. He then

moved to Chicago and after further study there under E. Liebling (piano) and B. Ziehn (composition) was appointed professor of piano and composition at the Chicago Musical College in 1898, a position he still held in 1929. Included among his works are four symphonies (E flat, E minor, D, and A); three symphonic poems, *Lied des Singschwans*, *Evangeline*, *Ein Dämmerungsbild*; four overtures; *Symphonic Fantasy* in C; variations on a theme by Beethoven; *A Fairy Tale*; two concertos for piano and orchestra, in C minor and F minor; a concerto for organ and orchestra in E flat minor; *Jerusalem*, a cantata for mixed voices and orchestra; two male choruses with orchestra, *Sängers Fluch* and *Saxons' War Song*; a mass, six parts, a cappella; Psalm 84 for ten parts; six string quartets; two string quintets; a string sextet; and numerous works for organ and for piano.

**BRUNEAU, ALFRED** (1857- ). A French composer (see VOL. IV). In 1925 he was elected a member of the Academy and made Inspector General of Musical Instruction. He added to the list of his works the operas (all produced at the Opéra Comique in Paris), *Les quatre journées* (1916), *Le Roi Candaule* (1920), *Le Jardin du Paradis* (1921), *Angelo tyran de Padoue* (1928); the lyric scene *Le Tambour* and *Le Navire*; *Lieds de France*, *Chansons à danser* and *Les Chants de la Vie*. He also published another book, *La Vie et les Œuvres de Gabriel Fauré* (1925).

**BRUNEL, brōō'n'y**. See STRAITS SETTLEMENT.

**BRUNOT, brūn'ō, FERDINAND** (1860- ). A French philologist born at Saint-Dié (Vosges) and educated there, at the Lycée Louis-le-Grand in Paris, and at the École Normale Supérieure. After teaching in Bar-le-Duc and Lyon, he became lecturer in the history of the French language at the University of Paris (1891), professor (1900), and dean of the faculty of letters there (1919). He was a member of the Institute of France and of the High Council for Public Instruction. His great work was *Histoire de la langue française des origines à 1900* (9 vols., 1902-27), and his other publications, besides those in reviews, include *Grammaire historique de la langue française* (1889), *La doctrine de Malherbe* (1891), and *La pensée et la langue* (1922).

**BRUNSCHVIG, LÉON** (1869- ). A French philosopher born at Nantes. On the death of Lachelier and of Boutroux, he became the recognized leader of the French school of critical idealists. Accepting from Boutroux the notion of the contingency of the laws of nature and from Lachelier the belief in the primacy of the act of judgment, he transformed the legacy of his masters into a modern philosophy of science standing equidistant from pure empiricism and from ontological rationalism. Brunschvig was educated at the École Normale Supérieure and won a prize from the Academy of Moral and Political Science in 1891 for a memoir on Spinoza. This youthful work, subsequently revised and expanded by the most painstaking scholarly research, went through several editions, and earned for its author the reputation of one of the keenest modern interpreters of Spinozism. Through his interest in the philosophy of the seventeenth century, he was led to undertake a commentary on Pascal and published an edition of the *Pensées* in three volumes and the complete works in 14 volumes (1908-21). His philosophic reputation was based chiefly on two works on the philosophy of

mathematics and of science. After ascending the regular academic ladder, Brunschvicg was called to the Sorbonne in 1914. In 1920 he was elected to the Academy of Moral and Political Science, and in 1923 he was nominated to the Legion of Honor. His works include *Spinoza* (1894), *Cambroune* (1894), *La Modalité du Jugement* (1897), *Pensées et Opuscules de Pascal* (1897), *Introduction à la Vie de l'Esprit* (1900), *L'Idéalisme Contemporain* (1905), *Les Étapes de la philosophie mathématique* (1812), *Nature et Liberté* (1921), *L'Expérience humaine et la Causalité physique*, (1922), and *Spinoza et ses Contemporains* (1923).

**BRUNTON, SIR THOMAS LAUDEB** (1844-1916). A distinguished British physician who devoted much of his time to original research in physiology and pharmacology. Born in Bowdon, Roxburghshire, he was educated at the University of Edinburgh. He spent years at Vienna, Berlin, Leipzig, and other medical centres, in the study of drug action, physiological chemistry, and physiology. With St. Bartholomews, he discovered the medical uses of amyl nitrite. As early as 1874, he tested a muscle extract on a diabetic patient and thus claimed priority in the use of internal secretions. His principal writings are *On Digitalis*, his graduation thesis (1868); *Tables of Materia Medica* (1877); *Textbook of Pharmacology, Therapeutics and Materia Medica* (1885); *On Disorders of Digestion* (1886); *Lectures on the Action of Medicines* (1897); *Index of Diseases and Remedies* (1890), translated into German, Italian, and Russian; *Disorders of Assimilation and Digestion* (1901); *Therapeutics of the Circulation* (1908); and *Collected Papers on Circulation and Respiration* (1916). He was knighted in 1900 and made a baronet in 1908.

**BRUSH, EDWARD F.** (1847-1927). An American physician and manufacturer born in Dublin, Ireland. He was taken to Canada when three years of age and later came to the United States. He took a degree in medicine at Bellevue Hospital Medical College in 1875 and in 1878 settled in Mt. Vernon, N. Y., where he became the city's first mayor, serving four terms. He was widely known as a pioneer manufacturer of kumyss, now in universal use in sickness.

**BRUSILOFF, BRŪSI-LOFF, ALEXEI ALEXEVITCH** (1853-1926). A Russian general, born of a prominent family at Kutais in the Caucasus. He was educated for the army and by 1909 had risen to the rank of a commanding general. In August, 1914, he led the 8th Army in Galicia where he distinguished himself in that and the following year. In 1916 he was commander on the southwestern front, where his offensive caused a victory over the Austrians near Lutsk, which eased the pressure of the latter on the Italian front for some time. In 1917, under the Lvov coalition ministry, he was commander-in-chief for about two months. He accepted the Bolshevik régime, and served under it as assistant counselor to Kamenev, commander-in-chief (1920), commander in southern Russia (1921), then in Moscow, and finally as head of the chief administration of the Red Army, a position which he held at the time of his death.

**BRUSSELS** (Fr. *Bruxelles*, Flem. *Brussel*). The capital of Belgium (see Vol. IV) and of the province of Brabant, situated in lat. 50° 51' N. and long. 40° 22' E. The population, including the suburbs, which form 12 distinct com-

munes and are the seat of most of the industries of Brussels, was 663,647 on Dec. 31, 1912; 685,268 on the same date, 1919; 684,870 in 1920; 775,039 in 1921; 783,522 in 1922; 787,060 in 1923; 794,311 in 1924; 801,656 in 1925; and 808,664 in 1926. The city is governed by a burgomaster, aided by seven aldermen and a town council. In 1921 the entire areas of Laeken, Haeren, and Neder-Over-Hembeek, and sections of Molenbeek-Saint-Jean and Schaerbeek were incorporated as a part of the city, raising the number of suburban communes from 8 to 12. The foremost manufactures are lace, wool, cotton, wood, and leather goods.

An international commercial fair, the object of which is to afford manufacturers an opportunity to bring their products to the notice of potential buyers from all parts of the world, is held annually in the Great Hall in the Parc du Cinquantenaire. At the ninth fair, which was held in April, 1928, there were 2889 exhibitors. Belgium had 1845 representatives; France, 440; Germany and Japan, 135 each; and Great Britain, 120. The Museum of Ornamental and Monumental Arts also is located in the Parc du Cinquantenaire, and in the old Porte de Hal is installed the Museum of Arms and Armor, a collection which includes souvenirs of Belgium's military past down to the World War. In contrast to the thirteenth-century Church of Saints Michel and Gudule is the modern Church of St. Mary, built in Byzantine style. Belgium's Unknown Soldier is buried at the foot of the column, surmounted by a statue of Leopold I, in the Place du Congrès.

**History.** In 1914 the Belgian Army did not defend Brussels, and on August 20 of that year German troops, led by General Sixt von Armin, occupied the city, which became the seat of the German civil government and of the Governor General of Belgium. On Sept. 2, 1914, Field Marshal von der Goltz was appointed to the latter position, and in the following year he was succeeded by General von Bissing. The citizens followed a policy of passive resistance led by Burgomaster Adolphe Max, who was deported, and Alderman Maurice Lemonnier. The city was the headquarters of the Comité National de Secours which, with the aid of the American Committee under Herbert Hoover, organized the feeding of the Belgian population. The Germans left Brussels early in November, 1918, and on the 18th of that month, the King and Queen of the Belgians made a state entry into their capital. From July to December 1920, three international financial conferences were held in Brussels.

**BRUSSELS CONFERENCE.** See REPARATIONS.

**BRYAN, CHARLES W.** (1867- ). A former governor of Nebraska, born at Salem, Ill. He is the younger brother of William Jennings Bryan. He was educated in the public schools and for a short time read for the bar but soon relinquished these studies to take up farming. For many years, he was associated with his brother in politics and in the editing of *The Commoner*. For five years he was editor and proprietor of the *American Homestead*. He was mayor of Lincoln, 1915-17. In 1922 he ran for governor of Nebraska and carried that normally Republican State by a majority of 50,300. He was tendered the nomination for the vice presidency by the Democratic National Convention in July, 1924. While governor, he established state gasoline filling stations.

**BRYAN, ELMER BURRITT** (1865- ). An American university president (see VOL. IV). On his resignation from the presidency of Colgate University, he became president of Ohio University in 1921.

**BRYAN, NATHAN PHILEMON** (1872- ). An American legislator and judge (see VOL. IV). He became judge of the United States Circuit Court of Appeals, fifth judicial circuit, in 1920.

**BRYAN, WILLIAM JENNINGS** (1860-1925). Ex-Secretary of State of the United States (see VOL. IV). He resigned as Secretary of State on June 9, 1915. In 1918 he became president of the National Dry Federation. After 1920 he changed his legal residence from Nebraska to Florida. As a delegate to the National Democratic Convention of 1924, he opposed a resolution denouncing the Ku Klux Klan. In religion, he became a leading exponent of fundamentalism. He aided the prosecution of John T. Scopes, the Dayton, Tenn., schoolteacher charged with teaching evolution in violation of a State law. He died a few days after the trial. He is the author of *The Making of Man* (1914), *Man* (1914), *A Message from Bethlehem* (1914), *The People's Law* (1914), *The Price of a Soul* (1914), *Royal Art* (1914), *The Value of an Ideal* (1914); *Prohibition*, an address (1916); *The War in Europe and Its Lesson for Us* (reprinted, 1916), *World Peace*, a debate with William Howard Taft (1917), *The First Commandment* (1917), *Heart-to-heart Appeals* (1917), *The Menace of Darwinism, and the Bible and Its Enemies* (1921), and *In His Image* (James Sprunt Lectures, 10th series, 1922). After his death, on July 26, 1925, there was published *The Memoirs of William Jennings Bryan*, by himself and his wife, Mary Baird Bryan.

**BRYAN, WILLIAM LOWE** (1860- ). An American psychologist and university president, born at Bloomington, Ind., and educated at the universities of Indiana, Berlin, Paris, and Wurzburg. He taught philosophy as a member of the faculty of the University of Indiana (1885- ), and in 1893 became vice president, and in 1902 president, of the university. In 1910 he was chosen trustee of the Carnegie Foundation. His principal professional contributions to psychology have dealt with the development of motor ability and the psychology of occupations. He is the author of *The Republic of Plato* (with his wife, 1898) and *The Spirit of Indiana* (1917).

**BRYAN-CHAMORRO TREATY.** See NICARAGUA.

**BRYCE, JAMES, VISCOUNT** (1838-1922). An eminent English writer and diplomat (see VOL. IV). During his later years he was an ardent supporter of the League of Nations. When he was 83 years old, he published his last book, *Modern Democracies* (1921). It is a comparative history of several democratic governments.

**BYRN MAWR (mār) COLLEGE.** A non-sectarian institution for the higher education of women at Bryn Mawr, Pa., founded in 1880. Throughout the period from 1914 to 1928, the enrollment remained about the same, with a registration of 494 in 1928-29. The faculty in the autumn of 1928 numbered 79 members. The number of volumes in the library was increased during the period under review from 74,293 to 120,500, and the productive funds of the college from \$1,184,323 to \$5,481,000, largely as a result of endowment campaigns conducted in 1918-20

and 1925. A summer school for women workers in industry was opened in 1921 under the direction of a committee composed of an equal number of representatives of the college and of women workers in industry, and was held annually thenceforth. A department of music was also established in 1921; in 1925 a \$500,000 fund was raised for the endowment of the department of music, and to permit the building of Goodhart Hall, for student organizations and the department of music, which was completed and dedicated at the close of the college year in 1928; and a system of reading for honors was introduced in 1927-28. President, Marion Edwards Park, Ph.D., LL.D., succeeded M. Carey Thomas, Ph.D., who resigned in 1922, after serving for 28 years as president of the college.

**BRYUSOV, VALERY J.** (1873-1924). A Russian poet, novelist, and critic, born in Moscow. With Balmont (q.v.), he was one of the leading symbolists and helped found the Modernist school. Also, like Balmont, he was strongly influenced by Poe's works. His first verses, published in 1894, show an affinity to the French Symbolists, but his later works were of a more classical character. He wrote of the modern industrial city, and using Pushkin as a model, emphasized the horrible. He edited *The Scavenger* during its existence, and later the literary section of *Russkaja Mystj*. At first, he was ridiculed, but eventually he was recognized as a master of classical literature. His works include *Stephanos* (1905); *The Axis of the Globe*, short stories and plays (1907); *The Flaming Angel*, a novel (1909); *The Far and Near*, two volumes of essays, and *The Republic of the Southern Cross, and other Stories* (1918). His complete works in 25 volumes were published in 1912. He translated many foreign poets, including Verlaine, Maeterlinck, D'Annunzio, Oscar Wilde, and Verhaeren.

**BUBER, MARTIN** (1878- ). A Jewish author and scholar, born in Vienna. His principal works are *Die Geschichte des Rabbi Nachman* (1906), *Die Legende des Baalschem* (1907), *Ekstatische Konfessionen* (1908), *Reden und Gleichnisse des Tschuang-Tse* (1910), *Drei Reden über das Judentum* (1911), *Daniel* (1913), *Vom Geiste des Judentums* (1915), *Die Jüdische Bewegung* (1917), *Die Rede, die Lehre und das Lied* (1917), *Worte an die Zeit* (1919), *Cheruth* (1919), *Der Heilige Weg* (1919), and *Der Grosse Maggid* (1921). Buber edited the *Kalevala* and *Die Gesellschaft*, a collection of social-psychological monographs (1906-13). He translated *Die Schrift* in collaboration with Franz Rosenzweig (1925) and *Des Baalschem Unterweisung* (1927).

**BUBONIC PLAGUE.** An epidemic of this affection at Dakar, West Africa, in 1914-15, showed that it may be transmitted directly from man to man in the bubonic as well as pneumonic forms and that the rats then become attacked secondarily. It further appeared that patients with bubonic plague are often vigorous-looking and able to travel long distances and that the white residents in cities like Dakar are not much exposed to contagion.

There has been an unusual opportunity of studying its inroads in new territory especially in South Africa. Up to 1890 the disease was practically unknown here or at least had never penetrated beyond the seaports. In 1901 the rats of the Cape Town docks developed an epizootic of plague and from that time on the dis-



ease has been classed among the endemic maladies, cases in mankind standing in a natural relationship with rat infection. In the period 1916-1920 spontaneous cases developed in certain localities which for a long time baffled the health authorities. Not until 1921 was it shown beyond doubt that certain species of wild rodents were suffering from the disease and were in position to transmit it to human victims. These included mice and ground squirrels. In 1923-24 a serious epidemic broke out in the Orange Free State in which 329 people were victims with a mortality of almost 60 per cent. About 12 per cent of the victims died of the pneumonic form of the disease. At the same time, the rodents of this area had been nearly exterminated. They were chiefly wild but had they belonged to the semi-domestic species like household rats and mice—which seem to have escaped the epizootic—the ravages must have been infinitely greater. The flea parasites of wild rodents seldom attack the domestic species.

**BUCHAN**, buk'an, JOHN (1875- ). A British author and member of Parliament, born at Perth and educated at Glasgow University and Brasenose College. He received the Newdigate Prize in 1898. In 1901-03 he was private secretary to Lord Milner, then the High Commissioner of South Africa, and in 1906 joined the Edinburgh publishing firm of Thomas Nelson & Sons of which he became a director. He was elected a member of Parliament as a Conservative in 1927. His early publications, which include *The African Colony* (1903) and *A Lodge in the Wilderness* (1906), are obviously based on his early life in Africa. Among his later publications are some exceptionally well-written novels and accounts of the World War, particularly a *History of the Great War* (1921-22; 4 vols., 1923). The last mentioned is an effective summary of its gigantic subject. A few of his more recent books are *Lord Minto: A Memoir* (1924); *John Macnab* (1925); *Witch Wood* (1927); *The Runagates Club* (1928); *Montrose*, a brilliant study of Scottish history (1928); and *Courts of the Morning* (1929).

**BUCHAREST**, TREATY OF, MARCH, 1918. See RUMANIA.

**BÜCHER**, buk'ér, KARL (1847- ). A German historian and economist, born in Kirberg. He studied history, philology, and economy at Bonn and Göttingen and was professor at the universities of Dorpat, Basle, and Karlsruhe, and rector at Leipzig. He wrote many works on economic and social topics, among them *Die Aufstände der Unfreien Arbeiter* (1874), *Die Frauenfrage im Mittelalter* (1882), *Die Gewerblichen Betriebsformen in Ihrer Historischen Entwicklung*. (1892), *Arbeit und Rhythmus*, 5th ed. (1919), *Der Deutsche Buchhandel und die Wissenschaften* (1904), *Das Zeitungswesen* (1911), *Der Deutsche Kaufmann und die Handelshochschule* (1911), *Unsere Sache und die Tagespresse* (1915), *Das Städtische Beamten-tum im Mittelalter* (1915), *Die Deutsche Tages-presse und die Kritik* (1917), *Der Sozialismus* (1919), and *Lebenserinnerungen* (1919).

**BUCHHOHN**, JOSEF (1875- ). A German writer, born at Cologne. He has been connected with various newspapers and has published *Die Hohenstauffen*, a novel (1908); *Luginsland*, a volume of sketches of the lower Rhine (1909); the plays, *Studenten und Sehnsucht* (1918); the comedy, *Der Schächer von Jena* (1920); some volumes of war verse, *Deutsche*

*Jugend*, *Wach' Auf* (1917); *Der Deutsche Zeitspiegel* (1920); and numerous works of a militant character, like *Wir Vergessen zu Leicht* (1917), *Zwischen Goethe und Scheidemann* (1919), *Politik und Presse* (1919), *Bekenntnisse* (1920), *Hindenburg, der Führer in Unsere Zukunft* (1920), and *Lasst uns vom Reiche Zeugen* (1921). He recently published *Margaret Helmers*, a novel (1922); the plays *Bartholomäus Blume*, *Die Michelstrude*, and *Schill*; a volume of stories from the Rhine *Zwischen den Welteren* (1927); and the novel, *Abgeordnete Meyer* (1927).

**BUCHNER**, boog'ner, MAX (1881- ). A German writer, born at Munich. He studied at the university, specialized on the history of the Carolingian period, and wrote, among other works, *Eine Humanistische Lobrede auf Kilian von Bibra* (1908), *Entstehung und Ausbildung der Kurfürstenfabel* (1912), *Bayerns Teilnahme an den Deutschen Königswahlen* (1913), *Grundlagen der Beziehungen zwischen Landeskirche und Thronfolge im Mittelalter* (1913), *Biographie des Aldrich* (1914), *Zum Briefwechsel Einhardts und des Ansegs* (1918), *Einhard als Künstler* (1919), *Einhard's Künstler und Gelährtenleben* (1922), and *Schwarzrotgelb und Schwarzrotweiss* (1924).

**BUCHTEL**, buk'tel, COLLEGE. See AKRON, UNIVERSITY OF.

**BUCK**, BEAUMONT BONAPARTE (1860- ). An American army officer, born in Mayhew, Miss. He graduated from the United States Military Academy in 1885 and was commissioned second lieutenant in the same year. During the Spanish-American War, he served as major of the 2d Texas Infantry. He was commissioned captain in the Regular Army in 1899, lieutenant colonel in 1914, colonel in 1916 and brigadier general of the National Army in 1917. He commanded the 28th Infantry of the 1st Division of the American Expeditionary Force in 1917, and in the same year was given command of the 2d Infantry Brigade of the 1st Division. In 1918 he was appointed commander of the 34th Division and participated in the first all-American offensive in 1918. He also took part in all the other major campaigns of the American troops in France. In November, 1918, he returned to the United States and was appointed commander of Camp McArthur. He served as commander of various other camps and departments and in 1921 became acting chief of staff with the 90th Division of organized reserves. He was retired in 1924.

**BUCKLAND**, WILLIAM WARWICK (1850- ). An English professor of law. He attended Gonville and Caius College, Cambridge, and was later called to the Inner Temple Bar. Elected a fellow of Cambridge in 1887, he became a law lecturer there in 1895, a tutor in 1903, and in 1914 Regius professor of civil law. He was made president of Gonville and Caius College in 1923. An honorary LL.D. degree was conferred on him by the university of Edinburgh, and the honorary Dr. en Droit degree by the universities of Lyon and Louvain. Besides contributing to various publications, he wrote *Works on Roman Private Law*.

**BUCKNELL UNIVERSITY**. A coeducational Baptist institution, offering courses in liberal arts, biology, education, commerce and finance, and engineering, at Lewisburg, Pa.; founded in 1846 as the University of Lewisburg, but renamed in 1886 in honor of its benefactor,

William Bucknell. During the period 1913 to 1928-29, the registration increased from 600, of which one-sixth was in the preparatory departments, to 1097; the faculty was increased from 48 members to 71; and there was a summer session in 1928 with a registration of 318. The productive funds increased from \$1,250,000 in 1913 to \$1,700,000 in 1928 and the income in the latter year was \$554,000. A campaign to raise an additional \$1,000,000 for the endowment fund was successfully completed in 1926; a dormitory to accommodate 170 women, and the Ziegler Memorial Infirmary, a gift of Mrs. Ziegler, in memory of Dr. S. Lewis Ziegler of Philadelphia, were completed in the following year; and a new botany building with a large greenhouse, and a new dining hall for women were erected in 1928. Emory W. Hunt, D.D., LL.D., D.C.L., became president in 1919.

**BUDAPEST**, bō'dā-pēst. The capital of Hungary. The population in 1927 was 971,169. The new commercial free port of Budapest, situated on Csepel Island, about  $2\frac{1}{2}$  miles below the city, was opened on Oct. 22, 1928. It comprises an area of about 1500 acres and cost about \$4,500,000. It consists of two parts, the free port and the petroleum port. The free port has a length of 1000 meters (3280.8 feet) and is about 150 meters (492 feet) wide. Barges can be accommodated along the wharves for a distance of about 2200 meters (7217.83 feet) and there is a depth of water of 2.0 meters (8.53 feet) above the low-water mark in this part of the Danube. The big grain elevator comprises 14 floors and has capacity for 45,000 tons of grain. The petroleum port is situated south of the free port and comprises a basin of 360 meters (1181.1 feet) long by 120 meters (393.7 feet) wide. This part of the port was finished in 1924 and during 1928 handled about 70,000 tons of oil. The Széchenyi Suspension Bridge, the oldest fixed bridge across the Danube, has been rebuilt by complete renewal of the cables and suspended structure and reinforcement of the anchorages at a cost of 6,500,000 kronen, equivalent to \$1,300,000 at the time. The main span of the bridge is 665 feet centre to centre of piers; the side spans from pier centre to face of anchorage are 288 feet each; the length of the bridge between outer ends of anchorages is about 1500 feet. This masterpiece of engineering was built between 1838 and 1848 on the initiative of Count Stephen Széchenyi. From a technical point of view the Elizabeth Bridge, built between 1898 and 1903, is the most important construction in Budapest. It has a single span of 290 meters (over 300 yards) in length, being the longest span in all Europe.

A portion of the Millenary Monument, which was begun in 1896 to commemorate the thousand years' existence of Hungary, was destroyed during the Commune in 1919. In the niches are statues of Hungarian kings and bas-reliefs representing historical scenes. New museums include the Museum of the Hungarian National Association of Plastic Arts and the Agricultural Museum, built with a view to representing all the important characteristics of Hungarian agriculture beginning with the Roman Age. The latter is situated on Széchenyi Island in the Town Park lake. The building is a reproduction of the ancient castle of "Vajda-Hunyad," a special feature of which is the magnificent Hall of Knights. On the east side of the lake stands a bronze statue of George Washington, erected by Hungarian-

Americans. Other recent buildings are the Church-House and College of the Piarists erected in 1915 and the National Archives, in Roman style, erected in 1918. The Szadadság Tér (Liberty Square) contains four statues representing the portions of the country severed from Hungary by the Trianon Peace Treaty of 1920.

**BUDGE**, SIR ERNEST A. WALLIS (1857- ). An English Orientalist (see VOL. IV). He retained his position as keeper of Egyptian and Assyrian antiquities at the British Museum until 1924. He was knighted in 1920. Among his numerous books are *Papyrus of Ani* (1913); *Rosetta Stone* (1913); *Short History of the Egyptian People* (1914); *Literature of the Ancient Egyptians* (1914); *Egyptian Wall-Painting* (1914); *Egyptian Sculptures* (1914); *Assyrian Sculptures* (1914); *Miscellaneous Coptic Texts in the dialect of Upper Egypt* (1915); *By Nile and Tigris* (1920); *An Egyptian Hieroglyphic Dictionary* (1920); *The Seven Tablets of Creation* (1921); *The Queen of Sheba and Menyelek* (1921); *Legends of the Virgin* (1922); *110 Miracles of the Virgin* (1923); *Fairy Tales* (1923); *Tutankhamen* (1923); *Baralâm and Yêwdsêf*, 2 vols. (1923); *The Teaching of Amenemapt* (1924); *History of Assyriology* (1925); *Babylonian Life* (1925); *Dwellers on the Nile* (1926); *Cleopatra's Needle* (1927); *History of Ethiopia (Nubia and Abyssinia)* (1928); *Cave of Treasures* (1928); *Book of the Saints of the Ethiopian Church*, 4 vols. (1928); *Divine Origin of the Craft of the Herbalist* (1928); and *The Monks of Kulblai Khâm* (1928).

**BUDGET**, AMERICAN. See FINANCE AND BANKING.

**BUERGER**, bur'ger, LEO (1879- ). An American surgeon distinguished as a bacteriologist, urologist, and blood-vessel surgeon. He was born in Vienna, received his medical training at Columbia University (M.D., 1901), and studied at the surgical clinic of the University of Breslau (1905-06). Later, he became professor of urological surgery at the New York Polyclinic Hospital. He has been a prolific writer on bacteriology and urology since 1909 and some of his urological papers have appeared in the French and German special journals. His recognition of a disease named by him thromboangitis obliterans caused him to be widely known. This affection is often spoken of as "Buerger's disease." His earliest paper on the subject appeared in 1909 and in 1924 he published a large monograph, *The Circulatory Disturbances of the Extremities*.

**BUFFALO**. A city of New York State, the second in population and one of the Great Lakes ports. The population increased from 423,715 in 1910 to 506,775 in 1920 and to 555,800 in 1928, by estimate of the Bureau of the Census. In 1916 the city adopted the commission form of government. It provided for a council, composed of the mayor and four commissioners elected at large on a nonpartisan ticket for four-year terms. This was changed in 1928 to a councilmanic form of municipal government. Several important municipal improvements recently have been effected. A tunnel 6500 feet long was bored to carry the water from Lake Erie to the city's new pumping station and a new water purification plant was built at a cost of \$4,000,000. A high-pressure system for fire protection was installed in the business districts. The outer harbor was improved; the Buffalo River was deepened and enlarged upstream; and a new

drawbridge was built. On Aug. 7, 1927 the International Bridge between Buffalo and Fort Lee, Ontario, was formally dedicated. The New York Barge Canal system was provided with two large terminals for the transfer of cargoes from the large lake freighters. In 1928 the city had 37.4 miles of water front, two-thirds of which had been improved, two water-front parks being constructed by reclaiming land from Lake Erie and Niagara River. Among the office buildings and other structures which have been constructed are the Buffalo Athletic Club, the Elks Club Building, the Liberty Bank Building, the Saturn Club, the Rand Building, the New York Central Railroad Terminal, the National Sciences Museum, and seven branch libraries. The Buffalo Normal School, the largest in the State, is being replaced by a larger State Teachers College. The University of Buffalo, Canisius College, and other private institutions are being enlarged, and four new high schools and 23 public schools are being erected. The number of dwellings constructed within the city's limits increased from 2007 in 1914 to 3615 in 1923; in 1928 approximately 3000 were constructed. The assessed valuation of property in Buffalo increased from \$346,560.790 in 1914 to \$1,059,000,000 in 1928, according to local estimate; the net debt in 1927 was \$78,185,000.

Buffalo has the greatest diversity of industries of any manufacturing city. During and following the World War, it became the largest airplane manufacturing city, the largest aniline producing centre, and one of the most important rubber and tire centres in the United States. After 1920 several new flour-milling companies, which increased the annual output of flour approximately from 6,000,000 to 10,000,000 barrels, were added to the city's industries; and the capacity of its grain elevators, all of modern construction, was enlarged to 41,000,000 bushels. Buffalo is also an important steel, iron, copper, and brass centre. Its industries which numbered 2225 in 1914 were increased to 2500 in 1928. The number of wage earners increased from 54,416 in 1914 to 75,899 in 1919, while the value of products manufactured increased from \$247,516,000 in 1914 to \$634,410,000 in 1919. In 1925, according to the U. S. Census of Manufactures, 60,015 persons were employed in these industries and received \$96,000,000 in wages. The value of products manufactured was \$675,436,000. The growth of industry forced the greater utilization of the hydroelectric power resources of Niagara Falls, so that by 1928 more than 95 per cent of the power used was from that source. Commerce has developed to such an extent that Buffalo is the largest inland port in amount of tonnage, and the fourth port in foreign import commerce in the United States.

**BUGAYEV, B. N.** See **BYELY, ANDREY.**

**BUILDING.** See **ARCHITECTURE; CITY PLANNING.**

**BUISSON, bwé'sôn', FERDINAND (EDOUARD)** (1841- ). A French administrator, publicist, and pedagogue (see **VOL. IV**), who again served in the Chamber of Deputies (1919-23). From 1916 to 1926, he was president of the League of the Rights of Man, and in 1927 he was awarded the Nobel Peace Prize. He wrote *Le fond religieux de la morale laïque* (1919).

**BUKOWINA, bōō'kō-vē'nā.** Formerly a crownland of Austria, but since November, 1918, a Rumanian province. Area, 4030 square miles; population in 1910, 800,098; estimated popula-

tion in 1922, 689,907. In spite of Austrian occupation since 1777, the population was largely Rumanian and Ruthenian. The largest town, Cernauti (Czernowitz), had an estimated population of 100,000 in 1920. The inhabitants, densely settled on the land, devoted themselves to agriculture and its by-products, the most important industries being brewing and flour milling. The cultural level of the people was low, and illiteracy was higher there than in any other of the former Austro-Hungarian crownlands except Dalmatia. Late in 1918, when the fall of the Austrian monarchy seemed imminent, the people expressed their desire for reunion with Rumania, only the Ruthenians, who indeed were in a plurality, dissenting because of their traditional friendship with Austria. The Treaty of St. Germain allocated almost the whole province to Rumania except for a small territory in the north crossed by the railroad running from Zaleszczyki to Kolomea and including a railroad junction which was given to Poland. In 1920 Bukowina's national council was dissolved and a provincial government was erected, drawing its powers from the central Government. Bukowina is represented by 19 Senators and 16 Deputies in the Rumanian Parliament.

**BULGARIA.** A European kingdom situated in the Balkan Peninsula. Area in 1926, 39,814 square miles; in 1914, 43,305 square miles. The census of Dec. 31, 1926, recorded 5,483,125 inhabitants. By the census of 1910, there were 4,337,513 inhabitants to which were added 130,000 people in 1913, as a result of the territorial gains of the Balkan wars. By the Treaty of Neuilly, Bulgaria was compelled to cede to Jugo-Slavia the following districts on its western front: Tsaribrod (21,000 Bulgarians and no Serbs), Bosilegrad (22,000 Bulgarians and no Serbs), Strumitsa (25,000 inhabitants, mostly Bulgarians with a few Macedonians and no Serbs), and a portion of the Timok Valley. To Greece went Western Thrace, thus depriving Bulgaria of her outlet on the Aegean. (See **THRACE**.) The capital, Sofia, in 1926 had 213,162 inhabitants. Other large towns, with their populations in 1926 are Philippopolis (85,188), Varna (60,787), Ruschuk (45,672), Slivno (29,335), Plevna (29,063).

**Agriculture and Industry.** Agriculture as the chief occupation engages two-thirds of the people, most of whom possess their lands outright. In 1921, 9,290,175 acres were under cultivation. The accompanying table indicates the principal crops and their yields (in short tons) for 1909-13 and 1927.

Crops	Area (thousands of acres)		Production (thousands of units—bushels, except as indicated)	
	1909-13 *	1927	1909-13 *	1927
Wheat	2,409	2,658	37,823	47,346
Rye	542	463	8,345	8,243
Barley	516	555	10,380	14,041
Oats	408	321	8,651	7,481
Corn	1,492	1,662	26,277	20,614
Mixed grain	173 †	232	59 †	122 †
Potatoes	11	28	532	2,205
Tobacco	36	63	23,435 §	34,811 §
Grapevines	135 ‡	161	8,488 ‡	45,569

\* Comprising territory within present boundaries.

† 1914. ‡ Unit, metric ton. § Unit, pound.

|| Unit, gallon of must.

The mining industry has shown great advances. Coal mined in 1927 totaled 1,237,650 metric tons, as compared with an average pre-war yield of

125,000 tons. Copper, salt, cement, and lead production are considerable.

**Commerce and Transportation.** Converted on a basis of average annual exchange, imports for 1913, 1920, 1927, were valued at \$36,535,000, \$39,849,000, \$44,403,000; exports for the same years were \$18,013,000, \$29,574,000, \$47,988,000. Since the World War, favorable trade balances have been secured only in 1922 and 1927. Principal countries of origin of imports (1927) were Germany, United Kingdom, Italy, Austria, United States. American imports reached an average of \$200,000 for 1910-14, \$1,900,000 for 1921, and \$701,000 for 1927. Principal countries of destination of exports in 1927 were Turkey, Germany, Italy, France, United States. Exports to the United States totaled an average of \$400,000 for 1910-14, \$400,000 for 1921, and \$494,000 for 1927. Size of shipping, an excellent index of the state of the country, showed that 4,951,452 tons entered Bulgarian ports in 1911; in 1925 only 3,073,437 tons. In 1913 the total length of railways was 1388 miles, all state owned; in 1927 these had increased to 1651 miles. Several short lines were projected after the War, but lack of funds held up the work of construction.

**Finance.** On Jan. 1, 1912, the public debt totaled 623,346,807 leva (with the lev equal to the franc). On Sept. 30, 1927, the total debt was \$205,292,000; consisting of internal funded debt, \$4,275,000; internal floating debt, \$34,328; external funded debt, \$165,371,000; and external floating debt, \$1,218,000. Reparations by the Treaty of Neuilly were fixed at 2,250,000,000 gold francs, but early in 1923 were lowered to 550,000,000 gold francs, payable during 60 years. The internal debt, of course, was insignificant because of the depreciation of the currency. Revenues in 1909 were \$38,584,418; expenditures, \$36,830,884; of which latter, for debt service, \$415,120. For 1926 government finances were (converted at average exchange rate): revenues, \$46,566,000; expenditures, \$45,985,000. The revenue for 1927-28 was estimated at \$50,630,000 and expenditures of \$50,628,000. That for 1928-29 called for receipts of 6747 million leva and expenditures of 6993 million leva. The paper currency steadily increased. In 1913, 188,742,000 leva were in circulation; at the end of 1927, 3,726,972,000. For this, there was in the country on Dec. 31, 1927, 1,277,435,000 leva in gold and 165,382,000 leva in silver. The cost of living rose twentyfold between 1913 and 1922, and continued to rise in 1923, 1924, and 1925. It declined slightly in 1926 and still further in 1927 due to a partial *de facto* stabilization of the currency.

**Defense.** By the Treaty of Neuilly, Bulgaria's war establishment was to be reduced to an army of 20,000 men, voluntarily enlisted for a 12-year term; a frontier guard of 3000, and a gendarmerie of 10,000. Owing to circumstances caused by unrest on the borders of Bulgaria, a slight increase in the treaty establishment was authorized and on Jan. 1, 1927, there were 19,016 men in the regular army, 6431 in the gendarmerie, and 2874 in the frontier guard, all branches of the service thus being within the treaty limits.

**History.** Still smarting from the humiliations of the Treaty of Bucharest (1913), Tsar Ferdinand and the ruling clique—for the Bulgarian population was almost exclusively a peasantry and had little understanding of the pur-

port of modern nationalism—planned to retrieve their fortunes by entering the War on the winning side. Deluged with propaganda, the country held back its decision for more than a year. But the Entente could not meet all the Bulgarian demands because Serbia and Greece would not give up parts of Macedonia demanded, and when the Agrarian leader, Stambulisky, who contended for neutrality, was silenced by a sentence of life imprisonment, the way was clear for the country to cast its lot with the Central Powers. War was declared on Serbia on Oct. 12, 1915. The decision aided the Central Powers in a strategic rather than a material way, for it cleared the path for munitions and troops to Constantinople, cut off Russia from her allies, and forced the Allies to send troops to a new front at Saloniki.

Aided by German money and technical help, Bulgaria in the first two years enjoyed phenomenal successes. Serbia's armies were pressed back to the Adriatic, and in a grandiose manifesto, the Bulgarian King declared that the traditional enemy no longer existed. War was declared on Rumania, Sept. 1, 1916, and armies occupied the Dobrudja. In November, Monastir fell, opening Macedonia to the invader. But in 1917 the Bulgarian effort perceptibly weakened, partly because of the failing food supply and the discontent of the peasant soldiery who had been long away from their fields. When the line of defense was lengthened, in July, 1918, through the Austro-Hungarian defeat in Albania, Bulgaria's position became precarious. In September, 1918, Serbian troops broke across the frontier and the Bulgarian high command, realizing defeat, asked for an armistice.

On Oct. 4, 1918, King Ferdinand abdicated, and with him fled the ministry. Boris III succeeded to the throne. Stambulisky was released from prison and formed an Agrarian government, which was, on Nov. 27, 1919, invited to sign the Treaty of Neuilly. The terms were onerous. Territorial cessions were required in disregard of economic and ethnographic considerations. Certain small districts on the western frontier were turned over to Jugo-Slavia for strategic reasons. The renunciation of Thrace deprived Bulgaria of her Aegean littoral, as well as important winter pasture lands in the valleys south of the mountains which were made the international boundary. Other terms were: the confirmation of the cession of the southern Dobrudja to Rumania; the reduction of the army; the surrender of all tanks, armored cars, poison gas, airplanes; a reparation charge of 2,250,000,000 gold francs; restitution of all live stock seized; an annual supply for five years of 50,000 tons of coal to Jugo-Slavia; the support of all Allied commissions. Concessions were made in a guarantee of freedom of transit to the Aegean and a promise of the protection of Bulgarian minorities in neighboring states. The problems of the new Government were intensified by the presence of the 300,000 refugees who flocked into the country from Thrace, Macedonia, and the Dobrudja.

The Agrarian government was confirmed in power by the general elections of Mar. 28, 1920, which returned 110 Agrarians, 50 Communists, and 9 Socialists, as compared with 59 for the bourgeois parties. Under Stambulisky, an internal policy was formulated wholly in the interest of the agricultural class. A reconstruction programme, stubbornly pushed in the face of the

opposition of the bourgeoisie, included such diverse items as compulsory labor (1920), the expropriation of Crown and Church lands and all estates over 75 acres in the interests of the landless peasantry (1921), the prohibition of speculation and profiteering (1920), the extension of the education code (1920), and government control of foreign trade through consortiums. Stambulisky's tone toward his central European neighbors was friendly. A healthy agrarianism was the foundation of his country's well-being as it was also, he saw, of Czechoslovakia, Poland, Jugo-Slavia, and Rumania. In January, 1921, he tried to gain the support of the first two for the creation of an international agrarian league, the so-called Green International, for their common protection against the bourgeois reactionaries and the communist radicals. The same purpose was expressed in the declarations of the congress of the Bulgarian Peasant Union, held in February, 1921. To lighten his country's burdens by gaining the good will of the Supreme Council and to show western Europe that Bulgaria had parted with the old ways, during 1921-23, Stambulisky proceeded against those ministers who had involved the country in the War by contracting an alliance with Germany and breaking off relations with Serbia without the consent of the Sobranje. The last step taken was the sentencing to life imprisonment of six members of the Radoslavoff ministry, April, 1923. As a result of these activities, Lloyd George, at the Genoa conference (1922) gave Stambulisky his support, while in March, 1923, the Reparations Commission, equally convinced of Bulgaria's good intentions, reduced the Bulgarian indemnity to 550,000,000 gold francs.

There was no lack of opposition at home, as was to have been expected. Anti-Stambulisky outbreaks occurred frequently during 1922 and, in September, street fighting in Sofia led to 15 deaths and the wounding of over 200. The elections of April, 1923, seemed to indicate that the country wholeheartedly supported the Agrarian cabinet, since 212 Agrarians, 16 Communists, and 15 Bourgeois were returned; but that any hope for continued domestic peace and sanity was illusory was shown when, on the morning of June 9, 1923, a *coup d'état* overthrew the government, forced the arrest of all the ministers except Stambulisky, who was absent from the capital, and set up a bourgeois bloc ministry headed by M. Tsankoff. Stambulisky himself was tracked down and killed five days later; the Sobranje was dissolved; and with the recognition of the revolutionary government, first by King Boris, and later (June 27) by the Little Entente, the revolution was complete.

An indication of the temper of the new Government was shown by the insistence with which it made demands upon the Lausanne Conference of 1923 for an outlet to the Aegean by way of the Maritza Valley and the port of Dedeagatch, and the refusal of the treaty commissioners to comply resulted in the familiar sabre-rattling, so characteristic of old Bulgaria. Throughout the year, affairs were turbulent. The Government attempted a diversion by attacks on the Communists, 95 of whom were brought to trial in July for counter-revolutionary agitation; while Agrarians and Communists retaliated by disorders and riots, even going so far as to seize and hold several towns in the northeast (Sept. 1923). The rising was short-lived

though the Government did not cease its repressive actions, and this in spite of the presumably popular victory which it obtained at the polls, November 18, when the bourgeois parties gained 185 seats against the opposition's 62. Where once there had been confidence, now was to be found suspicion: Bulgaria again became the storm-centre of Balkan intrigue and recriminations. Jugo-Slavia, Rumania, and Greece looked askance at Bulgaria's request for permission to employ conscription in the recruiting of the army; Bulgaria, Serbs charged, had become the stamping ground of Macedonian anti-Serb propaganda; from Greece came the demand that the recruiting of bands near the Thracian frontier cease.

In internal affairs, the continued activities of the Communist-Agrarian alliance could not be broken up, in spite of the high-handed actions of the Government. In 1924 and 1925 these activities blazed out in continual riots and depredations. On Aug. 21, 1924, General Todor Alexandroff, famous leader of the Internal Macedonian Revolutionary Organization, was assassinated by members of that body, the murder leading to other killings in reprisal. On Apr. 16, 1925, following a series of political murders and an unsuccessful attempt on the life of King Boris, the seething ferment beneath the surface burst out in an outrage which shocked the civilized world. At the funeral of General Gheorghiev, slain two days before, a bomb was exploded in the crowded cathedral of Sveta Nedelia at Sofia, killing more than 120 people and wounding hundreds. The government acted promptly. Martial law was declared, thousands of suspects were arrested, and a number of persons were convicted of conspiracy and hanged. The Council of Ambassadors approved a temporary increase in the country's armed forces. On May 4 the government outlawed all communists and announced that their organizations would be destroyed.

The severe measures adopted put a stop to anti-government violence. Nevertheless it was felt that this violence had been due to the strong repressive policies of the Tsankoff government and that a more moderate rule would be beneficial. On Jan. 3, 1926, Professor Tsankoff resigned and was succeeded by M. Liaptcheff, leader of the more radical wing of the Democrats. He immediately initiated a policy of moderation by obtaining the passage of a general amnesty bill. Many liberties were restored, and in a short time, impressed by the sincerity of his conciliatory measures, the country for a while became comparatively quiet. Among the problems that demanded solution at this time was that caused by the influx of great numbers of political refugees, mostly from Macedonia and Thrace. These destitute people, driven from their homes by persecution or dispossessed to make way for the Greeks deported by Turkey, kept thronging across the border until their total mounted to a quarter million or more. In 1926 the Government found it necessary to apply for a loan to the League of Nations. In September, the League Council finally approved a loan of £2,250,000, against which the Bank of England advanced £400,000 for immediate use in relieving the refugees.

In foreign affairs, the period was marked by almost constant friction with Bulgaria's neighbors, extending over many years. In October, 1925, Greek forces at Saloniki advanced into Bulgarian territory as a result of an attack by



Bulgarian guerrillas on a Greek frontier post on October 19. Instead of resisting Bulgaria laid the case before the League of Nations, which on October 26 ordered the immediate withdrawal of the Greek forces, and later directed the payment by Greece of an indemnity of 30,000,000 leva.

In 1925 a treaty of friendship was signed with Turkey and was ratified the following year, although the opposition to it was bitter because of the provisions relating to the property of pre-war Bulgarian refugees. Far more serious as an apparently endless source of trouble, both internal and external, were the activities of the powerful Macedonian revolutionaries in Bulgaria, particularly as reflected in the raids of bands of *comitadj*i across the Jugo-Slav and Rumanian borders. Both Jugo-Slavia and Greece had acquired parts of Macedonia, and it was for the purpose of uniting the Macedonians in these countries and Bulgaria into an autonomous state that continual agitation was carried on. It was inspired by the I.M.R.O. (Internal Macedonian Revolutionary Organization) and other secret societies operating in Bulgaria. There were frequent political assassinations, and these organizations were at least partly responsible for the numerous raids across the frontier by the *comitadj*i or irregular bands operating in the wild mountainous border country where they were almost immune from capture by government troops.

In 1926 tension with Jugo-Slavia almost approached the point of war. On August 11, that country joined with Rumania and Greece in a joint note of protest, but it failed to bring satisfactory action by Bulgaria. Aside from the Macedonian difficulties the year 1927 was comparatively quiet. The general elections in May were marked by less government control than usual, but they resulted nevertheless in increased support for the government, which counted 175 followers in Parliament, as against 141 before. In the latter part of the year continued *comitadj*i attacks, resulting, among other violences, in the murder of a Jugo-Slav general in charge of a frontier garrison, brought serious tension again. But the tone of the Jugo-Slav protest was moderate and when Bulgaria declared martial law in the troubled districts and took other strong measures, the threatened crisis was averted. It was charged, not proved, that Italian influence was encouraging the attacks on Jugo-Slavia.

On July 8, 1928, the Macedonian question flamed up also in domestic disorders when General Protogeroff, leader of the I.M.R.O., was assassinated by an ambitious rival in the organization. The country then witnessed a bloody warfare between two factions in which street fighting in the capital itself became common. Great Britain and France joined in urging repressive measures against the I.M.R.O. and the resignation of its cabinet supporter, General Volkoff, Minister of War. General Volkoff retained his position until the close of the year, but early in 1929 he resigned and was appointed Minister to Italy.

The year 1928 was marked also by the floating of another foreign loan to which the League of Nations gave its consent on March 15. The amount was for £500,000 and was placed in England and the United States and on the Continent by the end of November. As one of the conditions of the agreement with the League the National Bank was changed into a private joint-stock bank. M. Gheorghieff, Minister of Railways, resigned in protest at the change. In the

latter part of April, very violent earthquakes shook southern Bulgaria resulting in damage amounting to millions of dollars and in much loss of life. The year 1929 opened with promise of improved relations with Bulgaria's neighbors. Frontier raids were much less in evidence and in April Bulgaria and Jugo-Slavia concluded an agreement whereby the latter country was again opened to Bulgarian subjects, who had been barred when the disorders were at their height.

**BULGARIAN LITERATURE.** The misfortunes of Bulgaria in the Balkan Wars and later in the World War cast a deep gloom over the intellectual life of the country. In 1921 Ivan Vazov, the foremost writer, died. His long career had extended over the entire history of modern Bulgarian literature and he had worked in practically every style. An outstanding figure, he was deeply mourned by his nation. The younger authors fall into two main groups. There are mystical and symbolistic writers, as Ivan Grozev and Nikolay Raynov, who stress either pure art or a mystical escape from an oppressive reality, Grozev especially interesting himself in the mediæval Bogomils and their unusual beliefs. Others, as Yordan Yovkov, describe realistically the life of the villagers in the Dobrudja or still others, as Angel Karaliychev, illustrate the life of the peasant in an almost expressionistic manner. There is much activity in the literature but as in the case of many of the other Slavonic literatures, the new tendencies appearing since the War have not been able to work themselves out and it is possible only to guess at the progress of the development.

**BULKLEY L(VUCUS) DUNCAN** (1845-1928). An American dermatologist and physician born in New York (see VOL. IV). He was largely responsible for the organization of the New York Skin and Cancer Hospital and was one of the founders of the American Dermatological Association. His natural interest in the subject of malignant tumors led him to devote his attention entirely to the study of their non-surgical treatment. His later works, in which he set forth the results of his investigations, were *Cancer: Its Cause and Treatment*, 2 vols. (1915-16); *The Medical Treatment of Cancer* (1919); *Cancer and Its Non-Surgical Treatment* (1921), and *Cancer of the Breast* (1924). He established a quarterly periodical, *Cancer*, in 1924.

**BULLARD, ARTHUR** ("Albert Edwards") (1879-1929). An American author, born at St. Joseph, Mo., and educated at Blair Presbyterian Academy and Hamilton College (Clinton, N. Y.). As foreign correspondent, he was connected with *Harper's Weekly*, *Collier's Weekly*, *The Outlook*, *Atlantic Monthly*, etc. In 1917-19 he was a member of the committee on public information and subsequently director of its Russian and Siberian divisions. He was special assistant to the Department of State for work in the Russian Division, 1919-21, and for the following three years, editor of *Our World*. He was a member of the secretariat of the League of Nations, 1926-27, and was attached to the American delegation to the International Economic Conference at Geneva in 1927. Among his works are *The Diplomacy of the Great War* (1915); *Mobilizing America* (1917); *The Russian Pendulum* (1919); *The Stranger* (1920); and *A B C's of Disarmament and Pacific Problems* (1921).

**BULLARD, ROBERT LEE** (1861- ). An American army officer, born in Youngsboro, Ala.

He graduated from the United States Military Academy in 1885 and was appointed second lieutenant in the same year. During the Spanish-American War, he served as colonel of the 3d Alabama Infantry. In 1889 he was commissioned colonel of volunteers in the Army, and in 1902, following his discharge from the Volunteer Service, became a major in the Regular Army. He was promoted to be colonel in 1911 and brigadier general in 1917. He commanded the 2d Brigade of the 1st Division in France in June, July, and August, 1917, and in the last month was appointed major general in the National Army. He commanded the 1st Division in all its engagements and operations against the Germans, from December, 1917, to July, 1918. He was promoted to the rank of lieutenant general in 1918 and major general of the Regular Army in November of the same year. From October, 1918, to April, 1919, he commanded the 2d Army. He was awarded the Distinguished Service Medal and was decorated by France, Belgium, and Italy. He was appointed commander of the Department of the East in 1921. On Jan. 15, 1925, he was retired. Since that year, he has been president of the National Security League.

**BULLOCK**, bul'lok, SHAN F. (1865- ). An English novelist (see VOL. IV). His recent books are *The Making of a Soldier* (1916), *Mr. Ruby Jumps the Traces* (1917), *Mors et Vita* (1923), *The Loughsiders* (1924), and *Gleanings* (1926).

**BULOW**, bu'lô, BERNHARD HENDRICK KARL MARTIN, PRINCE VON (1849- ). A German statesman (see VOL. IV). Having been very active in furthering the German policy previous to the World War, von Bulow was given temporary charge of the German Embassy in Rome on Dec. 19, 1914, to try to smooth over the differences between Austria-Hungary and Italy. He was unsuccessful and Italy declared war on May 23, 1915. He is the author of *Imperial Germany*, a book defending his own foreign policy. It was translated into English in 1914, and a revised edition, omitting many compromising passages, appeared in 1916.

**BUMPUS**, HERMAN CAREY (1862- ). An American educator (see VOL. IV). He resigned as president of Tufts College in 1919 and in the same year held the chairmanship of the Massachusetts Security League. Since 1924 he has been secretary of the corporation of Brown University and since 1925 consulting director of the Buffalo Museum of Science.

**BUMSTEAD**, HENRY ANDREWS (1870-1920). An American physicist, born at Pekin, Ill., and educated at Johns Hopkins and Yale. He was instructor in physics and assistant professor in the Sheffield Scientific School of Yale, 1893-1906. He left Yale in 1906 to become full professor at the Sloane Physical Laboratory. He also became director of the latter, a place which he held until his death. During the World War, he was a scientific attaché of the United States Embassy in London (1918-19). He was connected with the National Research Council (1920). His scientific researches included studies on radioactive gas in water and on atmospheric radioactivity, as well as on the effects produced by röntgen rays in different metals. He also published a series of papers on the emission of electrons by metals under the influence of alpha rays.

**BUNDY**, OMAR (1861- ). An American army officer, born in Newcastle, Ind. He graduated from the United States Military Academy in 1883 and rose through the various grades, becoming colonel of the 16th Infantry in 1914 and adjutant general in 1915. His earlier service included campaigns against the Indians and in the Spanish-American War. He served in the General Staff College from 1902 to 1905. In 1917 he was appointed brigadier general and, later in the year major general of the National Army. From October, 1917, to July, 1918, he commanded the 2nd Division of the American Expeditionary Forces in France; in 1918 he commanded the 6th and 7th Army Corps. At the close of the War, he was appointed major general of the Regular Army and was given command of the Philippine Department in 1922. In 1924-25 he was commander of the 5th Corps area. He was retired on June 17, 1925.

**BUNIN**, IVAN A. (1870- ). A Russian poet and novelist, born at Voronezh, who followed the older classic tradition. He made his début about 1905, with a volume of short stories and poems, becoming a stabilizing force in Russian literature, which had run wild under the influence of the decadents and the early revolution. In exile in Paris after the revolution, he describes that event with vivid realism. His works include various collections of poems (1886-1915); *The Village*, a novel (1910, Eng. tr. 1923); *The Temple of the Sun* (travel sketches); *The Gentleman from San Francisco*, short stories, (1917); *The Cry*, stories (1921); *The Dream of Chang*, stories (1923); *The Sacrament of Love*, a novel (1925); *The Cicadas*; *The Rose of Jericho*, poems and stories; *Mitya's Love*, a novel (1926); *The Life of Arseniev* (1928); and translations of Byron, Tennyson, and Longfellow. With Gorky and Kuprin, he wrote *Reminiscences of Anton Chekhov* (trans. 1921).

**BUNZELL**, HERBERT HORACE (1887- ). An American chemist, born near Prague, Czechoslovakia. In 1903 he removed to the United States and in 1906 graduated from the University of Chicago. He did graduate work at that institution and in Berlin and later became an expert with the United States Department of Agriculture (1910-11) and chemical biologist in the same department, (1911-16). He served for several years on the faculty of Georgetown University and in 1917-18 was professor and head of the chemistry department at the University of Cincinnati. He has been professor of chemistry at the Woman's Medical College of Pennsylvania since 1920 and also has practiced as consulting chemist. He contributed numerous papers to chemical journals and was a member of several scientific societies.

**BURBANK**, LUTHER (1849-1926). An American naturalist (see VOL. IV). He continued his experiments at the Burbank Experiment Farms at Santa Rosa, Calif. There he evolved many new varieties of fruits and flowers, including new apples, peaches, nuts, berries, and valuable trees. On these farms, he had over 5000 distinctive botanical specimens from all parts of the world, and over 1,000,000 plants were raised every year for testing. He was special lecturer on evolution at Leland Stanford, Junior, University. He wrote *Training of the American Plant*; *Luther Burbank, His Methods and Discoveries*; and *How Plants Are Trained to Work for Man* (1921).

**BURGENLAND**, böör-gén'länd'. The problem which this region, sometimes known as German West Hungary, presented in the peace settlement, after the World War, was unusual in involving the transfer of territory from one enemy country, Austria, to another, Hungary. The Burgenland, lying on the frontier between Austria and Hungary and including parts of the three Hungarian counties of Vas, Sopron, and Moson, has an area of 1532 square miles and a population of 285,609. Ethnical divisions were: Germans, 215,000; Croats and Wends, 45,000; Magyars, 15,000; Jews and others, 10,000. On the grounds of race, therefore, the validity of the Austrian claims before the Peace Conference were obvious. Other considerations were favorable to the transfer and it is likely that some of these bore more weight with the Supreme Council than the matter of ethnography. It was pointed out that the Burgenland was "the kitchen garden of Vienna" and that its separation from the city by an international boundary would entail distinct hardships. Again, the territory would serve as an excellent buffer region between the two states, an important desideratum in view of the establishment of the Bolshevik régime of Béla Kun in Hungary. Therefore, on July 20, 1919, the Peace Conference decided to cede the Burgenland to Austria without a plebiscite. Throughout 1920 Hungary remained in control and as negotiations regarding the cession yielded no definite results, tension increased. The advent of reaction in Hungary under Horthy complicated matters. It was maintained that the Burgenland was one of the richest regions of the former kingdom and that 30 per cent of its population had been engaged in various manufacturing establishments vital to the economic life of Hungary. There were located coal mines and stone quarries as well as the city of Sopron (Oedenburg), the centre of a great carrying trade of cattle and foodstuffs. It was becoming plain that Hungarians would not relinquish the region without a struggle. In August, 1921, irregular troops, of the party of ex-premier Friedrich and the reactionary society known as "The Awakening Hungarians," poured into the country and forcibly ejected the Austrian officials who had appeared to take possession in accordance with the provisions of the Treaty of the Trianon. Austria, by this time, had become more than eager for the cession; Hungary, for her part, stubbornly maintained her rights to the eastern portion and refused to move against the armed bands. In September, Czechoslovakia, for the Little Entente, appealed to the Allies in behalf of Austria. On September 25, the Council of Ambassadors demanded the withdrawal of Hungarian troops, meanwhile, at the behest of Italy, refusing to permit Czechoslovakia and Jugoslavia to interfere. Largely as a result of Italian intervention, a truce was patched up, October 13, by which Hungary promised to clear the counties of the predatory bands and hand over the Burgenland to Austria, while Austria consented to the holding of a plebiscite in the town of Sopron and its environs. Such a plebiscite was held in December at Sopron and proved favorable for Hungary. On December 30, therefore, Sopron, and those districts contiguous to the Hungarian frontier were turned over to the Hungarian police by an Allied military commission.

**BURGESS**, (FRANK) GELETT (1866- ). An American author and illustrator (see VOL. IV). He is the author of *Burgess Unabridged* (1914), *The Good Encyclopedia* (1915), *The Romance of the Commonplace*, enlarged edition (1916), *War the Creator* (1916), *Mrs. Hope's Husband* (1917), *Have You an Educated Heart?* (1923), *Ain't Angie Awful!* (1923), *The Purple Cow* (1923), *Why Be a Goop?* (1924), and *Why Men Hate Women* (1927).

**BURGESS**, GEORGE KIMBALL (1874- ). An American physicist, born at Newton, Mass. He was graduated in 1896 from the Massachusetts Institute of Technology, where for two years he served as assistant in physics. He then studied in Paris, taught in the Universities of Michigan and California, and in 1903 went to Washington as physicist in the Bureau of Standards, where after successive promotions he became in 1923 director of the Bureau in succession to Dr. S. W. Stratton. Dr. Burgess also served the United States as a member of various foreign-service and engineering commissions of the National Research Council, especially during the World War, and was a member of the National Aircraft Standards Board. The results of his many investigations have been published in a series of papers on the constant of gravitation, on high-temperature measurements, and on the properties of metals and alloys; many of these were issued in the series of technical papers of the Bureau of Standards.

**BURGESS**, JOHN WILLIAM (1844- ). An American university dean (see VOL. IV). In 1914-15 he was visiting American professor in Austrian universities. He is the author of *Causes of the European Conflict* (1914), *The European War of 1914* (1915; popular edition, 1916), *The Reconciliation of Government with Liberty* (1915), *The Administration of President Rutherford B. Hayes* (1915), *America's Relations to the Great War* (1916), *Militarism and the Emperor* (1916), *The Russian Revolution and the Soviet Constitution* (1919), *The Transformation of the Constitutional Law of the United States Between 1898 and 1920* (1921), *Recent Changes in American Constitutional Theory* (1923), and *The Sanctity of Law—Wherein Does It Consist?* (1927).

**BURKE**, BILLIE (MRS. FLORENZ ZIEGFELD, JR.) (1886- ). An American actress, born in Washington, D. C. She made her début in London in support of Edna May in *The School Girl* at the Pavilion Music Hall. She appeared as leading woman in *Mr. George* (1907). In the same year, she came to America and was very successful in her characterizations of Beatrice Dupré, as John Drew's leading woman in *My Wife*. Her later successes in New York were in *Jerry*, *The Rescuing Angel*, *Cæsar's Wife*, *The Intimate Strangers* (1921), *Rose Briar* (1923), *Annie Dear* (1924), and *The Marquise* (1927). She also has devoted much time to the moving pictures.

**BURKITT**, FRANCIS CRAWFORD (1864- ). An English professor and biblical scholar (see VOL. IV). Among his later works are *Jewish and Christian Apocalypses* (Sweich Lectures) (1914), *Some Thoughts on the Athanasian Creed* (1916), *Eucharist and Sacrifice* (1921), *Earliest Sources of the Life of Jesus* (rev. ed., 1922), *The Early Syriac Lectionary System* (1923), and *Christian Beginnings* (1924).

**BURLEIGH**, HENRY THACKER (1866- ). An American singer and song writer, born at

Erie, Pa., In 1892 he entered the National Conservatory in New York City, studying there with Rukin Goldmark, J. White, and M. Spicker. In 1894 he became baritone soloist at St. George's, and in 1899 baritone soloist at the Temple Emanu-El. As a song writer, he justly gained wide popularity. In 1917 he was awarded the Spingarn Medal for the highest achievement during 1916 by an American citizen of African descent. In 1920 Harvard University conferred on him the degree of Doctor of Music.

**BURLESON, ALBERT SIDNEY** (1863- ). An American postmaster general (see VOL. IV). In 1918 he became chairman of the United States telephone and telegraph administration. He retired from the office of postmaster general in 1921.

**BURLESON, HUGH LATIMER** (1865- ). A bishop of the Protestant Episcopal Church, born at Northfield, Minn., and educated at Racine College, Wis., and at the General Theological Seminary in New York City. From 1893 to 1900, he was curate, assistant, or rector of Protestant Episcopal churches in New York and Wisconsin. During the seven years following, he was dean of the Cathedral of the District of North Dakota, and in 1909-16, secretary of the Board of Missions of the Protestant Episcopal Church of the United States. In the latter year, he became bishop of South Dakota. He wrote *The Conquest of the Continent* (1911) and *Our Church and Our Country* (1918).

**BURLIN, NATALIE CURTIS** (1875-1921). An American writer born in New York City. She studied music in France and Germany and devoted herself particularly to the collection of folk-songs of Indian tribes, traveling widely among them for that purpose. She made similar studies among the Zulu and other tribes of South Africa and among American Negroes. In 1917 she married the artist, Paul Burlin. Among her writings, which relate chiefly to primitive music in America and Africa, are *Songs of Ancient America* (1905), *The Indians' Book* (1907), *Hampton Negro Folk Songs* (1918), and *Songs and Tales from the Dark Continent* (1920).

**BURNET, JOHN** (1863-1928). A Scottish classical scholar (see VOL. IV). In 1919, he became Associate of the Royal Academy of Belgium and in the same year was also made Honorary Fellow of the Educational Institute of Scotland. In 1925 he went to the United States as Sather Professor in Classical Literature at the University of California. He retired from active work when he was made professor emeritus of Greek at St. Andrews (1926). He is author of *Greek Philosophy: Thales to Plato* (1914), *The Socratic Doctrine of the Soul* (1916), and *Higher Education and the War* (1917). His *Early Greek Philosophy*, which reached its third edition in 1920, was translated into German (1913) and French (1919).

**BURNET, SIR JOHN JAMES** (1857- ). A British architect, born at Glasgow, where he attended the Collegiate and Western Academy, later studying in Paris at the Ecole des Beaux Arts. He has designed various types of buildings, but his most important work has been with public structures, including, in Glasgow, the Royal Institute of Fine Arts, and the extensions to the University and Western Infirmary, and, in London, the King Edward VII Galleries of the British Museum Extension, and the building of the Institute of Chemistry, London. He was

knighted in 1914, won the gold medal of the Royal Institute of British Architects in 1923, and was elected a fellow of the Royal Academy in 1925.

**BURNETT, FRANCES (ELIZA) HODGSON** (1849-1924). An American author (see VOL. IV). After 1914 she added to her already long list of works *The One I Knew Best of All* (1915), *Little Hunchback Zia* (1916), *White People* (1917), *Good Wolf* (1919), *The Head of the House of Coombe* (1922), *Robin* (sequel to *The Head of the House of Coombe*, 1922), and others. In addition to her writing she edited *The Children's Book* (1914).

**BURNHAM, CLARA LOUISE** (1861-1927). An American author, born at Newton, Mass. She wrote many stories and poems for the magazines and the text for many of her father's cantatas. Among her novels were *Dr. Latimer* (1893); *The Right Princess* (1902); *Jewel* (1903); *Jewel's Story Book* (1904); *The Opened Shutters* (1906); *The Leaven of Love* (1908); *The Inner Flame* (1912); *The Right Track* (1914); *Instead of the Thorn* (1916); *Hearst's Heaven* (1918); *In Apple-blossom Time* (1919); *The Keynote* (1921); *The Queen of Farrandale* (1923); *The Lavarous* (1925); and *Tobey's First Case* (1926). She was a Christian Scientist and most of her books are permeated with the principles of that faith. She was notably successful in depicting New England characters.

**BURNHAM, HARRY LAWSON WEBSTER LAWSON, 1st. VISCOUNT** (1862- ). An English peer, born in London. He attended Balliol College, Oxford. A Unionist, he represented various constituencies in Parliament at intervals between 1885 and 1916. He was a member of the London County Council (1889-92, 1897-1904) and was Mayor of Stepney (1908-09). Since 1916 he has been president of the Empire Press Union. He was also president of the International Labor Conferences at Geneva (1921-22, and 1926); of the Imperial Press Conferences at Ottawa (1920), and Melbourne (1925); and of the Public Health congresses at Bordeaux (1924) and Ghent (1927). He served on the Indian Statutory Commission (1927-28). Viscount Burnham has received numerous honorary degrees, and European decorations, including the Legion of Honor. He was created a baronet in 1892, a baron in 1903, a Companion of Honour of the British Empire, 1917, a Viscount in 1919, and a Knight of the Grand Cross of St. Michael and St. George in 1927.

**BURNS, JAMES ALOYSIUS** (1867- ). A Roman Catholic clergyman and college president, born at Michigan City, Ind., and educated at the University of Notre Dame. After two years spent as a lay teacher, he was ordained to the Roman Catholic priesthood in 1893 and from that time until 1900 was professor of sciences in the University of Notre Dame. He was then made president and professor of moral theology in Holy Cross College (Washington). In 1919 he returned to the University of Notre Dame as president for three years. He became provincial superior of the Congregation of the Holy Cross in the United States in 1927. His publications include *Principles, Origin and Establishment of the Catholic School System* (1908); *The Growth and Development of the Catholic School System* (1912), and *Catholic Education: A Study of Conditions* (1917).

**BURNS, Rt. Hon. JOHN** (1858- ). An English member of Parliament (see VOL. IV).

In 1914 he resigned from the presidency of the Local Governmental Board and became president of the Board of Trade. He resigned from the latter office when war was declared. He held his seat in Parliament as a Labor member until 1918.

**BURNS, KEVIN** (1881- ). An American spectroscopist, born at Pleasant Ridge, N. B. He was graduated at the University of Minnesota in 1903. He was connected with the Lick Observatory during 1904-07 and again as a Martin Kellogg fellow during 1910-12. In 1913 he was a physicist at the Bureau of Standards (Washington), but in 1920 he became the astronomer at the Allegheny Observatory. His specialty is the application of the spectroscope to heavenly bodies, the orbit of lambda Andromedæ, the ring nebula in Lyra, and the Orion region, on which he has published his findings.

**BURR, GEORGE LINCOLN** (1857- ). An American professor (see Vol. IV). He was John Stambaugh professor of history in Cornell University, 1919-22. He edited *Narratives of Witchcraft Cases* (1913).

**BURR, WILLIAM WESLEY** (1880- ). An American agriculturalist, born at Goodland, Ind. He graduated from the University of Nebraska in 1906 and until 1913 was associate professor of crops and soils there. From 1903 to 1913, he was also in charge of the cooperative work in the office of dry-land agriculture in the North Platte Experiment Station, Bureau of Plant Industry, United States Department of Agriculture. From 1913 to 1916, he was assistant agriculturist and from the latter date professor of agronomy and head of the department at the University of Nebraska. He was also vice-director of the experiment station of that university. He was a member of several scientific societies and wrote on soil moisture, crop production, dry-land agriculture, etc.

**BURRAGE, CHAMPLIN** (1874- ). An American scholar born at Portland, Me., and educated at Brown University and at Berlin, Marburg, and Oxford. From 1912 to 1915, he was librarian of Manchester College, Oxford, and from 1915 to 1917, librarian and member of the faculty of Brown University. He made archaeological investigations in Crete in 1926 and 1927. His publications include *A New Year's Gift by Robert Browne, 1588* (1904); *The Church Covenant Idea* (1904); *The True Story of Robert Browne* (1906); *New Facts Concerning John Robinson* (1910); *The Early English Dissenters in the Light of Recent Research* (1912); *John Penry, the So-Called Martyr of Congregationalism* (1913); *Nazareth and the Beginnings of Christianity* (1914); *John Pory's Lost Description of Plymouth Colony* (1918); *An Answer to John Robinson of Leyden* (1920); *The Minoan Hieroglyphic Inscriptions, I: The Phaistos Whorl* (1921), and *Prehistoric Aegean Inscriptions from Minoan Crete, the Aegean Islands, Cyprus, Greece and Troy, Part I* (1922).

**BURRELL, DAVID JAMES** (1844-1926). An American clergyman (see Vol. IV). He is the author of *We Would See Jesus* (1914), *The Apostles' Creed* (1915), *Why I Believe the Bible* (1917), *The Laughter of God* (1918), *Campaigns of Paul* (1919), *The Resurrection and the Life Beyond* (1920), *Paul's Companions* (1921), and *Paul's Letters* (1921).

**BURRELL, MARTIN** (1858- ). Secretary of State of Canada and Minister of Mines,

1917-19 (see Vol. IV). In 1920 he became Parliamentary Librarian of Canada.

**BURROUGHS, JOHN** (1837-1921). An American essayist and naturalist, born at Roxbury, N. Y. (see Vol. IV). His writings in his later years took on a wider aspect than his earlier books and were devoted largely to a general study of life and its meaning. In 1913 he published *The Summit of the Years*; in 1915, *The Breath of Life*; in 1916, *Under the Apple Trees*; in 1919, *Field and Study*; and in 1920, *Accepting the Universe*. John Burroughs died on March 29, 1921, and was buried at Roxbury, near his Catskill lodge. Consult *The Heart of Burroughs* (1928), edited by Clara Barrus, which includes his diaries and letters.

**BURSTING CHARGES.** See **EXPLOSIVES**.

**BURT, CYRIL LODOWIC** (1883- ). An English psychologist and physiologist. He attended Jesus College, Oxford, and Würzburg University, and in 1908 returned to Oxford as the John Locke scholar in mental philosophy. He lectured on experimental psychology and physiology at the University of Liverpool (1909-13), and in the psychological laboratory of Cambridge (1912-13). After 1913 he was psychologist to the London County Council, of the Education Department, and after 1924 professor of education at the University of London. In 1923 he was president of the psychological section of the British Association for the Advancement of Science. He contributed articles to various periodicals, and wrote: *The Distribution of Educational Abilities* (1917); *Mental and Scholastic Tests* (1921); *Handbook of Tests* (1923); and *The Young Delinquent* (1925).

**BURTON, ERNEST DEWITT** (1856-1925). An American theologian and university president (see Vol. IV). He was president of the University of Chicago, 1923-25. He was the author of *Harmony of the Synoptic Gospels in Greek*, with Edgar J. Goodspeed (1920); *Commentary on Paul's Epistle to the Galatians* (1920); *Jesus of Nazareth, How He Thought, Lived, Worked, and Achieved* (1920); and *Source Book for the Study of the Teaching of Jesus in Its Historical Relationships* (1923).

**BURTON, MARION LE ROY** (1874-1925). An American University president (see Vol. IV). In 1917 he resigned as president of Smith College (Northampton, Mass.), to accept the presidency of the University of Minnesota. He stayed in the latter institution until 1920, when he became president of the University of Michigan. His works include *Life Which Is Life Indeed* (1914), *First Things* (1915), and *On Being Divine* (1916), and various articles and annual reports.

**BURTON, RICHARD EUGENE** (1861- ). An American college professor (see Vol. IV). He resigned his professorship at the University of Minnesota in 1925, to devote his attention to literary work. His works include *How to See a Play* (1914), *Bernard Shaw—the Man and the Mask* (1916), *Poems of Earth's Meaning* (1917), and *Charles Dickens—How to Know Him* (1919). He was president of the Drama League of America, (1914-15).

**BURTON, THEODORE ELIJAH** (1851- ). An American Congressman (see Vol. IV). He served as a member of Congress (1921-29) for the 22d District of Ohio. In 1928 he was elected to the U. S. Senate for the term expiring in 1933. He was a member of the Foreign Debt Commission, 1922-27, and chairman of the United States



delegation to the Conference for Control of Traffic in Arms at Geneva in 1925. He has been president of the American Peace Society since 1925. He had the unanimous support of the Ohio delegation for presidential nominee in the Republican national convention in 1916. From 1917 to 1919, he was president of the Merchants' National Bank of New York City, and in the latter year he was also Stafford Little lecturer at Princeton University. His works include *Some Political Tendencies of the Times and the Effect of the War Thereon* (1910) and *The Constitution, Its Origin and Distinctive Features* (1923).

**BURTON, WILLIAM MERIAM** (1856- ). An American chemist, born at Cleveland, Ohio, and educated at Western Reserve and Johns Hopkins universities. In 1889 he entered the service of the Standard Oil Company of Indiana, as chemist, and after serving as superintendent and vice president was its president, 1918-27. His important investigations have had to do with the technology of petroleum, notably a "cracking" process which has doubled the output of gasoline. The Willard Gibbs Medal of the American Chemical Society was conferred on him in 1918 and in 1922 he received the Perkins Medal of the Society of Chemical Industry.

**BURY, SIR GEORGE** (1866- ). A Canadian railway official born in Montreal. He was educated at Montreal College and in 1883 entered the employ of the Canadian Pacific Railroad. In 1907 he was made general manager of its Western lines and from 1911 was vice president of the road. In 1917 he visited Russia to assist in the reorganization of shipping in that country. In the same year he was knighted.

**BUSCH, bush, ADOLF** (1891- ). A German violinist and composer, born at Siegen, Westphalia. He received his first instruction from his father, and made such rapid progress that at the age of eleven he was admitted to the advanced class of Willy Hess at the Cologne Conservatory. After graduation, in 1908, he studied composition under Hugo Grütters in Bonn. In 1912 he became concert-master of the Konzertverein in Vienna, succeeded Marteau, in 1918, as principal professor of violin at the Hochschule für Musik in Berlin, and in 1926 took up his residence in Basel. In 1907 he met Reger, who was so impressed with the young man's art that, whenever possible, Busch played first violin in Reger's chamber-music compositions. This close association explains the fact that Busch's earlier compositions are little more than imitations of Reger's style. In 1919 Busch formed his own string quartet with Karl Reitz, Emil Bohnke, and Paul Grümmer, Reitz and Bohnke being later succeeded by Gösta Andreasson and Karl Doktor. Both as soloist and ensemble player, Busch ranks among the very greatest. His works include two symphonies, in E minor and D minor; two overtures, *Lustspiel* and *König Ödipus*; a violin concerto in A minor; a piano concerto in C; a *Fantasy* for cello and orchestra, and a great many chamber-music compositions.

**BUSCH, CARL** (1802- ). An American composer and conductor, born at Bjerre, Denmark. After completion of his studies at the Conservatory in Copenhagen, he spent a year in Paris as viola player in Godard's orchestra. In 1887 he settled in Kansas City, where in 1912 he founded the Kansas City Symphony Orchestra, which he still conducts (1929). He frequently appeared with other orchestras in the United

States, Germany, and Denmark, as conductor of his own works. His works include a symphonic prologue, *The Passing of King Arthur*; a symphonic poem, *Minnehaha's Vision*; *Ode to France*, and *Negro Carnival* for orchestra; a symphony in C; two orchestral suites; *A Chant from the Great Plains* for military band; *Sir Galahad* for baritone, chorus and orchestra; and nine cantatas.

**BUSCH, FRITZ** (1890- ). An eminent German conductor, brother of Adolf Busch, born at Siegen, Westphalia. After completing his studies at the Cologne Conservatory under Steinbach, Boettcher, and Klauwell, he began his career as conductor and chorus director at the Stadtheater in Riga in 1909. After one year as conductor of the Musikverein in Gotha, he succeeded Schwickerath, in 1912, as municipal music director at Aix-la-Chapelle, and then was called to succeed Schillings, in 1918, as first conductor at the opera in Stuttgart, where he was made artistic director the next year. In 1922 he succeeded Fritz Reiner in a similar capacity in Dresden. When, after an interruption of ten years, the Bayreuth Festivals were resumed in 1924, he conducted the *Ring des Nibelungen*. In 1927 he was in the United States as guest-conductor of the New York Symphony Orchestra. In 1928 he conducted in Dresden the première of Richard Strauss's *Die ägyptische Helena*.

**BUSCH, JOSEPH FRANCIS** (1866- ). A Roman Catholic bishop, born at Red Wing, Minn., and educated at Innsbruck, Austria, and at the Catholic University (Washington, D. C.). Ordained to the Roman Catholic priesthood in 1889, he became secretary to Archbishop Ireland and assistant pastor in St. Paul, Minn., then pastor in South St. Paul, Minneapolis, and LaSueur, Minn. In 1910 he became Bishop of Lead, S. D., and in 1915 Bishop of St. Cloud, Minn.

**BUSH, BENJAMIN FRANKLIN** (1860-1927). An American railway official, born in Wellsboro, Pa., and educated at the State Normal School at Mansfield, Pa. He began his railway service on the Northern Pacific Railroad in 1882. In 1887 he was appointed division engineer of the Union Pacific Railroad in Idaho and Oregon. He served as general manager and superintendent of several railroads in the West and was president and receiver of the Western Maryland Railroad, 1907-11. He held the same offices in the Missouri Pacific Railroad, 1911-27. He was president also of the Denver & Rio Grande Railroad in 1912-15, and held several important government offices and was a member of the advisory board on fuels and structural material in 1907. During the World War, he acted as regional director in the southwestern district for the Federal railroad administration.

**BUSTAMANTE, ANTONIO S. DE** (1865- ). A Cuban jurist and professor of international law, who was educated at the Jesuit Colegio de Belén, Havana. He was professor of public and private international law at the University of Havana after 1891, Senator (1902 and 1908-18), president of the Cuban delegation to the Hague Peace Conference (1907), Cuban plenipotentiary to the Paris Peace Conference (1919), a member of the Permanent Court of Arbitration (1908- ), and a judge of the Permanent Court of International Justice. His principal works are *Programas de las Asignaturas de Derecho Internacional Público y Privado*; *El Orden Público*; *Estudio de Derecho Internacional Privado*; *Le Canal de Panama et le Droit International*.

**BUTLER, HENRY MONTAGU** (1833-1918). An English educator (see VOL. IV). He published a volume of classical verse, *Leisure Hours of a Long Life* (1914).

**BUTLER, HOWARD RUSSELL** (1856- ). An American artist who was the founder (1889) and president (1889-1906) of the American Fine Arts Society. He won the Carnegie Prize from the National Academy of Design (1916) and the prize from the Duxbury Exhibition in 1917. He accompanied the United States Naval Observation Expedition to Baker, Oreg., and painted the solar eclipse of June, 1918. He also painted the solar eclipses of Sept. 10, 1923 (California) and Jan. 24, 1925 (Middletown, Conn.).

**BUTLER, NICHOLAS MURRAY** (1862- ). An American educator, president of Columbia University (see VOL. IV). He continued to take an active part in educational and political affairs. In 1914 he became president of the France-America Society, and in 1919 corresponding member of the Academy of Arts and Letters of Naples. In 1917 he was president of the American Hellenic Society. He was mentioned as a possible candidate for the presidency in 1920 and received several votes in the National Convention. In May, 1924, he created a nationwide sensation by a speech delivered at a dinner of the Missouri Society, in which he denounced the Prohibition Constitutional Amendment, and declared that it should be repealed. He expressed like sentiments at the National Republican Convention of 1928. He was a member of the Commission on the Reorganization of the N. Y. State Government, 1925-26, and vice chairman of the Mayor's New York City Committee on Plan and Development, 1926-27. He became president of the Carnegie Endowment for International Peace in 1925, and was reelected in 1929. His later publications include *The Meaning of Education* (1915); *The World in Ferment* (1917); *Is America Worth Saving? and Other Addresses* (1920); *Scholarship and Service* (1921); *Building the American Nation* (1923); and *The Faith of a Liberal* (1924).

**BUTLER, PIERCE** (1866- ). An American jurist. He was born in Dakota County, Minn., graduated at Carleton College (1887), and was admitted to the bar in 1888. He was county attorney of Ramsey County (1893-97) and later was general attorney of the Chicago, St. Paul, Minneapolis & Omaha Railway (1899-1905). Resuming general practice, he acted as counsel in several important Canadian railway cases. He was a member of the Board of Regents of the University of Minnesota (1907-24). In November, 1922, he was appointed an Associate Justice of the United States Supreme Court by President Coolidge.

**BUTTENWEISER, MOSES** (1862- ). An American scholar, born at Beerfelden in Germany and educated at the universities of Würzburg, Leipzig, and Heidelberg. In 1897 he became professor of Biblical exegesis in the Hebrew Union College of Cincinnati, Ohio. His works include *The Hebrew Elias-Apocalypse*, in German (1897); *An Outline of Neo-Hebraic Apocalyptic Literature* (1901); *The Prophets of Israel* (1914); *The Book of Job* (1920); *The Importance of the Tenses for the Interpretation of the Psalms* (1925); and numerous articles in learned publications.

**BUTTER.** See DAIRYING.

**BUXTON, THE RT. HON. NOEL** (1869- ). An English social reformer and labor leader. He

was educated at Cambridge and acted as aide-de-camp to his father when the latter was Governor of South Australia. He founded a farmers' coöperative society, was an active member of many organizations engaged in social reform work and also of the Christian Social Union. In January, 1924, and again in June, 1929, he was appointed Minister of Agriculture and Fisheries in the Labor cabinets of Ramsay MacDonald. He published *Europe and the Turks* and *With the Bulgarian Staff*, and was joint author of *The Heart of the Empire, Travel and Politics in Armenia, The War and the Balkans, Balkan Problems and European Peace, Oppressed Peoples and the League of Nations*.

**BUXTON, SYDNEY CHARLES BUXTON, FIRST EARL OF** (1853- ). An English statesman (see VOL. IV). He became High Commissioner and Governor General of South Africa in 1914 and was at the same time created Viscount Buxton. In 1920 he retired from office. He wrote, in addition to treatises on economics and finance, *General Botha* (3d ed., 1924).

**BUZZARD, SIR E(RNEST) FARQUHAR, FIRST BARON** (1871- ). An English physician and university professor, born in London. He attended Magdalen College, Oxford, and served his internship at St. Thomas's Hospital, London. In 1906 he was Goulstonian lecturer on acute infective and toxic conditions of the nervous system at the Royal College of Physicians, Ireland. Sir Farquhar subsequently became physician extraordinary to King George V, physician at St. Thomas's Hospital, and consulting neurologist to the Hospital of Diseases of the Throat. In 1928 he was appointed Regius professor of medicine at Oxford. He is a fellow of the Royal College of Physicians, and of the Royal Society of Medicine, and was created a Knight Commander of the Royal Victorian Order in 1927, and a baronet in 1929. He has contributed many papers, chiefly on neurology, to scientific and medical publications.

**BYELY, ANDREY (B. N. BUGAYEV)** (1880- ). Pseudonym of B. N. BUGAYEV, a Russian poet, novelist, and critic, whose writings included many genres and styles. He was gifted in mathematics, philosophy, and music, but neglected these talents for literary symbolism. He began his career in 1904 by a series of philosophical and critical essays in *The Scales* and also by his first volume of collected poetry, entitled *Gold in Blue*. He came to be regarded as the most individual of the Russian modernists. His works include *Symphonies*, symbolic poems in prose; *The Heroic (Northern Symphony)*, 1902; *The Second (Dramatic Symphony)*, 1904; *The Return (Third Symphony)*, 1905; *The Goblet of Snow-Storms (Fourth Symphony)*, 1908; *The Silver Dove*, 1910; *Petersburg*, 1912, novels, parts of a trilogy, the third part, *Kotik Letajev*, appearing in 1918. *Poems*, 1904-17; *Symbolism* (essays on artistic creation), 1910, and *The Star* (1918).

**BYNG, bing, JULIAN (HEDWORTH GEORGE) BYNG, FIRST VISCOUNT** (1862- ). A British general. He saw service in India and South Africa, and in 1909 was made major general. When the British occupied Egypt in 1912, he was placed in charge of the army of occupation. During the World War, he was a corps commander, first in the Dardanelles campaign (1915-16) and then on the Western front, where he was chosen to head the newly formed Canadian Army Corps (1916). In this position, he

was responsible for the celebrated storming of Vimy Ridge (Apr. 9, 1917). In June, 1917, he was raised to the post of army commander, executed the attack on the Cambrai front in November, and was promoted to the rank of full general. In 1919 he was made Baron of Vimy and of Thorpe-le-Soken. From 1921-26 he was Governor General of Canada and, at the close of his term, he became first Viscount Byng. In November, 1928, he became Commissioner of the Metropolitan Police, popularly known as Scotland Yard.

**BYNNER, WITTER** (1881- ). An American author and playwright, born in Brooklyn, N. Y., and educated at Harvard. He is associate editor of *Palms*. His best known work includes *The New World* (1915); *Iphigenia in Tauris* (1915); *Any Girl* (1917); *Grenstone Poems* (1917); *A Canticle of Praise* (1919); *The Beloved Stranger* (1919); *A Canticle of Pan* (1920); *Pins for Wings* (1920, under pseudonym of Emanuel Morgan); *A Book of Plays* (1922); *Caravan* (verse, 1925); *Cake* (play, 1926); *The Pamphlet Poets* (1927). He is co-author with Arthur Davidson Ficke of *Spectra* (1916); and with Julia Ford, of *Snickerty Nick* (1919).

**BY-PRODUCT COKE.** See COKE.

**BY-PRODUCTS. RECOVERY OF.** See CHEMISTRY, APPLIED; FERTILIZERS.

**BYRAM, HARRY E.** (1865- ). An American railway official, born in Galesburg, Ill., and educated in the common schools. He began his railway service with the Chicago, Burlington & Quincy Railroad at the age of 16. He served in several capacities in this company until 1894, when he began service with the Great Northern Railroad as chief clerk in the vice president's office. He filled important positions with several railroads in the Middle and Far West and was appointed general superintendent for Nebraska of the Chicago, Burlington & Quincy in 1904. In 1917 he was appointed president of the Chicago, Milwaukee & St. Paul Railroad. Later, he was made receiver of that road and since the reorganization of the company in 1927, he has been chairman of the board.

**BYRD, RICHARD EVELYN** (1888- ). An American aviator, polar explorer, and member of a distinguished Virginia family, who was born at Winchester and received his schooling in military academies, the University of Virginia, and the U. S. Naval Academy (grad., 1912). Entering the Navy as ensign, he was advanced through the grades to lieutenant commander, but retired in 1916 because of physical disability resulting from an injury to one of his feet. He then went into aviation and after temporary service at Washington in the World War, was placed in command of the U. S. Air Station at Halifax,

N.S., where he was at the date of the Armistice. In 1925 he was in command of the aviation unit of the MacMillan Polar Expedition. In the following year, with Floyd Bennett as pilot, he made the first flight in an airplane over the North Pole and back to the base at Kings Bay, Spitzbergen, covering a distance of 1360 miles in 15½ hours. In June, 1927, with three companions, he flew from New York to the coast of France—a distance of 4200 miles in 42 hours. After his polar flight he was promoted by the Navy to the grade of commander and was presented by President Coolidge with the Hubbard Gold Medal "for valor in exploration." He was awarded the Congressional Medal of Honor, the D.S.M., Flying Cross, and 22 citations from the Navy Department. He is an officer of the Legion of Honor. In 1927-28 he organized an Antarctic exploring expedition which sailed in three vessels in the summer and autumn of 1928 and established a base in the Bay of Whales, after crossing Ross Sea. The expedition had a more complete equipment than any previous group of polar explorers and it was expected that important contributions would be made to the knowledge of the geology, biology, topography, and meteorology of the Antarctic Continent. By means of the radio, Commander Byrd and his associates kept constantly in contact with the United States. He is the author of *Skyward*, an autobiography (1928). See also *Struggle*, a biography of Commander Byrd, by Charles J. V. Murphy (1928).

**BYRNE, CHRISTOPHER EDWARD** (1867- ). A Roman Catholic bishop, born at Byrnesville, Mo., and educated at St. Mary's College (Kan.) and St. Mary's Seminary (Baltimore, Md.). From 1891 to 1918, he was pastor of churches in Columbia, Edina, and Saint Louis, Mo. In 1918 he was made bishop of Galveston, Tex.

**BYRNE, DONN** (BRIAN OSWALD DONN BYRNE) (1889-1928). An American author, born in New York City, and educated at the University College, Dublin, and in Paris and Leipzig. On his return to New York, he was connected with the *New York Sun* and the *Brooklyn Daily Eagle*. His books and magazine contributions contained a haunting and elusive beauty. *Stories Without Women*, published in 1915, was followed by *The Stranger's Banquet* (1919); *The Foolish Matron* (1920); *The Woman God Changed* (1921); *Messer Marco Polo* (1921); *The Wind Bloweth* (1922); *The Changing*, a collection of short stories (1923); *Blind Raftery* (1924); *O'Malley of Shanganagh* (1925); *Hangman's House* (1926); *Brother Saul* (1927). A book of nine tales, entitled *Destiny Bay*, was published shortly after his death and in 1929 appeared his last novel, *The Field of Honor*.

# C

**CABELL, JAMES BRANCH** (1879- ). An American author, born at Richmond, Va., and educated at William and Mary College. For a year, he was instructor in French and Greek in William and Mary College, and thereafter, until 1901, was occupied as a journalist in Richmond and New York. His works include *The Soul of Melicent* (afterward published under the title *Domnei*, 1913); *The Rivet in Grandfather's Neck* (1915); *The Certain Hour* (1916); *The Cream of the Jest* (1917); *Jurgen* (1919); *The Judging of Jurgen* (1920); *Figures of Earth* (1921); *Joseph Hergesheimer* (1921); *The Jewel Merchants* (1921); *The Lineage of Lichfield* (1922); *The High Place* (1923); *Straws and Prayer-Books* (1924); *The Silver Stallion* (1926); *The Music from Behind the Moon* (1926); *Something about Eve* (1927); *Ballads from the Hidden Way* (1928); and *The White Robe* (1928).

**CABOT, RICHARD CLARKE** (1868- ). An American physician born at Brookline, Mass., (see VOL. IV). He became a full professor of medicine at Harvard University in 1919 and in 1920, professor of social ethics. From 1912 to 1921, he was chief of the medical staff of the Massachusetts General Hospital. He served in France (1917-19) as major and later lieutenant colonel of the U. S. Army Medical Reserve Corps. His book *Physical Diagnosis* went through nine editions from 1901 to 1927. His later works are *Laymen's Handbook of Medicine* (1916); *Rewards and Training of a Physician* (1917); *Social Work* (1919); *Facts on the Heart* (1926); and *Adventures on the Borderlands of Ethics* (1926). In his medical works, several of which went through numerous editions, he originated a new feature in medical teaching. The subject matter consisted wholly of case histories presented in a novel fashion.

**CADMAN, CHARLES WAKEFIELD** (1881- ). An American composer, born at Johnstown, Pa. He received his entire musical education from private teachers in Pittsburgh, where he lived until 1909 as organist of various churches, conductor of a male chorus, and critic of the *Pittsburg Dispatch*. Having become interested in the music of the American Indians, he spent some time at the reservation of the Omaha Indians, making phonographic records of their songs and pieces for flute. Together with Princess Tsianina Redfeather, a full-blooded Indian mezzo-soprano, he lectured on Indian lore, making extensive tours of the United States and also visiting Paris and London. Of his operas, *Shanewis* or *The Robin Woman* was produced at the Metropolitan Opera House (Mar. 23, 1918); *The Garden of Mystery* (New York, 1925); *The Witch of Salem* (Chicago, 1926); *The Sunset Trail* (Rochester, 1927). *The Red Rivals* or *Daoma* (three acts) has not yet been produced although completed in 1919. His other works consist of a piano trio in D, a piano

sonata in A, a Japanese song cycle, several Indian song cycles and two operettas.

**CADMAN, S(AMUEL) PARKES** (1864- ). An American clergyman, born at Wellington, England, and educated at the University of London. From 1896 to 1901, he was pastor of the Metropolitan Temple (Methodist Episcopal), New York City, and after that time pastor of the Central Congregational Church at Brooklyn, N. Y. He was a popular lecturer, his Sunday afternoon talks being broadcast by radio. He was president of the Federal Council of the Churches of Christ in America (1924-28) and at the expiration of this term was elected the first radio minister of the Federal Council of Churches. His works include: *Charles Darwin and Other English Thinkers* (1911); *The Victory of Christmas*; *The Religious Uses of Memory* (1912); *The Life of William Owen* (1912); *The Three Religious Leaders of Oxford* (1916); *Ambassadors of God* (1920); *Christianity and the State* (1925); and *Pro Christi* (1928).

**CADORNA, kà-dòr'nà, COUNT LUIGI** (1850-1928). An Italian general who was born at Pallanza, entered the army in 1868, became chief of the general staff in 1911, and was commander-in-chief of the Italian Army from 1915 to December, 1917. After the defeat at Caporetto, he was transferred to the Military Council at Versailles, and later, as a result of the findings of the Caporetto inquiry commission, was retired from the army. In 1924 he was made a Marshal by Mussolini. He wrote *La guerra alla fronte italiana* (2 vols., 1921).

**CAILLAUX, k'à'yò, JOSEPH** (1863- ). A French public official (see VOL. IV). Six days after the release of Mme. Caillaux, who had been tried for and acquitted of the shooting of M. Gaston Calmette, the World War began. In 1916, Caillaux went to Rome and because of remarks made by him to Italian statesmen that France could not continue the War after the spring of 1917 and that first peace, then an alliance with Germany should be concluded, Briand gave permission to the Italian government to confiscate his papers. The taking of these papers proved most embarrassing to Caillaux, one being the elaboration of a project to overthrow the legal government and have himself made dictator, and the other containing the names of politicians, newspaper managers, etc., whom it would be necessary to arrest or exile. At the close of 1917, the Chambre voted to suspend his parliamentary immunity, and on Jan. 14, 1918, he was arrested. After a trial that dragged on for two years, he was sentenced by the Senate, sitting as a judicial body, to the imprisonment that he had already served, five years prohibition of residence in French territory, and the deprivation of civil rights for ten years, but was granted an amnesty by the Parliament elected in May, 1924, and in November of that year returned to Paris. Elected to the Senate, he was again Finance Minister, in the cabinets of Poincaré and Briand, from April to October, 1925, and from

June to July, 1926, when the franc was at its lowest ebb. His writings include *L'impôt sur le revenu* (1910 and 1914), *Mes Prisons* (1920), and *Où va la France, où va l'Europe?* (1922).

**CAINE, SIR HALL** (1853- ). A British novelist and dramatist (see VOL. IV). During the World War, he wrote British propaganda in the United States. He was knighted in 1918 and made a Companion of Honour in 1922. Many of his novels were dramatized and filmed, both in the United States and in England, and a collected edition of his works was issued in 1921. His later books included *Scenes in the Great War* (1915); *Britain's Daughters* (1916); *The Iron Hand*, a play (1916); *The Minister*, a play (1918); *The Woman of Knockaloe* (1923); and *The Master of Man* (1923). He edited *King Albert's Book* (1914-15), for which he was made an Officer of the Order of Leopold.

**CALCIUM.** See CHEMISTRY.

**CALDER, ALEXANDER** STIRLING (1870- ). An American sculptor (see VOL. IV). He became a member of the National Academy of Design in 1913. The Grand Prize of the Alaska-Yukon Exposition was awarded to him, and also the Designer's Medal of the San Francisco Exposition (1915).

**CALDER, JAMES ALEXANDER** (1868- ). Canadian public official (see VOL. IV). After 1914 he was Minister of Railways and Highways, first vice president of the Canadian Chamber of Commerce of London, and a member of the Imperial War Conference (1918). Since 1921 he has been a Liberal-Unionist Member of the Senate.

**CALDWELL, BURNS DUBBIN** (1858-1922). An American railway official, born in Placerville, Calif. He was educated in the public schools of Chambersburg, Pa., and began his railway service in 1875 with the Vandavia Line. From 1886 to 1892, he was employed in important capacities with several Western railroads, from 1889 to 1902 was traffic manager of the D. L. & W. Railroad, from 1902 to 1911, vice president of that road, and from 1911 to 1922 was president of Wells Fargo & Co. He was chairman of the board of the American Railway Express Company (1918-22).

**CALENDAR.** See ASTRONOMY.

**CALIFORNIA.** The second State in size (158,297 square miles) and the eighth in population; capital, Sacramento. The population of the State increased during the decade 1910-20, from 2,377,649 to 3,426,861, a gain of 44.1 per cent; estimated population, 1928, 4,556,000. The white population increased from 2,259,672 (1910) to 3,264,711 (1920); the Negro, from 21,645 to 38,763; the Indian, from 16,371 to 17,300. The Chinese decreased in number from 36,248 to 28,812, but the Japanese increased in number from 41,356 to 71,952. The native white population increased from 1,742,422 to 2,583,049, while the number of foreign-born whites increased from 517,250 to 681,662. The urban population in 1910 was 1,469,739; in 1920, 2,331,729; the rural population showed an increase of from 907,810 to 1,095,132. The populations of the chief cities increased as follows: San Francisco (q.v.) from 416,912 to 506,676; Oakland (q.v.), from 150,174 to 216,261; San Diego, from 39,578 to 74,883. During the decade, Los Angeles (q.v.) passed San Francisco as the largest city in the State, with a population of 319,198 in 1910 and 576,873 in 1920. Local estimates for Jan. 1, 1929, placed the population of Los Angeles at over 1,400,000.

**Agriculture.** While the population in the State increased 44.1 per cent in the period 1910-20, the number of farms increased by 33.4 per cent, or from 88,197 in 1910 to 117,670 in 1920, and rose further to 136,409 in 1925, owing partly to the cutting up of tracts. In 1925 the acreage was 27,517,000, a decrease from 1920, when it was 29,365,667, and a slight decrease from 1910 as well. Improved land in farms increased from 11,389,894 acres in 1910 to 11,878,339 in 1920. The total value of farm property in the State apparently increased from \$1,614,604,584 (1910) to \$3,431,021,861 (1920) and was \$3,424,785,986 in 1925; the average value of farm property rose from \$18,308 in 1910 to \$29,158 in 1920, and then fell to \$25,107 in 1925. In interpreting these values, however, and, indeed, all comparative values in the period in question, the inflation of values, the nation over, and the ensuing reaction must be taken into account. The total percentage of the land area in farms in California increased from 28 per cent in 1910 to 29.5 per cent in 1920 and diminished to 27.6 in 1925. The percentage of improved farm land decreased slightly from 40.8 per cent (1910) to 40.4 per cent (1920). Of the total of 136,409 farmers in 1925, the number operating as owners was 109,654, as compared with 117,670 in 1920; as managers, 6709, as compared with 4949; and as tenants, 20,046, as compared with 25,141. There was a continuation of the previous increase of owners, partly offset by a decrease in tenants. The white farmers in 1920 numbered 11,184, as compared with 85,119 in 1910; and the number of Japanese farmers had increased from 1816 to 5152 during that time. The total number of colored farmers, including Negroes, Indians, Japanese, and Chinese, was 6486 in 1920, as compared with 3078 in 1910. The farms free from mortgage numbered 36,042 in 1920, as compared with 39,368 in 1910; while the number of mortgaged farms increased from 26,749 in 1910 to 44,109 in 1920, and to 50,801 in 1925. Of the 117,670 farms in the State in 1920, 67,391 were irrigated, or a total irrigated area devoted to agriculture of 4,219,040 acres. Of all farms in 1920, 57.3 per cent was irrigated, as compared with 44.6 per cent in 1910.

The number of cattle in 1925 was 1,918,489; and in 1920, 2,008,037. The number of sheep increased from 2,400,151 in 1920 to 3,045,095 in 1925. Poultry raising developed appreciably, the number of chickens being nearly 12,784,512 in 1925. The production of small fruits in 1919 was 15,458,726 quarts, compared with 26,824,120 quarts in 1909; oranges, 21,628,444 boxes, compared with 14,436,180 in 1909; lemons, 6,551,657 boxes, compared with 2,756,221; and grapefruit, 465,085 boxes, compared with 122,515. The coming of prohibition, which it was anticipated would paralyze the wine-grape industry and depreciate the value of lands used for the purpose, had quite the opposite effect. The vine-growing area more than doubled, and until new vineyards in excess of demand came into bearing, prices for the crop far in excess of those that previously prevailed were secured. The estimated production of the chief crops in 1927 was as follows: Corn, 2,464,000 bushels; wheat, 13,642,000; barley, 25,422,000; rice, 8,960,000; potatoes, 7,956,000; sweet potatoes, 1,080,000; hay, 5,332,000 tons; and cotton, 94,000 bales. Comparative figures for 1913 are corn, 1,815,000 bushels; wheat, 4,200,000;



barley, 33,150,000; rice, 293,000; potatoes, 8,092,000; hay, 3,600,000 tons; and cotton, 23,000 bales.

**Mining.** California is one of the most important of the mineral-producing States and in the value of its products in 1926 ranked third, being surpassed only by Pennsylvania and Oklahoma in that year. The most important of its mineral products are petroleum, natural-gas gasoline, natural gas, and cement. The development of the petroleum fields of the State has been one of the most important events in the history of mineral production in the country, the extent of this development being shown by a comparison of figures for several of the years in the period starting with 1914. In that year, the production was 99,775,327 barrels, valued at \$48,006,096; in 1916, 90,951,936 barrels, \$53,702,733; in 1918, 97,531,997 barrels, \$118,770,790; in 1920, 103,377,000 barrels, \$178,395,000; in 1926, 224,673,000 barrels, \$345,547,000; in 1927, 230,752,000 barrels, \$280,000,000 (estimated). On the other hand, the production of gold in the State has decreased, with but occasional exceptions, from year to year since 1914. The production in 1914 was 999,113 fine ounces, valued at \$20,653,496; in 1916, 1,035,745 fine ounces, \$21,410,741; in 1918, 790,588 fine ounces; in 1920, 692,297 fine ounces; in 1922, 709,677 fine ounces; in 1926, 581,700 fine ounces; in 1928, 521,730.59 fine ounces. This decrease was due partly to the exhaustion of a number of the deep mines and to general depression in the gold-mining industry in the last few years. The cement industry has shown a comparatively steady increase for many years. There were produced in 1914, 5,075,114 barrels; in 1920, 7,098,084; in 1921, 7,302,784; in 1926, 13,842,483; and in 1927, 14,580,654. The output of natural gas increased from 17,823,928 M. cubic feet in 1914 to 204,915,000 M. cubic feet in 1926. In 1920, the production was 60,041,000 M. cubic feet, and in 1921, 75,942,000 M. cubic feet. There was produced also a considerable amount of copper, varying from 30,507,692 pounds in 1914 to 48,153,139 in 1917; 12,626,272 in 1920; 49,433,716 in 1924; 30,442,961 in 1926; 25,150,743 in 1928. The silver production is still important. In 1914 it was 1,471,659 fine ounces; in 1916, 2,564,354; in 1919, 1,107,189; in 1920, 1,706,327; in 1921, 3,629,223; in 1926, 1,077,956; in 1928, 1,478,771. The State has produced large quantities of lead and zinc. The lead production has varied from 4,251,923 pounds in 1914 to 21,808,028 in 1917; 13,372,049 in 1918; 4,813,510 in 1920; 1,124,276 in 1921, and 1,801,037 in 1928. The zinc production in 1914 was 389,471 pounds, which increased in 1916 to 15,256,485 pounds, fell again in 1919 to 472,990 pounds, then rose in 1921 to 1,057,731 pounds, and was 8,062,625 in 1927. In addition to the minerals mentioned above, California produces asphalt, clay, slate, stone, and many other products of great value. The total value of the mineral production of the State in 1914 was \$101,013,199; in 1918, \$204,673,547; in 1925, \$496,923,376; and in 1926, \$523,352,257.

**Manufactures.** California is an increasingly important industrial State. The number of manufacturing establishments has fluctuated, being 7659 in 1909 to 11,942 in 1919, and 10,066 in 1927, while the number of persons engaged in manufactories as wage earners was 139,481 in 1914, 243,962 in 1919, and 262,936 in 1927. The capital invested in 1909 was \$537,134,359; in 1914, \$736,105,445, and in 1919, \$1,233,480,-

273. The most important industries are petroleum refining, canning, and preserving, California ranking first among the States in the canning of fruits and vegetables. The value of these products in 1909 was \$32,915,000; in 1919, \$219,279,000; in 1925, \$199,156,316. The value of the products of the petroleum-refining industry, which in 1925 ranked first in importance, was \$17,878,000 in 1909; \$213,292,000 in 1919; and \$369,581,955 in 1925. Shipbuilding and boatbuilding, ranking third in the value of its product, had an output in 1909 valued at \$4,132,000; in 1914, \$8,104,000, and in 1919, \$185,882,000; the extraordinary growth from 1914 to 1919 being the result of great shipbuilding operations carried on because of the War. Slaughtering and meat packing also form an important industry. The value of the product in 1909 was \$34,280,000; in 1914, \$50,612,000, and in 1919, \$94,450,000. The increase in the value of products from 1914 to 1919 was in great measure due to the changes in the industrial conditions brought about by the War; a more definite evidence of progress is shown by a comparison of the number of wage earners and of the horse power used, both of which indicate unmistakably a growth in the manufactures of the State.

The chief manufacturing cities are San Francisco, Los Angeles, and Oakland. In San Francisco, the number of manufacturing establishments, with the value of their products, was: in 1909, 1796 and \$133,041,000; in 1919, 2360 and \$417,321,000; in 1925 products attained the value of \$531,827,000. The manufacturing establishments of Oakland interests increased from 441 in 1909 to 573 in 1914 and 593 in 1919, the value of products was \$22,343,000 (1909); \$134,755,000 (1919); and \$144,841,000 (1925).

**Education.** California has always been among the foremost States in its educational advancement. In 1913, the ex-officio Board of Education was abolished, and was superseded by the State Department of Education, which, however, was handicapped by the fact that it was in a measure double-headed and divided authority between the Superintendent of Public Instruction and the Governor. In 1921 a special legislative committee on education studied the school system of the State with the object of suggesting improvement in the laws to render the educational administration more efficient; and the Legislature of that year passed a law which carried into effect many of the recommendations made by the commission, although it could not alter the administrative form of the educational system, such a change involving a constitutional amendment. The Legislature of 1923 further amended the law of 1921. Studies for the elimination of useless matter from the elementary school curriculum led to reforms therein in 1925. The total enrollment in the schools of the State in 1914, including kindergarten, elementary, high, and normal schools, was 501,921. The enrollment in the kindergartens and elementary schools in the academic year 1925-26 was 769,676; in the high schools, 256,797. In 1922 the enrollment in kindergartens was 20,061; in the elementary schools, 571,878, and in the high schools, including junior colleges and special schools, 227,270. The total expenditures for elementary and high schools, 1925-26, were: current, \$95,825,128; outlays, \$41,163,268. California's percentage of illiteracy is among the lowest of the States. It decreased from 4.3 per

cent in 1910 to 3.9 per cent in 1920; the decrease among native whites being from 0.6 to 0.4 per cent; among the Negroes, from 8.4 to 5.6 per cent.

**Finance.** State expenditures in the year ended June 30, 1928, as reported by the U. S. Department of Commerce, were: for maintenance and operation of governmental departments, \$64,404,531 (of which \$24,109,162 was for local education); for public service enterprises, \$2,558,923; for interest on debt, \$4,351,646; for permanent improvements, \$17,216,047; total, \$89,031,147 (of which \$15,796,198 was for highways, \$4,976,297 being for maintenance and \$10,819,901 for construction). Revenues were \$101,729,699; property and special taxes furnished 19.3 per cent thereof; departmental earnings and remuneration for State services, 6.5 per cent; license sales and gasoline taxation, 60 per cent. No general property tax was levied, other revenue more than covering expenditures. Net State funded debt on June 30, 1927, was \$115,614,807. Of outstanding bonds, \$64,725,000 were highway debt.

**Political and Other Events.** Hiram W. Johnson, Governor in 1914, subsequently held a commanding position in the State and in national affairs. While James D. Phelan, the Democratic candidate for United States Senator, was elected in 1914, Johnson, on a Progressive ticket, was reelected Governor. At this election, a proposed prohibition amendment to the constitution was defeated. The Progressives continued to control the State Legislature. A novel departure in legal procedure was the appointment, in 1914, of a public defender in Los Angeles County. On Apr. 30, 1914, there was an eruption of Mt. Lassen, a supposedly extinct volcano in the northern part of the State. In 1916, as a result of area added in the municipal elections, Los Angeles became the largest municipal area in the country. On July 22, 1916, during a preparedness parade in San Francisco, an internal machine was exploded in the crowd, causing the death of six and the injury of 25. On Jan. 28, 1916, a dam at San Diego burst, causing the death of 65 persons and a property loss of \$200,000,000. C. C. Young, Republican, was elected governor in 1926, and Senator Shortridge was reelected, while a referendum proposal to repeal the State Prohibition Act was defeated by a largely sectional vote of the southern counties, San Francisco favoring repeal. Los Angeles experienced difficulties with its water system, first in the Owens Valley in 1927, where sympathizers with local interests deprived of irrigation water dynamited the aqueduct repeatedly, and in 1928 at the dam in San Francisquito Canyon, which broke Mar. 13, 1928, causing the loss of over 400 lives.

California occupied a prominent place in the presidential election in 1916. The Republican Party was divided by factional dispute and as a result the Democratic electors received a plurality of 3373 votes. This result gave the election to President Wilson. For the first time in the history of the State, women voted. Governor Johnson was elected to the United States Senate. William D. Stephens, lieutenant governor, became governor of the State and was reelected in 1918. The Supreme Court in 1918 upheld the constitutionality of the State Primary Election Law. Samuel M. Shortridge was elected Senator, defeating J. D. Phelan, Democrat. At this election, a prohibition amendment and an

act prohibiting vivisection and compulsory vaccination were defeated. For President, in 1920, Harding received 624,992 votes and Cox, 229,191. A referendum on Nov. 2, 1920, ratified the anti-alien land-leasing law passed by the Legislature. The chief object of this act was to prevent Japanese from holding agricultural land in California. Its effect was to render it impossible for 60,000 or 70,000 resident Japanese to lease land in their own right or in behalf of their children. In 1922, Friend W. Richardson, Republican, was elected governor and Senator Johnson was reelected in 1922 and 1928. An investigation into election expenses paid for by corporations was carried on by the State Senate in 1923, and measures were passed to prevent excessive expenditures. On Sept. 17, 1923, a fire in Berkeley caused a property loss of over \$10,000,000. On November 11 of this year, the United States Supreme Court declared valid laws prohibiting alien ownership of land in the State. In the presidential primaries of 1923, President Coolidge was endorsed by the Republicans and William G. McAdoo, by the Democrats. The State's Presidential vote was: Coolidge (Republican), 733,250; LaFollette (Progressive), 424,649; Davis (Democrat), running third, received 105,514. The votes in 1924 ratified eight constitutional amendments, one authorizing taxation of stocks, bonds, mortgages, and other credits at other than the general property rate. For President in 1928, Hoover received 1,162,323 votes; Smith, 614,356.

**Legislation.** The Legislature of 1915 passed a measure abolishing political party distinction from the ballots. This, however, was defeated by referendum later in the year. Attempts to amend the Anti-alien Land Act, passed in 1913, failed. A constitutional amendment of 1917 provided for a compensation law subject to the approval of the people. A "blue sky" law was also enacted and a constitutional amendment providing for social insurance. In 1919 the Legislature appropriated \$1,000,000 for the extension of the State land settlement project including preferential selection of farms by returned service men. A \$40,000,000 highway bond issue was submitted to the people and adopted on July 1. A constitutional amendment providing for a constitutional convention was voted on in November, 1920, and passed. This legislature passed also a compulsory education law and created a department of agriculture. In 1921 the Legislature passed several measures to aid soldiers; reorganized numerous State boards and offices into six administrative departments under the governor; created a small-claims court and county public defenders, and enacted a State prohibition enforcement act. In 1923 the Legislature made instruction in the Constitution of the United States compulsory in all schools, amended the Workmen's-Compensation Law, and passed an absent voters act. The State Civil Service Commission was replaced in 1925 by a single commissioner; courts were authorized to appoint experts in criminal trials; and criminal action to maintain canned-fruit standards was authorized. The Governor's Council of Nine, comprising the chief department heads, was created in 1927, to centralize activities of the various State commissions. The Reapportionment Act of 1927 provided one State Senator to each county.

**CALIFORNIA, UNIVERSITY OF.** A non-sectarian, coeducational State institution at

Berkeley, Calif., founded in 1868, having branches at Los Angeles, Davis, Riverside, Mount Hamilton, La Jolla, Mountain View, Cortena, and in the Imperial Valley. The enrollment of full-time students increased from 7526 in 1914 to 16,959 in the autumn of 1928, plus an enrollment of 35,467 in extension classes, 6,692 in correspondence schools, and 10,288 in the summer session of 1928. The faculty increased from 434 to approximately 1500 members on the regular teaching staff and 700 on the extension staffs; the library from 200,000 volumes to about 1,000,000. The productive funds grew from \$5,540,263 in 1914 to \$13,280,313 in 1927-28, and the income for the latter year was \$532,251. Five buildings were completed in 1917 from a \$2,000,000 State-bond issue: Wheeler Hall, a classroom named for the president of the University; a new wing for the library; Hilgard Hall, an agriculture building; a wing for the chemical laboratory; and a unit for the power plant. In 1923 Le Conte Hall for the department of physics; Hesse Hall, the first unit of a group of buildings for the engineering departments, and the California Memorial Stadium, costing \$1,350,000, were completed; while Haviland Hall, for the school of education, was in course of construction. Later additions to the plant included four buildings on the new campus at Los Angeles in 1928, in addition to which it was planned to have a fifth ready for occupancy when the institution was moved in the summer of 1929. On the Berkeley campus, Bowles Hall, a dormitory for men, and the first dormitory at the University of California, was completed in 1928, and work was started on a life sciences building, to be the largest used for academic purposes in the United States. The International House, to cost \$1,750,000, a fine-arts group and auditorium, and an engineering building, were planned for the year 1929, and a number of changes were effected on the campus in the way of improvements and additional acreage. David Prescott Barrows, Ph.D., succeeded Benjamin Ide Wheeler as president in 1919, and was succeeded in turn in 1923 by William Wallace Campbell, Sc.D., LL.D. In 1929 Robert Gordon Sproul was elected president, Dr. Campbell having presented his resignation to take effect July 31, 1930.

**CALIFORNIA INSTITUTE OF TECHNOLOGY.** An institution of collegiate and graduate instruction and research in the pure and applied sciences, at Pasadena, Calif., founded as Throop Polytechnic Institute in 1891. The present campus was acquired in 1910 and at that time was adopted the present policy of development of an institution of university grade devoted to undergraduate and advanced instruction in the fundamental sciences and in the various branches of engineering, and to research in these fields. Since the World War, the progress of the institute has been rapid. In 1917 the Gates Chemical Laboratory was erected and equipped, and an extension was completed in 1926. In 1923 the Norman Bridge Laboratory of Physics was opened. In 1922 Culbertson Hall, an auditorium seating 500 persons, was erected and in 1924 the High-Potential Research Laboratory was built and equipped through the cooperation of the Southern California Edison Company. A laboratory of steam engineering, an engineering research laboratory, and a seismological laboratory were erected in 1927. A building for the Daniel Guggenheim Graduate

School of Aeronautics was completed in 1928, also a Hall of Humanities provided for by gift from Mr. and Mrs. Joseph B. Dabney, and the first large unit of the William G. Kerckhoff Laboratories of Biology. Monetary gifts have included nearly \$3,000,000 from the General Education Board; \$40,000 from the Carnegie Foundation for the Advancement of Teaching; \$30,000 a year for a period of years from the Carnegie Institution of Washington for the support of researches in the structure of matter and the nature of radiation; and \$12,000 for researches in genetics; \$185,000 from the Carnegie Corporation of New York; \$350,000 from the Daniel Guggenheim Fund for the Promotion of Aeronautics, part of which was used for the building mentioned above; and \$20,000 a year from the Rockefeller Foundation, through the National Research Council, to National Research Fellows conducting work at the Institute. Student enrollment in the fall of 1928 was 639 and there were 200 members of the staff of instruction and research, including teaching fellows and assistants. Productive funds in the fall of 1928 amounted to approximately \$9,000,000 and annual income to approximately \$500,000. The International Education Board provided for the construction by the Institute of the Astrophysical Observatory, equipped with a 200-inch reflecting telescope and many auxiliary instruments. A prime purpose of the gift was to secure for the observatory the advantage in its design, construction, and operation, of the combined knowledge and experience of the group of investigators in the research laboratories of the institute and in the neighboring Mount Wilson Observatory of the Carnegie Institution of Washington. The institute has no president, the administration centering in an Executive Council of eight, of which Robert A. Millikan, Ph.D., LL.D., Sc.D., Nobel Laureate, is chairman. Other members are Arthur H. Fleming, Allan C. Balch, George E. Hale, Thomas H. Morgan, William Bennet Munro, Arthur A. Noyes, and Henry M. Robinson.

**CALIPHATE.** The Caliphate or leadership of the Mohammedan world, which had been held by rulers of Turkey since the sixteenth century, was allowed to lapse on Mar. 3, 1924, when the Turkish Grand National Assembly at Angora deposed Abdul Mejid from the office of Caliph and abolished the institution, at least temporarily, in so far as Turkey was concerned. The Caliphate immediately became the subject of international intrigue and universal discussion. The spiritual and temporal powers which the Turkish Sultans had enjoyed as Caliphs have often been exaggerated, even to the point of erroneously comparing the Caliphate to the Papacy. In theory, to be sure, the Caliph was the representative or vicegerent of the prophet Mohammed, guardian of the sacred law of Islam, defender of the faith, and spokesman of some 300,000,000 Mohammedans. As a matter of fact, although for a while after Mohammed's death, A.D. 632, the Caliphs enjoyed great prestige, the office was not recognized by the large body of schismatic Shahs in Persia and elsewhere, nor did it in modern times command much more than nominal respect among non-Turkish Mohammedan populations. It was a mere shadow when it was taken by Sultan Selim I from the last of the Abbasids, in the sixteenth century, to become hereditary in the house of Othman. Abdul Hamid II. used it as a convenient in-

strument to strengthen his political pretensions and to enlist support from Mohammedans outside his empire, and the dramatic German Emperor William II generously but inaccurately referred to the Sultan "whom 300,000,000 Mohammedans throughout the world revere as the Caliph"; but after the revolution of 1903 and the rise of the Young Turks, the artificially inflated prestige of the Caliphate was punctured by a series of inglorious wars and by Arab revolts against the Pan-Turanian policies of the Young Turk leaders. The Young Turks, indeed, were willing to use the Caliphate for their own nationalistic ends, but placed little confidence in its dubious vitality.

The outbreak of the World War made the use of sentiment once more desirable. To rally the Islamic host to the aid of Turkey, the Sultan, Mohammed V, in 1915 was induced to become once again the head of a militant Caliphate and to proclaim the dreaded Jihad, or Holy War. The Holy War failed outside of Turkey, for Arab, Berber, and Indian Mohammedans fought in the Allies' cause; it became increasingly evident to the West that the Caliph's position, heretofore magnified by the Powers in the interests of their own policies, was really sadly insecure. For Mustapha Kemal and the Nationalist Turks, after the War, the institution of the Caliphate possessed no attraction. It is difficult to say whether, in their admiration for Western institutions, the Nationalists did not lean too far over to the left, and in pretending a lack of sympathy for religious ideas, tend to minimize the hold that Mohammedanism still had on the great masses of the Turkish population. At any rate, action was drastic. After the Mudania Convention had given Constantinople into their hands, the Nationalists, on Nov. 2, 1922, deposed the Sultan-Caliph, Mohammed VI, and abolished the Sultanate. They named Abdul Mejid Caliph, but they sheared the office of all its temporal power. Islam was made to realize that Turkey merely waited for a propitious moment to rid herself of the Caliphate altogether. The too eager interest of Indian Mohammedans furnished the opportunity. After the War, Indian extremists worked heroically for the resurgence of the Caliphate's high dignity, not in the interest of Turkey but rather in that of an independent India. The appeal was frankly religious and sentimental; around Nationalist Turkey, which had successfully defied Great Britain, crystallized a myth of the new Mohammedan leader who was to guide the Islamic world back to its former greatness. The Nationalists regarded such talk with suspicion. To them, in an agitation of this kind, the way seemed easily left open for foreign interference in Turkish affairs. When the well-intentioned Indian Mohammedans, the Aga Khan and Ameer Ali, in a letter to Ismet Pasha, the Turkish Premier, on Nov. 24, 1923, urged on the Angora government the necessity for upholding the power of the Caliphate, summary action was decided on. The so-called tribunal of independence was appointed to try the Constantinople editors whose papers were alleged to have published the letter before Ismet Pasha had even received it. And then, in the debate on the budget in the Assembly, on Mar. 1, 1924, Mustapha Kemal demanded the abolition of the Caliphate. Two days later, the Assembly complied, and on the next day Abdul Mejid and his son were bundled across the European fron-

tier. To indicate how completely secular and religious affairs were henceforth to be sundered, drastic measures were enacted providing for the seizure of effects and estates belonging to the deposed Othman family, the confiscation of all the property of the Pious Foundations, the subordination to the civil authorities of the law administration based on the Koran, and the abolition of religious schools. Turkey thus parted with her past and frankly accepted Occidental standards. Whether the loss of the prestige which the Caliphate had formerly conferred on her would militate against Turkey's influence remained to be seen.

The abolition of the Caliphate brought consternation to many sections of the Moslem world, and stirring protests were made against the action of the Turkish government. Shortly after the deposition of Abdul Mejid, King Hussein of the Hedjaz laid claim to the title by virtue of his direct descent from the Prophet and his control of the two holy cities, Mecca and Medina. He was proclaimed Caliph in Transjordan in March, but, outside of Palestine, Syria, and parts of Arabia, his claim received little attention. It disappeared entirely when his kingdom was conquered by Ibn Saud. Among Moslems, the Caliphate situation brought forth every shade of opinion, ranging from the contention that the position was without significance to the assertions of those who held that the Sultanate of Turkey and the Caliphate were indivisible.

Among the more authoritative voices was that of the Egyptian Moslems, who held that the Caliphate was vacant and should be filled by election by representatives from all Islam. They proposed to call a Caliphate conference in Cairo in March, 1925, but later postponed the meeting for a year. The conference, held in May, 1926, was only partially representative and took no decisive steps.

In the meantime, Ibn Saud had completed his conquest of Hedjaz and was in control of the Holy Cities. He made every effort to cultivate the good will of all Moslems, particularly by providing conveniences and lowering costs to the throngs of pilgrims visiting these cities, and it was presumed that he was paving the way for his own selection as Caliph. In 1926 he called a great Moslem Congress to meet in Mecca in June and July. It was attended by delegations from all lands professing the Sunni Mohammedan faith, and it gave much attention to such matters as the health and comfort of pilgrims and the care of the holy places. But the subject of the Caliphate was considered only in an informal way and no action upon it was taken. Following this Congress, the situation with respect to the spiritual headship of Islam remained nebulous, reflecting the great diversity of views as to its importance and the proper manner of filling the place.

**CALKINS, RANSOM M.** (1863- ). An American railway official, born at Ogdensburg, N. Y. He was educated in the public schools of that city and began his railway service with the Chicago, Milwaukee & St. Paul Railroad in 1879. He rose through various grades with that road and in the years following served with many important railways in the West, chiefly as traffic manager. He served in this capacity with the Chicago, Milwaukee & St. Paul Railway from 1913 to 1917 and was made president of that road in 1918. In 1920, he became vice

president and after 1926 was assistant to the receiver during the receivership and reorganization.

**CALLAN, JOHN GURNEY** (1875- ). An American mechanical engineer, born at Northfield, Conn. He graduated from the Massachusetts Institute of Technology in 1896 and for several years was with the General Electric Company and with the Arthur D. Little Company of Boston. He was professor of steam and gas engineering at the University of Wisconsin from 1915 to 1920, when he became professor of industrial management of the Graduate School of Business Administration at Harvard. He took out about 70 patents, chiefly in connection with steam turbines, and was a member of several scientific societies.

**CALLES, kál-yá' PLUTARCO ELIAS** (1877- ). A Mexican President and public official, born in the State of Sonora and at one time Governor of that State. He was a close associate of President Obregon (q.v.) and with the backing of the Labor Party became Secretary of the Interior in Obregon's cabinet. In August, 1923, he resigned to conduct his campaign for nomination to the Presidency, in which he was supported by Obregon, the Labor Party, and several smaller groups. A bitter fight ensued between Calles and Adolfo de la Huerta, nominee of the Coöperative Party, which ended in an unsuccessful attempt at revolution by the latter. Calles was elected in July, 1924, and made a tour of the United States and Europe before assuming office on November 30. His administration was marked at the start by the improvement of finances by drastic economy, and later by the amicable settlement of difficulties with the United States over the enforcement of the land laws, a long and bitter struggle with the Roman Catholic Church, and a number of unsuccessful revolutions. He declined renomination for the Presidency and at the conclusion of his term on Dec. 1, 1928, retired to private life. Upon the outbreak of a serious revolt against the Portes Gil administration on Mar. 2, 1929, he was recalled and appointed Secretary of War, assuming command in the field of the main government armies which finally crushed the revolt in April and May. See MEXICO, *History*.

**CALLOWAY, ALFRED W.** (1872-1926). An American coal operator, born in Manchester, England. He came to the United States in 1882 and was educated in the public schools of Brooklyn, N. Y. He was employed in many important capacities in several railroads and from 1913 to 1926 was president of the Davis Coal & Coke Company, of Baltimore and of the Buffalo & Susquehanna Coal and Coke Co., 1925-26. From 1917 to 1923, he was also president of the Pittsburgh Terminal Coal Company and was director and official in many important coal-mining and other corporations.

**CALMETTE, kál'mét', ALBERT** (1863- ). A French bacteriologist and sanitarian, born at Nice. He received the degree of M.D. from the University of Paris in 1886, spent some years as surgeon in the French Navy, and in 1889 founded and became director of a branch Pasteur Institute in Saigon. Resigning from the navy, he was appointed director of the Pasteur Institute at Lille and remained until the death of Metchnikoff, when he succeeded Roux as assistant director of the Paris institute. Calmette's chief publications are: *Recherches sur l'épuration*

*biologique et chimique des eaux d'égout*, 8 vols. (1905-14); *Recherches expérimentales sur le tuberculose* (1907-14); *Les venins, les animaux vénéreux et la sérothérapie antivénimeuse* (1907; in English translation, 1908); also with Breton, *L'ankylostomiase* (1905); and (with Imbeaux and Poitevin) *Égouts et vidanges, ordures ménagères, cimelières*, 2 vols. (1911). After the World War, he became active in tuberculosis prevention through the immunizing of infants. His *Infection bacillaire et la tuberculose* (1920) received an English translation and in 1927 appeared *La vaccination préventive contre la tuberculose*.

**CALVERT, LOUIS** (1859-1923). An English actor born in Manchester who made his first appearance at the Theatre Royal at Durban, Natal, in 1878. During 1888-89 he toured in America with Mrs. Langtry and in conjunction with Martin Harvey and William Haviland took out the Lyceum Vacation Company. He toured with Miss Fortescue and Ben Greet's company and in 1890 formed his own company and produced Shakespearean plays. From 1915 to 1919, he was in America. He then returned to England, playing in *Daddalums* and in *The Tempest*. In 1922 he was best known as the Baron in *He Who Gets Slapped*. He died July 18, 1923. Among his books were *An Actor's Hamlet and Problems of the Actor* (1919).

**CALVERT, PHILIP POWELL** (1871- ). An American zoölogist born at Philadelphia, Pa., and educated at the University of Pennsylvania (Ph.D., 1885) and at Berlin and Jena. He was assistant instructor in zoölogy at the University of Pennsylvania (1892-97), instructor (1897-1907), assistant professor (1907-12), and professor (1912- ). Professor Calvert traveled extensively in Mexico and Central America, and his scientific publications were mainly studies on the dragon flies of Central America. He was associate editor of the *Entomological News*, 1893-1910, and editor after 1911. He is the author (with Amelia S. Calvert) of *A Year of Costa Rican Natural History* (1917).

**CALVIN, EDGAR EUGENE** (1858- ). An American railway official, born in Indianapolis. He was educated in the public schools of that city and began his railroad career as telegraph operator on the Indianapolis, Cincinnati & Lafayette Railroad in 1875. He entered the service of the Union Pacific Railway in 1882, rising to the office of trainmaster. After serving as general superintendent and general manager of several important railways in the West, he was appointed president of the Union Pacific Railroad in 1916. During the World War, he acted as Federal manager for many important roads and in 1920 became vice president of the Union Pacific System lines.

**CAMBODIA.** See FRENCH INDO-CHINA.

**CAMBON, kám'bôn', JULES MARTIN** (1845- ). A French diplomat (see VOL. IV). Having been French Ambassador in Berlin until the outbreak of the World War, his knowledge of German affairs was very valuable to France. He was General Secretary for Foreign Affairs in 1915. Clémenceau appointed him president of the Ministry in 1917 so that he might advise in the Franco-American negotiations of that year, and in 1918 he was made Councilor for the Affairs of Alsace-Lorraine. He was elected to the French Academy in the same year, and in 1920 was president of the Conference of Ambassadors.



**CAMBON, PIERRE PAUL** (1843-1924). A French diplomat (see VOL. IV), Ambassador to England (1898-1920) and a member of the *Institut* (Académie des Sciences, Morales et Politiques). He was largely influential in frustrating Germany's efforts to separate France and England in 1914, and he also did much during the peace negotiations to keep France and Great Britain on good terms. He resigned as Ambassador to Great Britain in November, 1920, and died at Paris, May 28, 1924.

**CAMBRAT, BATTLE OF.** See WAR IN EUROPE.  
**CAMBRIDGE.** An educational and manufacturing city of Massachusetts. The population rose from 104,839 in 1910 to 109,694 in 1920 and to 125,800 in 1928, by estimate of the Bureau of the Census. In April, 1923, a 14,000,000-gallon water-purification plant of the mechanical or rapid-filter type was opened. It was the first of its kind for general purposes and the only one municipally operated in Massachusetts. The catchment area covered 23.6 square miles and contained two impounding reservoirs, one having a storage capacity of 3,000,000,000 gallons and the other of 400,000,000 gallons. In 1925, 21,945 persons were employed in approximately 350 manufacturing establishments and received \$27,409,000 in wages; the value of products manufactured was \$105,833,000. Cambridge has 111 miles of streets, 174 miles of sewers, 143 miles of water pipes. There are 28 public schools, 10 parochial schools, 6 private schools, and 2 higher institutions of learning, Harvard University and the Massachusetts Institute of Technology. The assessed valuation of property in 1928 was \$183,385,700; the net indebtedness was \$7,202,274.

**CAMDEN.** A city of New Jersey on the Delaware River opposite Philadelphia. Its population rose from 94,538 in 1910 to 110,309 in 1920, and to 135,400 in 1928 by estimate of the Bureau of the Census. The commission form of government was adopted in 1923. Since 1924, as the result of the adoption of a city plan, Camden has undergone a transformation. The outstanding features have been the construction of a \$1,250,000 Community Hotel in 1925, the erection of the city's first skyscraper, the Wilson Building, in 1926, the opening of a large theatre in 1926, and most recently the construction of a second skyscraper, two large bank buildings, and another hotel. The \$2,000,000 Marine Terminal and the \$6,200,000 City Hall and Bus Terminal, in combination with an annex to the County Court House, are also being erected. The suspension bridge between Camden and Philadelphia, which was begun in 1921, was completed in 1926 at a total cost of \$28,871,000. The main span is 1750 feet, with an underclearance of 135 feet and a total length of 1.82 miles. In 1924, \$6,000,000 was expended on new boulevards, and the same year the Philadelphia & Reading Railroad opened a new \$3,000,000 terminal with 14 tracks. Camden is mainly an industrial city and its 350 manufacturing plants in 1925 gave employment to 22,700 persons, receiving wages of \$29,175,000, and turning out products valued at \$164,051,000. The assessed valuation of property in 1928 was \$191,459,525; the net indebtedness was \$10,554,176.

**CAMERON, SIR DAVID YOUNG** (1865- ). A British painter and etcher, born at Glasgow. After attending the Glasgow Academy, he studied

in Edinburgh. Among other honors, his work, which is represented in art galleries in England, Europe, and America, won gold medals at Dresden (1897), at Paris (1900), and at Munich (1905). He was elected to the Royal Scottish Academy in 1918, and to the Royal Academy in 1920. The Honorary LL.D. degree was conferred on him by the universities of Glasgow (1911), Manchester (1923), and Cambridge (1928). He was knighted in 1924. His books include *The Clyde Set* (1890); *North Holland* (1892); *North Italy* (1896); *The London Set* (1900); *Paris Etchings* (1904); *Etchings in Belgium* (1907); illustrations to Sir Herbert Maxwell's *Story of the Twced* (1905), and etchings to illustrate *The Compleat Angler* (1902).

**CAMEROON, kă'me-rōon', BRITISH.** A British mandate territory formerly a part of the German Kamerun on the west coast of Central Africa stretching from the sea along the Nigerian frontier to Lake Chad. Area, 31,000 square miles; population, estimated in 1928, 600,000. While the territory was administered from Nigeria, independent accounts were maintained although the revenues and expenditures are incorporated in the accounts for Nigeria. The leading exports in 1926 were palm products, rubber, ivory, cocoa, and totaled £220,740. Imports totaled £275,430. In 1926, 136 vessels of 265,536 tons entered Victoria. The mark was used until July 1, 1922, and then was replaced by British currency.

**CAMEROON, FRENCH.** A French territory on the west coast of Central Africa, formerly the German Kamerun, held under a mandate of the League of Nations. Area, 166,489 square miles and population in 1926, 1,878,683. By decree of March, 1921, the territory was given autonomy and a seat of government in 1921 was erected at the inland town of Yaoundé (population 30,000). Duala, the chief port, had about 18,000 inhabitants. The Commissioner of the Cameroon sat on the council of the governor of French Equatorial Africa, and thus common action was assured. The budget for 1927 balanced at 41,708,350 francs. A special railway budget included 16,000,000 francs. The leading products are coffee, tobacco, palm oil, and ivory and netted an export value of 155,000,000 francs in 1926. Imports were 192,000,000 francs. In 1925, 217 vessels, four-fifths of them French, entered the port of Duala. The territory had 369 miles of railway in 1927, and 1120 miles of roads. A railway from Duala to Yaoundé was constructed.

**CAMMAERTS, ÉMILE** (1878- ). A Belgian poet born at Brussels, who in 1908, went to England to live, remaining a Belgian subject. Among his French works were translations of John Ruskin and G. K. Chesterton; two plays, *Les Deux Bossus* and *La Veillée de Noël*; and *Poèmes Intimes* (1922). He also wrote: *Les Bellini—An Essay in Art Criticism*; *Belgian Poems* (1915); *New Belgian Poems* (1917); *Through the Iron Bars* (1917); *Messines and Other Poems* (1918); *Belgium, from the Roman Invasion to the Present Day* (1920); *The Childhood of Christ as seen by the Primitive Masters* (1922); *The Treasure House of Belgium* (1924); and *The Poetry of Nonsense* (1925). Cammaerts's poems written during the World War and his *Through the Iron Bars*, which recounts the sufferings of Belgium in that period, won for him a wide popularity.

**CAMOUFLAGE OF VESSELS.** See WORLD WAR.

**CAMP, WALTER** (1859-1925). An American authority on athletics (see VOL. IV). He is author of the following: *Auction Up-to-Date* (1914); *Captain Danny* (1914); *Danny, the Freshman* (1915); *Keeping Fit All the Way* (1919); *Spaulding's Official Football Guide* (1920); *Football Without a Coach* (1920); *Handbook on Health and How to Use It* (1920); *Daily Dozen* (1921); *Training for Sports* (1921); and *How to Play Football* (1922).

**CAMPBELL, kām'b'l, BEATRICE STELLA TANNER** (Mrs. PATRICK) (1867- ). An English actress (see VOL. IV). She married George F. M. Cornwallis-West in 1914. The same year, she came to America and toured in Shaw's *Pygmalion*. The following year, she played the leading rôle in *The Second Mrs. Tanqueray* and Mrs. Blaine in *Searchlights*. She returned to London and among her best rôles was Lady Macbeth (1920), played to James K. Hackett's *Macbeth*. She has published *My Life and Some Letters* (1922).

**CAMPBELL, EDWARD DE MILLE** (1863-1925). An American chemist (see VOL. IV). In 1917 he was consulting chemist of the United States Ordnance Department at large. He wrote many articles on chemical and allied subjects, and was a member of many scientific societies.

**CAMPBELL, HENRY DONALD** (1862- ). An American geologist, born at Lexington, Va. He attended Washington and Lee University where he received the degrees of A.M. in 1882 and Ph.D., in 1885, and also studied in 1886-87 at Berlin and in 1887-88 at Heidelberg. In 1882, he was made an instructor in chemistry and geology at Washington and Lee and in 1888 attained the chair of geology and biology. After 1920 he devoted his attention to geology. Dr. Campbell served as dean of the academic faculty during 1906-08 and in 1908 became dean of Washington and Lee University. During January-June, 1912, he was acting president of the institution. He is an authority on the geology of West Virginia and on the Mesozoic diabases of the Atlantic border.

**CAMPBELL, OSCAR JAMES, JR.** (1879- ). An American educator, born at Cleveland, Ohio. He was professor of English at the University of Wisconsin from 1911 to 1921, and in 1921 became professor of English at the University of Michigan. In 1918, the United States government commissioned him to collect information about Turkey to be used at the Peace Conference. His writings include: *The Comedies of Holberg* (1914); *A Book of Narratives*, with R. A. Rice (1917); *The Position of the Roode en Witte Roos in the Saga of Richard III* (1919), and *Great Nineteenth-Century English Poets* (1928).

**CAMPBELL, Mrs. PATRICK.** See **CAMPBELL, BEATRICE STELLA TANNER**.

**CAMPBELL, WILLIAM** (1876- ). An American metallurgist, born at Newcastle on Tyne, England. He was graduated at the Durham College of Science in 1898, where he also received degrees in 1903 and in 1905. After a year at the Royal School of Mines in London as Research Scholar, he came to New York and studied at Columbia, receiving his Ph.D. in 1903. He lectured on geology and metallurgy at Durham, England, and in 1903, became a lecturer on geology at Columbia where in 1914 he became full professor of metallurgy. During 1907-11, he was metallographer to the United States Geological Survey and to the Bureau of

Mines (1911-21). He has given special attention to the micro-structure and physical properties of metals and alloys and has studied the influence of heat and the mechanical treatment on the structure and properties of iron and steel and other alloys. During the World War, he served with the National Research Council on his specialties.

**CAMPBELL, WILLIAM WALLACE** (1862- ) An American astronomer and university president (see VOL. IV). He was president of the American Association for the Advancement of Science in 1915 and of the American Astronomical Society in 1922-25. As director of the Lick Observatory, he was in charge of eclipse expeditions to Western Australia in September, 1922, and to Lower California in September, 1923. He has been president of the University of California since July, 1923 (his retirement in July, 1930, was announced in June, 1929). He was the Halley Lecturer at Oxford in 1925, and was made an officer of the French Legion of Honor in 1927.

**CAMPENDONK, kämp'-en-dönk, HEINRICH M. E.** (1889- ). A German artist who was born in Kurfeld, studied textile and other industrial art at the Technical High School, and became professor at the Art Academy of Düsseldorf. He has exhibited paintings and decorative works at Munich, Dresden, Berlin, Darmstadt, and the Section d'Or in Paris, and is a contributor to art magazines and other publications.

**CAMP FIRE GIRLS.** An organization for girls founded in 1912 in connection with schools and churches, for the purpose of promoting good health and better citizenship by providing a programme of wholesome and pleasant outdoor activities, and service. By 1929 there were Camp Fire organizations throughout the United States, and in twenty-three other countries. The membership in 1916 was 35,980, while in 1928, 132,982 members and guardians were enrolled, and the junior organization, the Blue Birds, numbered 17,284. During 1928 approximately 43 per cent of the members went camping. In the same year, 2,847 persons attended the 103 leaders' training courses. Each year the Camp Fire Girls undertake some particular project, as in 1928 they specialized in home and hand crafts, and citizenship, while in 1929 the project adopted was home gardening and house plants, and the presentation of flowers to the sick.

**CANADA.** A British dominion in the northern half of the North American continent, bounded on the west by the Pacific Ocean and Alaska; on the south by the United States; on the east by the Atlantic Ocean, the Gulf of St. Lawrence, and Davis Strait; and on the north by the Arctic Ocean. The total area of Canada is 3,729,665 square miles, consisting of 3,603,336 square miles of land and 126,329 square miles of water. The Sixth Census of the Dominion of Canada shows the total population on June 1, 1921, as 8,788,483, as compared with 7,206,043 on June 1, 1911, an increase of 1,581,840, or 21.95 per cent in the decade. On June 1, 1929, the population of the Dominion was officially estimated at 9,796,800. From 1911 to 1921, there occurred in the four western provinces an increase of population from 1,720,601 to 2,480,664, or 44.2 per cent, while the five eastern provinces increased from 5,471,023 to 6,295,189, an increase of 824,166 persons, which, though absolutely larger than the figure for the

west, constituted an increase of only 15 per cent over the 1911 population. Ontario and Quebec still contained the major portion of the population; in 1921, 60 per cent, as compared with 63 per cent in 1911. The density of population in Canada was 2.44 to the square mile. In 1921, the ratio of males to females was 515 males to 485 females per 1000 of population, as compared to 530 males to 470 female per 1000 in 1911. The decline was accounted for by the loss of 60,000 Canadian men during the War and the checking of immigration. Of Canada's total population, 4,436,041, or 49.52 per cent, were classed as rural in 1921, as compared with 3,933,696 in 1911. The urban population numbered 4,352,442 in 1921 and 3,272,947 in 1911. In 1921, there were only 83,599 more persons in the rural communities than in the urban; in 1911, the excess was 660,749. The census of 1921 showed that for the first time Canada possessed cities of more than a half-million population. These were Montreal and Toronto. Populations of important cities in 1921, with 1911 shown in parentheses, were: Montreal, 618,506 (490,504); Toronto, 521,893 (381,833); Winnipeg, 179,087 (136,035); Vancouver, 117,217 (100,401); Hamilton, 114,151 (81,969); Ottawa, 107,843 (87,062); Quebec, 95,193 (78,710); Calgary, 63,305 (43,704); London, 60,959 (46,300); Edmonton, 52,821 (31,064); Halifax, 58,372 (46,619). Births in 1926 were 232,205; marriages, 66,570; and deaths, 107,318. Immigrant arrivals in 1928 totaled 151,597, of whom 25,007 came from the United States and 50,872 from the United Kingdom. In 1913 immigrant arrivals totaled 402,432; of whom 139,009 came from the United States and 150,542 from the United Kingdom. The racial distribution of the population was, in percentages: English (1921), 28.96 and (1911), 25.30; Irish (1921), 12.60 and (1911), 14.58; Scotch (1921), 13.36 and (1911), 13.85. The total population of the British races was 54 per cent in 1911 and 55 per cent in 1921.

The population of Canada on June 1, 1929, by provinces and territories as estimated by the Dominion Bureau of Statistics, was as follows: Prince Edward Island, 86,100; Nova Scotia, 550,400; New Brunswick, 419,300; Quebec, 2,690,400; Ontario, 3,271,300; Manitoba, 663,200; Saskatchewan, 886,700; Alberta, 640,000; British Columbia, 591,000; Yukon Territory, 3000; and North West Territories, 9400.

**Education.** Throughout the Dominion of Canada, public education is a matter of provincial concern. In Quebec, there are two distinct systems of education in each of which the teaching of religion occupies a prominent position—the Protestant and the Roman Catholic systems. In the academic year ended in 1926, there were 2,272,415 pupils in attendance at educational institutions in Canada. Of the above, 1,915,703 were enrolled in ordinary day schools under public control, the average daily attendance numbering 1,555,620; in 1911, 1,350,821 pupils were enrolled, the average attendance being 866,956. Pupils attending vocational schools numbered 88,961 in 1926. There were 17,818 students in private business colleges, and 70,959 in other private schools under college grade. University students in regular courses numbered 44,483 and college students in regular courses, 17,917. Students in classical colleges numbered 10,695. There were, in 1928, 63,840 teachers in schools under public control, 12,

069 males and 51,771 females; in 1911, there were 40,502 teachers. The total expenditures on schools under public control was \$122,701,259, of which governments contributed \$16,860,596 and local taxation, most of the balance. Higher education in Canada is carried on in 23 universities and 83 colleges, including 21 classical colleges in Quebec. Of the universities, six are state controlled (New Brunswick, Toronto, Manitoba, Saskatchewan, Alberta, and British Columbia); four others are undenominational (Dalhousie, McGill, Queen's and Western); while the remainder are denominational. The number of students registered in universities during the year 1926 was 12,975 in state-controlled institutions (teaching staff, 1388); 7485 in other undenominational institutions (staff, 903); and 24,023 in denominational institutions (staff, 1750); making a grand total of 44,483, with a teaching staff of 4041.

**Agriculture.** The economic prosperity of Canada continues dependent primarily upon agriculture. Farm products comprised 55 per cent of Canadian exports, the most important being wheat and flour, pork products, and dairy products. The total area under field crops in 1927 was 53,782,965 acres, as against 57,189,681 in 1922, and 35,375,430 in 1913. The total values of field crops for 1913, 1922, and 1923 were estimated as follows:

	1913	1922	1926
Wheat	\$156,462,000	\$389,419,000	\$445,180,000
Oats	128,893,000	185,455,000	184,108,000
Barley	20,144,000	33,335,300	51,927,000
Rye	1,524,000	18,701,200	9,385,000
Peas	4,382,000	5,818,200	4,609,000
Beans	1,505,000	3,713,800	3,060,000
Buckwheat	5,320,000	8,140,800	8,638,000
Mixed grains	8,685,000	16,500,700	22,747,000
Flaxseed	17,084,000	8,638,900	9,613,000
Corn for husking	10,784,300	11,509,700	7,780,000
Potatoes	38,418,000	50,320,000	71,578,000
Turnips, mangolds, etc.	18,643,000	23,886,000	20,836,000
Hay and clover	124,696,000	194,950,000	178,526,000
Alfalfa	2,819,200	10,295,000	28,191,000
Grain hay			48,154,000
Fodder corn	12,566,000	29,197,600	23,685,000
Sugar beets	906,000	1,500,000	8,410,000

The total value of the principal Canadian field crops in 1928, according to the preliminary estimate of the Dominion Bureau of Statistics, was \$1,051,043,000, as compared with \$1,134,102,000 in 1927. This represented a decline of 7.3 per cent.

The total value of all field crops in 1913 was \$552,771,500. Canada's most important crop is wheat, the total yield for the year 1928 being finally estimated at 550,482,000 bushels from an area of 24,114,846 acres, as compared with 399,780,400 bushels from 22,422,693 acres in 1922, and 231,717,000 bushels in 1913 from 11,015,000 acres. The wheat crop of 550,482,000 bushels in 1928 was the largest on record for Canada, and compared with 440,025,000 bushels, the previous year's record crop, and 407,136,000 bushels, the record crop of 1926. The average yield per acre for all wheat in 1928 was 22.3 bushels, as compared with 17½ bushels in 1922, 26 bushels in 1915, and 21 bushels in 1913. Oats yielded in 1928 the total of 474,242,000 bushels from 13,240,000 acres, as compared with 491,239,000 bushels from 14,541,220 acres in 1922, and with 404,669,000 bushels from 10,434,000 acres in 1913. The average yield per acre was 35.3 bushels in 1928, 33¾ bushels in 1922, and 38.78

bushels in 1913. Barley yielded the total of 96,938,000 bushels from 3,506,000 acres in 1927, as compared with 71,865,300 bushels from 2,599,520 in 1922 and with 48,319,000 bushels from 1,613,000 acres in 1913. The average yields per acre were 27.6 bushels in 1927, 27½ bushels in 1922, and 29.96 bushels in 1913.

Flaxseed in 1927 yielded 4,353,000 bushels from 475,931 acres, as compared with 5,008,500 bushels from 565,479 acres in 1922 and 17,539,000 bushels from 1,522,800 acres in 1913. The yield per acre was 8.1 bushels in 1927, as against 8.85 bushels in 1922 and 11.30 bushels in 1913. The total yields of root and fodder crops in 1927, as compared with those of 1922 and 1913, are given in the following table:

	1913		1922		1927	
	Area Acres	Yield Cwt.	Area Acres	Yield Cwt.	Area Acres	Yield Cwt.
Potatoes	473,500	47,126,400	683,594	55,745,300	545,918	48,862,000
Turnips, mangolds, etc.	186,400	40,072,800	224,256	43,973,500	201,782	84,576,000
		Ton		Ton		Ton
Sugar beets	17,000	148,000	20,725	190,400	47,494	224,500
Hay and Clover	8,169,000	10,859,000	10,001,667	14,488,200	10,069,519	14,916,000
Alfalfa	93,560	237,770	305,933	806,400	858,043	2,058,000
Fodder corn	308,650	2,616,300	654,624	5,879,000	579,888	4,720,000

For the year 1926, the quantities and values of various fruits produced commercially in Canada were as follows; the corresponding figures for 1922 and quantities only for 1910 being given, if available: apples, 2,984,230 barrels, value, \$15,776,222 (5,048,405 barrels, value \$24,692,182; 10,618,666 bushels); pears, 214,010 bushels, value \$567,127, (461,227 bushels, value \$668,854; 504,171 bushels); plums and prunes, 319,130 bushels, value \$520,182 (408,438 bushels, value \$522,393; 508,994 bushels); peaches, 226,465 bushels, value \$527,663 (577,561 bushels, \$668,854; 646,826 bushels); cherries 180,345 bushels, value \$557,266, (202,740 bushels, \$481,850; 238,974 bushels). The gross agricultural wealth of Canada for 1926 was estimated to be \$7,817,718,000, as compared with \$6,774,461,000 in 1922. The total estimated agricultural revenue of Canada in 1926 was \$1,668,175,000, as compared with \$1,389,289,000 in 1922, \$1,383,058,000 in 1921, \$2,011,201,000 in 1920, and \$2,109,291,000 in 1919, which was the peak year.

The numbers of farm live stock for the Dominion, 1927, were estimated as follows, the corresponding numbers for 1922 and 1913 (where available) being given within parentheses: horses, 3,422,000 (3,648,871; 2,866,008); mules, 7554 (9202); cattle, 9,172,000 (9,719,869; 6,849,433); sheep, 3,204,000 (3,263,525; 2,598,470); swine, 4,095,000 (3,915,684; 2,753,964); poultry, 49,641,472 (42,930,562); rabbits in British Columbia, 45,480 (51,623). The total production of farm eggs in Canada for the year 1926 was approximately 237,080,399 dozens, as compared with 194,058,468 dozens in 1922, and 123,071,034 dozens in 1910, the total estimated value being \$66,198,285 in 1926, as compared with \$48,490,578 in 1922. The total production of wool in Canada in 1927 was placed at 18,673,000 pounds, as compared with 18,527,292 pounds in 1922, and 6,933,955 pounds in 1913.

The total agricultural revenue of Canada for 1928, \$1,730,304,000, was 2.8 per cent less than the previous year, the principal reductions being due to declines in the value of field crops (principally grains) and tobacco. Agricultural revenue by provinces, in the order of their importance, was as follows: Ontario, \$500,821,000;

Saskatchewan, \$392,603,000; Quebec, \$277,050,000; Alberta, \$264,028,000; Manitoba, \$148,867,000; British Columbia, \$50,715,000; Nova Scotia, \$40,162,000; New Brunswick, \$34,307,000; and Prince Edward Island, \$21,750,000. Increased revenue was reported for Nova Scotia, New Brunswick, Manitoba, and British Columbia. The gross agricultural wealth of Canada for 1928 is estimated at about \$8,027,301,000, an increase of \$19,353,000 over the previous year.

Forestry. The total land area of Canada is approximately 3,547,000 square miles. The area covered by existing forests is approximately 1,227,000 square miles, some of which is agricultural land. The estimated stand of timber of merchantable size in Canada in 1926 was 242

billion cubic feet, of which 194 billion cubic feet were soft wood and 47 billion, hard wood. The manufacture of lumber, lath, shingles, and other products and by-products of the saw-mill, forms the principal industry in Canada depending on the forest for its raw materials. The lumber cut in 1925 was 3,888,920 thousand feet, board measure, valued at \$99,725,519; shingles cut, 3,156,261 thousand feet; value, \$11,154,773; lath cut, 1,292,963 thousand feet, value \$6,415,927; in 1913 the lumber cut was 3,816,642 thousand feet; value, \$65,796,438; shingles cut, 1,485,279 thousand feet; value, \$3,064,641; lath cut, 739,678 thousand feet; value, \$1,783,283. The total value of all classes of forest products in 1925 was \$209,276,561, as compared with \$312,683,509 in 1920, and \$177,120,000 in 1913. The pulp and paper industry of Canada has made rapid progress in the last two decades. In 1926 there were in existence in Canada 44 pulp mills, 36 combined pulp and paper mills, and 34 mills making paper only; in 1901, there were 25 mills all told. The industry in Canada includes three forms of industrial activity, i.e., the operations in the woods with pulpwood as a product, the manufacture of pulp, and the manufacture of paper. The total production of pulp in 1926 was 3,299,791 tons, valued at \$115,154,199, of which 2,167,813 tons were used in Canadian pulp mills and 1,061,978 cords were exported unmanufactured. In 1913 total production was 2,144,064 cords; value, \$14,313,939; used in Canadian pulp mills, 1,109,034 cords; exported unmanufactured, 1,035,030 cords. After 1902 the exports of raw pulpwood went exclusively to the United States and amounted by 1927 to 1,541,769 cords. The total pulp production in 1926 was 3,299,791 tons; value, \$115,154,199; the amount of mechanical pulp produced was 1,901,268 tons; value, \$44,800,257; and the amount of chemical fibre, 1,251,178 tons, valued at \$69,220,427. The earliest accurate detailed statistics available concerning the industry were those of 1917, when the total pulp production was 1,404,308 tons, valued at \$65,515,335; in 1913, the total production was 854,624 tons. Canada's paper production in 1926 was 2,266,143 tons, valued at \$158,182,227; in 1917, production was 853,689 tons, valued at \$53,750,341.

The United States market absorbs annually about four-fifths of Canada's pulp and paper shipments; and two-thirds of the newsprint paper consumed in the United States is either of Canadian manufacture or made from wood or wood pulp imported from Canada. Exports of wood pulp to the United States in the year ended Mar. 31, 1928, totaled 641,000 tons, valued at \$37,815,000; exports of pulpwood amounted to 1,502,000 cords, valued at \$15,183,000; and exports of paper were valued at \$118,405,000.

**Fisheries.** The total value of the products of the Canadian fishing industry in the calendar year 1927 was \$49,460,600, compared with \$49,241,339 for 1920 and \$33,207,748 in 1913. In 1927 the total capital invested in the fisheries was \$51,147,725. The number of employees engaged in the primary operations of fishing was 63,303 in 1927, and in canning and curing establishments, 16,817; a total of 80,120. In 1928 the output of the Canadian fisheries was valued at \$54,971,319, of which amount British Columbia accounted for 48 per cent of the total and the Maritime Provinces, for 32 per cent. Perhaps 60 per cent of the annual capture is an average export, of which the United States takes approximately one-half and Great Britain, one-quarter. In the fiscal year 1927-28, total exports amounted to \$48,076,000, of which \$10,162,000 went to the United States.

**Minerals.** The value of the mineral production of Canada for 1927 was (the production in 1922 and 1913 is shown in parentheses): metal-

vital economic importance. In 1926 there were 40,352 miles of steam railways in operation, as compared with 29,304 miles in 1913. Of the 1926 mileage, 22,681 miles were owned by the Government, as compared with 2734 miles in 1914. Much of the increase in government-owned railways was after 1915, when it became necessary for the Government to take over and operate the National Transcontinental Railway. Thereafter, the Government acquired control of the Canadian Northern, Grand Trunk Pacific, and the Grand Trunk proper, the first and third in 1918, and the second in 1919. The last step in the consolidation of the various railways under government operation and control was taken on Jan. 30, 1923, when the unification of the Grand Trunk and the Canadian National Railways was provided for, and the act to incorporate the Canadian National Railways was brought into effect. In addition to the above roads, the Central Vermont Railway is a part of the Canadian National Railway System. Steam-railway statistics for 1926, with 1913 figures shown in parentheses, were: total train miles, 60,176,000, (67,320,000); passengers carried, 42,686,000 (46,185,968); freight, 122,477,000 tons (106,992,710 tons); gross earnings, \$493,600,000 (\$259,702,703); operating expenses, \$389,603,452 (\$182,011,690). Up to Dec. 31, 1926, the total value of government aid granted to steam railways in Canada, exclusive of the two government railways, Intercolonial Railways System, and the Prince Edward Island Railway,

		Quantity		Value	
		1913	1927	1913	1927
Coal	tons	15,012,178	17,411,505	\$37,334,940	\$61,809,672
Gold	ounce	802,973	1,844,544	16,598,923	38,130,107
Nickel	pound	49,876,772	66,798,717	14,903,032	15,262,171
Copper	pound	76,976,925	140,141,823	11,753,606	17,194,955
Silver	ounce	31,845,803	22,613,134	19,040,924	12,747,024
Lead	pound	37,662,703	810,183,455	1,754,705	16,411,980
Asbestos	tons	161,086	275,461	3,849,925	10,624,106
Natural gas	thousand feet	20,477,838	20,529,873	3,809,381	7,741,661
Cobalt	pound	928,383	877,875	605,589	1,763,543
Cement	barrel	8,658,805	10,065,865	11,019,418	14,391,897

lics, \$113,135,582 (\$62,120,291; \$66,361,351); nonmetallies, \$88,498,024 (82,642,210; \$79,273,461); structural materials and clay products, \$42,986,402 (1922, \$39,534,741). For principal products of the mineral industry in 1927, as compared with 1913, see above table. Mineral production in 1928 was estimated at \$271,000,000. A notable increase was the output of copper during 1928, 202,696,046 pounds valued at \$28,598,249. The production of blister copper was 124,824,371 pounds valued at \$18,322,883. The output of petroleum products from Canadian plants in 1928 was valued at \$83,122,172.

**Manufactures.** According to the census of 1926, there were in Canada 22,708 manufacturing establishments, as compared with 19,218 in 1910. In 1926 the total number of employees was 581,527, the amount of capital invested \$3,808,289,981, and the output was valued at \$3,247,803,000. In 1910 the total number of employees was 515,203, capital \$1,247,583,009, and output \$1,165,975,639. The cost of materials was \$1,728,024,000 in 1926, leaving \$1,519,279,000 as the value added by manufacture; in 1910 the cost of materials was \$601,509,018 and the value added by manufacture, \$564,466,621. The salaries and wages of employees in 1926 were \$576,016,171, as compared with \$283,311,505 in 1910.

**Railways.** As Canada is nearly 4000 miles wide, railway transportation is a problem of

amounted to \$225,467,753. Of this sum, \$176,093,510 represented aid granted by the Dominion Government, \$33,360,615 that granted by the provincial governments, and \$15,413,628 that granted by the municipalities. Besides this financial aid, the Dominion and provincial governments had guaranteed railway bonds to the amount of \$484,536,819.

**Telephone and Telegraph.** At the end of 1927, there were 1,259,987 telephones in Canada, an increase of 58,979 during the year. In 1928 there were in use 337,971 miles of telegraph wire, an increase of 14,432 miles over 1927, and 53,777 miles of pole line, 1046 miles more than in the previous year. Operating expenses in 1928 were \$11,647,063, an increase of 9 per cent above the 1927 figure; and the gross revenue amounted to \$14,740,741, which was 13.5 per cent above that of 1927. In 1928, 16,802,954 telegrams were transmitted. On July 1, 1929, the Canadian National Telegraphs acquired and began operating the complete Western Union Telegraphs in the Maritime Provinces.

**Canals.** The canal system of the Dominion involves important commercial waterways as follows: Sault Ste. Marie Canal, 1.30 miles in length on the St. Mary's Rapids; the Welland Canal, 26.75 miles in length from Port Dalhousie to Port Colborne; the St. Lawrence Canals involving the Lachine, Soulanges, and other canals around rapids; the Chambly Canal in Quebec; St. Peter's Canal, Cape Breton Island,



N. S.; the Murray Canal on the Isthmus of Murray; the Ottawa Canals on the Ottawa River; the Rideau Canal between Ottawa and Kempton; the Trent Canal, 126¼ miles; in Ontario; and the St. Andrew's Canal in Winnipeg. The Canadian canal at Sault Ste. Marie in 1928 carried a freight tonnage of 2,007,137, as against the total of 86,992,254 tons for both the Canadian and the United States Canals. The freight tonnage for the other canals for 1928 was as follows: Welland, 7,439,617 tons; St. Lawrence, 8,411,542 tons; Chambly, 179,868 tons; St. Peter's, 52,848 tons; Murray, 1,385 tons; Ottawa, 497,786 tons; Rideau, 51,999 tons; Trent, 36,311 tons; and St. Andrews, 51,948 tons.

**Shipping.** For the fiscal year ended Mar. 31, 1927, a total of 113,604 vessels (21,382 sea-going) of 66,349,000 tons register (23,224,000 sea-going) entered Canadian ports in the sea-going, coastwise, and rivers and lakes trades, as compared with 140,597 (18,320 sea-going) vessels of 72,667,084 tons register (14,982,393) for the fiscal year 1914. Clearances in 1927 totaled 111,737 vessels (20,923 sea-going) registered tonnage 65,542,000 (22,925,000 sea-going); in 1914 clearances numbered 135,542 vessels (17,695 sea-going), registered tonnage 66,707,541 tons (14,586,093 sea-going).

**Public Finance.** During the fiscal year ending Mar. 31, 1928, the total revenue of the Dominion was \$412,580,000; in 1923 it amounted to \$384,790,135 and in 1914 to \$163,174,395. Expenditures, including those chargeable to the consolidated fund and to the capital account, totaled \$333,730,000 for the fiscal year 1927-28, \$322,069,003 for 1922-23, and \$186,241,048 for 1913-14. The net public debt of Canada on Mar. 31, 1929, no credit being taken for non-active assets, was \$2,215,504,705; on Mar. 31, 1923, it was \$2,430,202,552; and on Mar. 31, 1914, it was \$335,996,850. Details of receipts and expenditures for the fiscal years 1925-26, 1926-27, and 1927-28 are shown in the accompanying table.

#### GOVERNMENT RECEIPTS AND EXPENDITURES

[Thousands of Canadian Dollars]

	1925- 26, actual	1926- 27, actual	1927- 28, budget
Ordinary receipts	380,745	398,696	412,680
Customs	127,355	141,969	163,600
Excise	42,924	48,513	57,000
War-tax revenue:			
Income tax	55,572	47,386	55,800
Sales, checks, transportation, etc.	83,097	105,613	88,000
Miscellaneous taxes	3,627	8,167	8,170
Canals	921	(*)	(*)
Post office	30,334	29,069	31,000
Interest on investments	2,535	8,559	10,190
All other	13,881	14,420	14,320
Special receipts	2,148	1,757	6,900
Ordinary expenditures	320,660	319,548	333,730
Debt charges	131,576	129,875	128,700
National defense	10,717	13,086	15,950
Pensions	87,199	37,903	39,380
Public works, chargeable to income	13,416	11,178	15,500
Railways and canals, chargeable to income	8,038	(*)	1,369
Post office	30,500	31,007	32,250
Soldiers' civil re-establishment	7,706	6,977	6,820
Subsidies to Provinces	12,375	12,517	12,517
All other	74,133	77,205	81,244
Special expenditures	6,521	4,958	7,115
Capital expenditures	16,798	19,559	21,405
Loans and advances, non-active	11,206	11,569	2,415

\* Included under "All other."

The 1928-29 budget provided for revenues of \$419,480,000 and expenditures of \$364,665,000.

**National Wealth.** The national wealth of Canada for 1920 was estimated by the Dominion statistician at \$22,482,841,122. The major items were: Farm values (land, buildings, implements and machinery, and live stock, Census 1921), \$6,592,351,789; forest (estimated value of accessible raw materials, pulp wood, and capital invested in woods operations), \$1,244,343,100; steam and electric railways (investment in road and equipment, \$2,868,000,000); urban real property, \$5,944,000,000; stocks of raw materials and manufactured goods, \$1,316,000,000; household furnishings, clothing, carriages, motors, etc., \$1,144,000,000. These estimates were based on 1920 when money values of commodities reached their peak. The natural income of Canada was placed at between \$4,500,000,000 and \$5,000,000,000. In 1925 the national wealth was placed at \$25,673,174,000 and in 1927 at \$27,687,000,000, or a per capita of \$2909.

Foreign investments in Canada in Jan. 1, 1929, were officially estimated at \$5,742,043,000, of which the United States accounted for \$3,286,786,000 and Great Britain for \$2,209,517,000. Investments of the United States in Canada included \$857,606,000 in government securities; \$509,463,000 in railways; \$301,376,000 in other public utilities; \$450,506,000 in the pulp, paper and lumber industries; \$224,914,000 in mining; and \$241,316,000 in the metal industries.

**Commerce.** The foreign trade of Canada during the fiscal year ending Mar. 31, 1929, showed an increase in value as well as in volume, compared with that for the previous fiscal year, 1928. The total value of the imports for the fiscal year 1929 was \$1,265,679,091; for 1928, \$1,108,956,466; and for 1914, \$619,193,998; while the exports of Canadian produce in 1929 were valued at \$1,363,586,672; in 1928, at \$1,228,207,606; and in 1914 at \$431,588,439. In 1929 the total trade with the United States amounted to \$1,389,871,205, imports accounting for \$868,056,680 of this amount, and exports, foreign and domestic, for \$521,814,525; while in 1928 the trade totaled \$1,216,080,756, imports amounting to \$719,436,237 and exports to \$496,644,519. In 1914 the total trade with the United States was \$559,674,963, imports from the United States being valued at \$396,302,138 and exports to the United States at \$163,674,903. The trade of Canada with the United Kingdom during the year ending Mar. 31, 1929, amounted to \$625,089,530; imports amounted to \$194,020,573, and exports, foreign and domestic, to \$431,668,957. During 1928, the total trade was valued at \$598,659,210, the imports accounting for \$185,895,857 of this amount, and exports for \$412,763,353; and during 1914 the total trade was valued at \$410,497,018, of which imports amounted to \$117,135,343 and exports to \$299,361,675.

During the year ended Mar. 31, 1929, the trade balance was favorable to Canada by \$123,093,984, as compared with a favorable balance in 1928 of \$141,499,831, and an unfavorable balance in 1921 of \$29,730,763, and for the pre-war year 1914 of \$163,756,774. From 1916 to 1920, Canada's exports exceeded her imports each year by a very large amount, due principally to abnormal conditions which existed during the war period and the reconstruction period following the termination of hostilities. Prior to 1916, the trade balance was unfavorable to

## IMPORTS FOR CONSUMPTION, BY PRINCIPAL COMMODITIES, FISCAL YEARS ENDED MARCH 31

Commodity	Quantity		Value (thousands of dollars)		
	1914	1929	1914	1929	
Total imports *					
Corn	1000 bu.	7,198	14,128	619,194	1,265,679
Vegetables		.....	.....	4,692	13,792
Fruits		.....	.....	3,801	9,299
Coffee, green	1000 lbs.	(b)	25,126	15,733	35,876
Tea	"	37,628	39,425	6,650	11,752
Sugar		(b)	.....	(b)	31,757
Beverages, alcoholic		.....	.....	8,373	48,844
Tobacco, unmanufactured	1000 lbs.	17,598	18,726	5,110	6,766
Furs		.....	.....	3,847	17,165
Hides and skins		.....	.....	8,834	12,429
Leather		.....	.....	8,454	10,997
Cottons		(b)	.....	(b)	63,293
Cotton, raw	1000 lbs.	(b)	138,734	(b)	28,204
Flax, hemp, and jute products		.....	.....	9,044	15,854
Silk and its products *		.....	.....	11,496	29,615
Wool and its products		.....	.....	31,448	54,428
Worsted and serges	1000 yds.	(d)	10,325	(d)	13,727
Wood, unmanufactured or partially manufactured		.....	.....	16,617	16,639
Wood, manufactured		.....	.....	7,914	12,386
Paper		.....	.....	7,915	13,649
Rubber, unmanufactured	1000 lbs.	4,451	77,704	3,250	17,410
Coal, anthracite	tons	(b)	3,882	(b)	28,529
Coal, bituminous	tons	(b)	13,224	(b)	25,897
Oils, petroleum, crude *	1000 gal.	(b)	920,651	(b)	37,660
Petroleum, refined *	"	(b)	174,935	(b)	23,678
Rolling mill products		.....	.....	38,362	60,084
Engines and boilers *		.....	.....	4,522	19,307
Farm implements		.....	.....	7,541	40,292
Machinery		.....	.....	26,237	60,262
Automobiles and trucks	number	6,288	49,864	7,313	42,968
Automobile parts *		(b)	.....	(b)	55,761
Metals		(b)	.....	(b)	422,049
Silver in bars, etc.		(b)	.....	(b)	1,029
Chemicals		.....	.....	17,179	37,723
Vegetable oils		.....	.....	3,148	10,809
Books and printed matter		.....	.....	8,016	16,539

\* Includes the following amount for parcel post and parcel express which are not shown under the specified commodity: 1914, \$3,800,914.

† Not reported separately in 1914.

\* Excludes artificial silk (rayon) and its products.

\* Includes steam, fire, locomotive, automobile, and other internal combustion engines.

† Figures for 1914 are not comparable with later years. † Excludes engines.

## DOMESTIC EXPORTS, BY PRINCIPAL COMMODITIES, FISCAL YEARS ENDED MARCH 31

Commodity		Quantity		Value (thousands of dollars)	
		1914	1929	1914	1929
Total domestic exports *					
Cattle	number	219,729	240,916	431,588	1,363,586
Meats		.....	.....	7,907	14,694
Bacon and hams	1000 lbs	(b)	36,658	5,815	19,184
Beef, fresh	"	(b)	43,285	(b)	7,874
Milk, and fresh cream	1000 gals	(b)	6,588	(b)	6,990
Milk, condensed, etc.	1000 lbs	(b)	38,563	(b)	6,060
Cheese	"	144,478	112,609	(b)	3,720
Fish		(b)	.....	18,869	25,181
Barley	1000 bu	18,032	35,699	(b)	34,982
Oats	"	34,997	15,657	6,514	25,743
Wheat		120,427	370,459	13,380	10,241
Wheat flour	1000 bbls	4,832	11,405	117,719	428,524
Vegetables		.....	.....	20,581	65,117
Apples	1000 bbls	947	1,080	1,578	6,083
Sugar		(b)	.....	8,465	4,867
Beverages, alcoholic		.....	.....	(b)	4,329
Whisky	1000 gals	405	2,355	1,050	30,118
Fur skins, undressed		.....	.....	1,038	24,122
Hides and skins		.....	.....	5,558	24,250
Leather		.....	.....	9,263	9,479
Wood, unmanufactured		.....	.....	3,214	10,655
Planks and boards	1,000,000 ft	999	1,696	(b)	91,675
Pulpwood	1000 cords	1,089	1,406	19,514	47,663
Wood pulp	1000 long tons	283	798	7,889	14,187
Paper, except printing matter		.....	.....	6,365	54,895
Newsprint	1,000,000 lbs	586	4,526	12,742	148,394
Rubber manufactures		.....	.....	11,387	142,843
Farm implements		.....	.....	197	30,582
Automobiles and trucks	number	6,306	108,566	7,949	15,870
Copper and products		.....	.....	8,572	43,059
Lead and products		.....	.....	9,867	28,046
Nickel	1000 lbs	(b)	107,482	8	11,130
Gold, ore, dust, etc.		.....	.....	(b)	23,880
Iron		.....	.....	(b)	12,396
Silver ore and bullion	1000 ozs	(b)	20,555 *	(b)	82,256
Chemicals and related products		.....	.....	(b)	11,839
		.....	.....	4,773	19,438

\* Total excludes gold, silver, and copper coins and refined gold bullion.

† Not reported separately in 1914.

Canada for a number of years. The exports of Canadian produce, with portions exported to the British Empire and foreign countries for the fiscal years 1914, 1920, 1921, 1922, and 1929 were:

<i>Fiscal Years</i>	<i>Total Exports</i>	<i>To British Empire</i>	<i>To Foreign Countries</i>
1914	\$ 431,588,439	\$238,642,517	\$192,945,922
1920	1,239,492,098	561,791,887	677,700,211
1921	1,189,163,701	403,452,219	785,711,482
1922	740,240,680	345,835,410	394,405,270
1929	1,363,586,672	429,730,485	933,856,187

Canada vastly improved her position among the principal exporting countries of the world after 1913. In 1913 Canada occupied tenth place as an exporting country, but by 1927 she had advanced to fifth place, being surpassed by the United States, the United Kingdom, France, and Germany. With respect to the principal importing countries, Canada occupied eighth place in 1913, and fifth place in 1927.

**History.** Canada's loyalty in the World War was unquestioned. Old party strifes were dropped and the imperial bonds, which many had seen loosened under dominion government, tightened, as Canada hastened to proffer aid to the mother country. Parliament assembled on August 18, 1914, passed immediately eight war bills, and appropriated \$50,000,000 for war expenditures. As part of her naval contribution, Canada offered two powerful submarines, purchased from Chile, and the cruisers, *Niobe* and *Rainbow*. The call to the colors met with generous response. In three weeks, 32,000 men were in training at Valcartier, almost 10,000 others were under arms, and 150,000 volunteers were waiting only to be called. It is significant that 2400 French-Canadians joined the first contingent. The First Canadian Division arrived in England Oct. 14, 1914, and reached the war area Feb. 11, 1915. The Second Division reached France in the fall of 1915; the Third and Fourth in 1916; the Canadian Army Corps was formed late in 1915. Up to the passage of the Draft Act in August, 1917, 465,984 men has voluntarily enlisted. By the act, in 1917-18 83,355 more men were obtained. In all services, 595,441 Canadians were under arms during the period of the War. Total casualties were 210,000, divided as follows: killed in action, 51,670; died of disease, etc., 5000; wounded, 149,700; prisoners of war, 3730. The Canadian Army Corps, as part of the First British Army, saw service at the second battle of Ypres (1915), the battle of the Somme (1916), the taking of Vimy Ridge, Arleux, Fresnoy, and Hill 70 (1917), the battle of Amiens, Arras, and Cambrai (1918). Canadians, too, saw service in Russia, Macedonia, and Palestine. To the ships above mentioned, there were added in the Canadian fleet a mother-ship for the submarines, a mine-sweeping service, and a large number of motor launches. The personnel of the navy at the War's conclusion consisted of 749 men and officers, besides 4500 volunteers in the reserve engaged in patrol duty. About 13,000 men were in the Royal Air Force; there were Canadians on British ships, and in the medical, engineering, forestry, radiotelegraph services. Canadian shipyards turned out vessels and factories were converted into munition plants. The problem of the repatriated soldier was met with foresight. In 1916 provision was made for the vocational training of disabled soldiers; in 1918 a department was created for the care of veterans and their restoration to peace-time activities. Per-

haps the most important single measure was the Soldier Settlement Act whose purpose was to settle the men on the land. Aside from the 160 acres they were entitled to as civilians, men might make application for an additional homestead. Funds were to be appropriated from which loans might be made for the purchase of the land, improvements, and live stock.

Throughout the War, the Unionist party, with Sir Robert Borden as Premier, was in control of the Government. Sir Wilfred Laurier's opposition was consistently stormy. His patriotism, of course, was not to be questioned, but the attitude of some of his party was more than lukewarm. Racial animosities revived and became especially heated when, with the general elections of 1917 in sight, Sir Robert Borden introduced a measure for compulsory military service. It was hotly opposed by the Liberals, and among the French Canadians feeling against it ran high. In Montreal, draft riots in July and a general strike called in August were illustrations of the continued violent opposition. On October 12, Sir Robert Borden attempted to strengthen his government by including five Liberals in his cabinet. A group of laws was also passed to "purify" the electorate. The elections of December 17 left the balance of power in the hands of the Liberal Unionists (i.e., supporters of Sir Robert Borden), as the Unionists had only won 108 seats out of 235. In Quebec, 62 out of 65 Parliamentary districts were won by anti-draft Liberals, and in January, 1918, the Quebec Parliament debated a secession resolution. Rioting and street fighting occurred in the spring.

Labor also was pressing its demands. In the difficult transition period after the Armistice, these demands became especially insistent. Official gestures, like the appointment (on April 9, 1919) of a Royal Commission to consider labor questions, were unavailing. In spite of the hostility of the Trades and Labor Congress the "one big union" movement took on impetus, particularly in the West, but also in Toronto. In June, 1919, radicalism reached its peak when a local labor dispute in Winnipeg brought on a general strike in which every labor union in the city participated. Supported by returned soldiers, the workers took full control, governing the city through a local council. The affair blew over, fortunately without bloodshed, and the end of the year saw old conditions restored.

New leaders, too, appeared after the War. Sir Wilfred Laurier died Feb. 17, 1919, and in August, Mr. William Mackenzie King was elected as the head of the Liberal Party. In July, 1920, Sir Robert Borden resigned and was succeeded by Mr. Arthur Meighen, who remained in power, however, only until December, 1921, when the elections brought the Conservatives down in defeat. The contest, revolving about a high-tariff issue, was a heated one with five parties in the field. Women voted for the first time. The result was unexpectedly decisive. The Premier and ten members of the cabinet lost their seats, the Conservatives winning only 51 seats all told. One of the surprises was the strength of the Progressives, or Farmers' Party, which won 65 seats. The Liberals, with 117 seats, assumed the government and Mr. King became Premier.

For the most part, the Liberals and the Progressives worked in harmony. The latter were led first by T. A. Crerar and later by Robert Forke. The most important issues on which

there was a common sentiment were a low tariff with reciprocity between Canada and the United States, unified control of all government railways under a single board of management, and encouragement of immigration for the benefit of the rural districts. These and occasional constitutional questions, such as the reform of the Senate, continued for many years to be the leading domestic issues in Canadian politics. Immigration particularly occupied the public mind and the 1923 session of Parliament was given over almost entirely to its consideration. The serious decline in immigration from the United States (only 22,000 Americans had entered in 1922-23, as compared with 139,000 in 1913), and the none too rapid development of the Western provinces, compelled the Government to apply itself to the formulation of an elaborate programme. Plans were laid for large expenditures in propaganda and in establishing foreign agencies; for attracting immigrants from Great Britain and the Scandinavian countries; and for the removal of restrictions on immigration from the late enemy countries.

In 1924 an agreement was made with Great Britain providing for the settlement, over a three-year period, of 3000 British families in Canada, the British government to give £300 to each family for the purchase of farm equipment and Canada to place the immigrants on farms. But perhaps the greatest incentive to immigration was the announcement, Dec. 15, 1925, of an agreement with the Imperial authorities by which transportation rates for immigrants were to be drastically reduced. A year later, these low rates were still further lowered for farmers, farm laborers, and domestics. The cost of making these cuts was shared between the British and Canadian governments and the steamship companies. These various measures presently showed results. Whereas in 1924-25 total immigration had fallen to 111,362, including only 15,914 from the United States, and 53,178 from the British Isles, in the fiscal year 1927-28, the total reached 151,597, including 25,007 from the United States and 50,872 British. During the latter year, 39,387 Canadians living in the United States also were repatriated.

While the immigration tide was at low ebb, the apparent inadequacy of the government's efforts to increase it, together with dissatisfaction over the failure to reduce tariff schedules, caused the Progressives to hold aloof from the cabinet, which was composed entirely of Liberals. Being in a paper minority, Mr. King's government functioned precariously; but the 1924 session proved a quiet one and he maintained his position. Perhaps the most important measure passed was that for the union of Presbyterians, Methodists, and Congregationalists into the United Church of Canada. (See CANADA, THE UNITED CHURCH OF). The union became effective in 1925. The principal opponents of the union were a group of Presbyterians, and they maintained a Presbyterian organization while the other two denominations were completely absorbed.

In the 1925 Parliament, the proposed granting of a government subsidy to a fleet of 10 vessels in order to combat the alleged monopoly of the North Atlantic Steamship Conference brought a stirring debate. The proposal was finally referred to a special committee of Parliament, which held hearings, but it was abandoned in June on the death of Sir William Peterson, with

whom the contract was to be made. Among other controversial issues were the proposed amalgamation of the Canadian Pacific and the government-owned Canadian National Railway systems, and the exportation of hydroelectric power. While the Government's position was not threatened more than usual by any of these measures, there were indications that its former support was disintegrating, and in the summer it became evident that a general election was not far off.

In September, the date of polling was announced as October 29. In the campaign, Mr. Meighen made tariff protection the leading issue, but many other questions were involved and the political situation was complex. The actual voting did not clear it up. The Conservatives obtained 116 seats; the Liberals, 101; the Progressives, 25; Labor, 2; and Independent, 1. The Prime Minister and several of his cabinet members were defeated. The ensuing situation was anomalous and unprecedented in Canadian politics. After consulting with the governor general, Mr. King decided to retain office until Parliament should meet and then to leave the question of a government to that body. When Parliament met in January, 1926, the Progressives, holding the balance of power, were divided, but enough of them rallied to the support of the Liberals to enable the latter to keep control by an always questionable margin. Mr. King was returned at a bye-election in February. On this uncertain basis, Parliament carried on until summer. It took up various foreign problems, including the diversion of Great Lakes water by Chicago, and passed a budget which provided for a number of tariff and tax reductions. Toward the close of June, however, the debate on a committee report on customs irregularities brought about what was considered a vote of censure and, on June 28, Mr. King resigned, advising the dissolution of Parliament; but the governor general, instead of following this advice, asked Mr. Meighen to form a ministry. In the face of strenuous protests that such action was unconstitutional, the new Government attempted to function, and was at first sustained by a close vote; but on July 2, it was defeated, and the governor general dissolved Parliament.

In the campaign that followed, the customs scandals and the constitutional questions played a large part. The result of the election held on September 14 was a clear victory for the Liberals, who obtained 119 seats, as against 91 for the Conservatives and small blocks of seats for other parties sympathetic with the Liberals. The new Government was thus well fortified and offered a welcome political stability to the country following many years of uncertain control. Among the constitutional changes debated intermittently over several years, the most insistent was senate reform. Critics of the Senate urged that its power over legislation should be curbed, or that its members be selected by the electorate instead of being appointed for life by the governor general, or that it should be abolished altogether. Following the Senate's action amending a number of bills in 1924, the Prime Minister promised a thorough study of the question of limiting its powers. In campaign speeches, he suggested that the veto power should be inoperative on bills which had twice passed the House of Commons. In March, 1925, the House practically directed the Government

to submit the subjects to a Provincial Conference, but such conference was not held until Nov. 3, 1927. On that date, the Dominion-Provincial Conference began a week's sessions, attended by the Prime Minister and several of the members of his cabinet, and by the Provincial Premiers. It unanimously opposed the abolition of the Senate and sentiment was also strongly against making the body elective. Only a small body of opinion favored changes which would make the Senate more responsive to the electorate.

The conference also fully discussed proposed changes in the method of amending the British North America Act of 1867, which is Canada's constitution, in order to conform to the country's increasingly independent status. In 1928 the Supreme Court handed down a decision that women were not constitutionally eligible to membership in the Senate. In the summer of 1927, the whole nation participated with enthusiasm in the celebration of the Diamond Jubilee of Confederation, marking the sixtieth anniversary of the coming together of the Provinces to form the confederation. The Prince of Wales, Prince George, and Premier Baldwin of Great Britain visited the country and, among other exercises, attended the opening of the Peace Bridge between Buffalo, N. Y., and Erie, Ont. on August 7. Vice President Dawes, Secretary of State Kellogg, Governor Smith of New York, and Premier King likewise participated in the ceremonies.

Among the matters of internal administration engaging public attention after the War, prohibition measures were conspicuous. In contrast to the United States, Canada left the whole subject of liquor-traffic regulation to the separate provinces. Of the nine provinces, Quebec remained consistently wet, Nova Scotia and Prince Edward Island adopted and retained prohibition, and New Brunswick adopted it before the War and abandoned it in favor of government control in 1927. The other five provinces passed prohibition laws during the War, Alberta, British Columbia, Manitoba, and Ontario in 1916 and Saskatchewan in 1917. Following the War, all five at one time or another gave up prohibition and replaced it with a government-control system. British Columbia declared for such a system in 1920, Alberta in 1922, Manitoba in 1923, Saskatchewan in 1924, and Ontario in 1927. The plan adopted by Ontario attracted much attention in the United States, and may be considered fairly typical of the others. It set up a Liquor Control Board whose function it was to administer the Control Act, establishing government liquor stores, supervising their operation, and prosecuting violators of the liquor law. It had a complete monopoly of the buying and selling of liquor. Liquors could be sold only to holders of permits, yearly if residents, and monthly if transients, for which a \$2 fee was charged. The sealed package containing liquor could not be opened on the premises of the government store and no liquor could be consumed there.

In the field of international and inter-imperial relations, the development of greatest moment in the post-war period was the assumption by Canada of the status of a free nation among the commonwealths within the British Empire.

It is doubtful whether the War brought Canada and the Empire closer together. While Sir Robert Borden sat at the Imperial War Cab-

inet and Canadian representatives signed the peace treaties and received seats in the League of Nations Assembly, the independent temper was revealed in the demands made in 1920 for the right to amend the Canadian Constitution without application to the British Parliament as well as for the appointment of a Canadian Minister to the United States with independent status. In 1924, when a resolution was offered in the Canadian Parliament affirming this right to amend the constitution, it was withdrawn when all parties agreed that Canada's position of equality in the Empire was so well established that no such declaration was necessary. An interesting sidelight on the earnestness with which Canadians were increasingly pressing the point was shown in the negotiations of 1923 with the United States over the signing of a convention for the preservation of the halibut fisheries in the northern Pacific. The United States, in reply to the query raised by Canada, expressed itself as willing to conclude such a convention "between the United States and Great Britain." To the surprise of the Americans, the Canadian government replied with some tartness that it desired the words "Dominion of Canada" substituted for "Great Britain" (January 16). This action precipitated a lively discussion in Canada, where, in many quarters, it was regarded as an abortive attempt on the part of the ministry to arrogate the treaty-making power. Upon the insistence of the United States Senate, whose purpose it was to include within the meaning of the treaty all British nationals, the Canadian commissioner signed the convention late in 1923 "as the duly accredited representative of the King." Other striking expressions of the Canadian spirit of independence were the declaration, by a member of the Canadian cabinet in March, 1924, that decisions of the Imperial Conference were not to be considered binding unless approved by the Canadian Parliament, and the refusal of Mackenzie King to recommend to the Parliament, in June, 1924, the ratification of the Lausanne Treaty. This last, of course, was merely a gesture, for the signing of the treaty by the British government was binding on Canada as well; but Canada declared it would in no way be bound by obligations under the treaty beyond that which the Canadian Parliament would recognize as arising out of the situation. Another indication of the new sentiment was the request made in 1921 by the Canadian Parliament, as the result of a universal demand, that the Crown desist from conferring hereditary titles on Canadian citizens. In the same year, too, the Conservative Premier, Mr. Meighen, indicated how much closer the ties were between Canada and the United States than between Canada and the Empire, by opposing the renewal of the Anglo-Japanese Treaty. In 1926 Premier Mackenzie King attended the Imperial Conference in London. Its proceedings were closely followed in the Canadian press. The general result of the conference, so far as Canada was concerned, was held to be a reaffirmation of Canada's assumed status of equality with Great Britain, although the Premier on his return declared that no attempt had been made to lay down a constitution for the empire. The report of the conference started a debate in Parliament in the course of which a resolution, asserting that declarations and recommendations of the conference should not bind Parliament without its



special approval, was voted down at the behest of the Government. Canadian nationality was further emphasized by the appointment in 1926 of Vincent Massey as Canadian Minister to Washington and by the arrival in June, 1927, of William Phillips as first United States Minister to Canada; by the election of Canada in 1927 as a non-permanent member of the League of Nations Council, Senator Raoul Dandurand acting as Canada's representative; and by the appointment of Sir William Henry Clarke as High Commissioner for Great Britain to Canada to represent that country, the governor general being considered a representative of the Crown. In September, 1928, Canada also opened a legation at Paris and announced that steps were being taken to open one at Tokyo. France and Japan in 1928 had opened legations at Ottawa. Other international events of note included the movement to open a St. Lawrence-Great Lakes Canal, proposed in the United States; the signing of agreements with the United States in 1925 for a closer restriction of the trade in narcotics and for extending the list of extraditable crimes; an extended investigation and report of a Commission on Customs and Excise on the question of smuggling between the United States and Canada, particularly of liquor; and the signing of a number of tariff and trade agreements (with Belgium, the Netherlands, Australia, and Finland in 1924 and 1925 and with Cuba in 1927).

By 1929 Canada had practically recovered from the economic losses of the War and was riding on a high tide of prosperity. The budget introduced by Mr. King on Mar. 1, 1929, provided for further reductions of taxes and maintenance of the existing tariff schedules except for a few reductions. For the fiscal year 1928-29, the debt reduction was announced as \$69,782,000.

Canadian governors general during the period were the Duke of Connaught (1911-16), the Duke of Devonshire (1916-21), Lord Byng of Vimy (1921-26), Viscount Willingdon (1926-). See separate articles on the provinces; also **BAFFIN LAND**; **EXPLORATION**; **POLAR RESEARCH**; **NAVIES OF THE WORLD**.

**CANADA, THE UNITED CHURCH OF.** A denomination formed by the union of the Congregational Churches, the Methodist Church, and the Presbyterian Church in Canada on June 10, 1925, after negotiations extending over twenty years. The Methodist Churches of Newfoundland and Bermuda also were included in the Union. The United Church of Canada has effected a consolidation of many rural congregations; the 410 self-supporting charges entering the union in 1925 were reduced to approximately one-half that number by 1928. On the other hand, 375 fields which received aid from the various home missions in 1925 had become self-supporting by 1928, under the direction of the United Church of Canada. The Board of Home Missions also opened 285 new fields, each of which included three or four places previously untouched by any denomination, thus providing the solitary church for nearly 1000 communities. Altogether in 1928, there were 1571 home-mission fields, comprising 4368 preaching places. At the third General Council, at Winnipeg, Man., in September, 1928, plans were made for an evangelical movement before the nineteenth centenary of Pentecost in 1930. The position of the denomination was indicated by the sta-

tistics for the year ending Dec. 31, 1927: 11 Conferences; 115 Presbyteries; 637,750 communicants; an increase of 37,228 since Mar. 31, 1926; 395,724 families under pastoral care; and with the addition of about 300 new Sunday schools during 1927, there were 619,570 pupils at the end of the year.

**CANALS.** While the great ship canals in all parts of the world, Suez, Panama, Welland, and the Sault Ste. Marie, continued to show their great economic value, the inland canal problem appears to have reached a totally different status in America and abroad. Apparently, differences in economic conditions and demands have made the inland canal in most cases a thing of the past in America, whereas differences in the same factors make it an important means of transportation on the European Continent. See **PANAMA CANAL**; **SUEZ CANAL**.

The outstanding canal construction in the United States in recent years undoubtedly has been the New York State Barge Canal completed in 1917 at a cost of about 175 million dollars. It furnishes a striking example of the economics of American inland canal transportation. For this great work, an excellent piece of design from the technical standpoint, is probably the greatest economic failure in the history of the world. Built on what has proved to be an absolutely fallacious and incorrect analysis of the engineering economics involved, if indeed any analysis worthy of the name was made, it costs the people of New York \$7,000,000 a year in interest and maintenance charges and carries less than 10 per cent of the traffic for which it was designed.

In spite of the inherent defects of the inland canal as a means of transportation in America, the slowness of canal traffic, the fact that in northern latitudes canals are frozen over for a considerable period each year, and that, although the cost per ton-mile of transport may be low, the cost of handling freight by canal must include the cost of loading and unloading, of transporting from source to terminal and terminal to destination, much of which is eliminated by the modern railroad with its rapid movement of freight from door to door by means of industrial tracks and sidings—in spite of all these items, there was neither enough local freight to justify the construction of this canal nor hope of securing enough through freight to make it worth while. It was expected that the people of New York State by popular vote had solved the problem of the economic *raison d'être* for this great work, when, like Kipling's village which voted the world was flat, they voted to build the Canal. Attempts have been made to get the Federal government to take over the Barge Canal and make it into a Great Lakes-Atlantic waterway, but it still remains a liability on New York State.

As a matter of fact, fully three-quarters of the canals built in the United States have been abandoned for reasons similar to those stated above, whereas European conditions still encourage the maintenance and construction of canal works. It is believed that the fundamental difference is due not only to the willingness of business in Europe to use slower means of transportation than the railroad, but also to the fact that labor is cheap and therefore handling, that is, loading and unloading or transferring, is inexpensive, and thus the unquestionably lower cost of water transportation is not

wiped out by the cost of getting freight to or from the canal system.

At the present time, there seems to be little hope of a general inland canal revival in America, at least one based on sound economic grounds, although millions have been spent on inland waterways and enthusiastic supporters of the canal idea continue to agitate for further expenditures. In certain cases, American canal constructions, although not encouraged by any immediate hopes of great traffic, are going forward. Principal of these are the Illinois & Ohio Waterways and the Inland Waterways system of the Atlantic coast. The outstanding work on the American continent at the present time is undoubtedly the Welland Canal in Canada, the completion of which is awaited with great interest.

**Cape Cod Canal.** The Cape Cod Canal which had been under construction for a number of years was formally opened on Aug. 1, 1914, and established direct connection between Buzzard's Bay on the south and Cape Cod Bay on the north. It shortened the distance between Vineyard Sound and Boston by about 70 miles, and eliminated considerable danger due to hidden reefs and banks along the coast of the Cape, not to mention fogs which are often prevalent in this region. The canal is a sea-level canal without locks and practically a straight line with a single curve. It is lighted by electricity at night and is crossed by railway and highway bridges which give a width of 150 feet in the clear between the piers. For the greater part of its length, the canal has a bottom width of 100 feet and a depth of 25 feet at mean low water. At three points, the bottom width is increased to 250 feet, so as to make passing points for vessels, while in the approach channels, a width of 250 to 350 feet is maintained to deep water at both ends of the canal.

A massive breakwater, 3000 feet in length to the shore line, protects the entrance to the canal from being filled in by the action of the waves in addition to forming a shallow harbor for shipping. The excavation of the canal for the most part was done by hydraulic dredges. By 1915 the canal was made passable for large steamers and deep-draft barges. After the World War, it was proposed that the United States government should acquire the Cape Cod Canal, and in 1921 Secretaries Weeks, Denby, and Hoover made an investigation and recommended that the Federal government should acquire the control of the canal at a price of \$11,500,000 for which sum the Boston, Cape Cod & New York Canal Co. was willing to sell. The deal was authorized in 1927, but was not finally closed until 1928 when the canal was taken over by the Government and will be operated as a toll-free national waterway.

**Chesapeake and Delaware Canal.** This canal, about 15 miles in length, extending from Delaware City, on the Delaware River, to Chesapeake City, Maryland, on a stream flowing into Chesapeake Bay, was formally taken over by the Government, the event being officially celebrated at Delaware City on Oct. 11, 1919. This canal was chartered in 1799, but was acquired by the National government under an appropriation of \$2,514,290 by Congress, with an additional item of \$500,000 for deepening and widening. The improvement involved making this waterway a sea-level canal which would require an increased excavation of 10 feet for a considerable distance

at the summit level. This did away with the three locks, constructed in 1830 with a width of 24 feet and a length of 220 feet, which had served to restrict navigation. The summit level of these locks was 15 feet above mean low tide, while the mean ranges of tide at Delaware City and Chesapeake City were respectively 6 feet and 2 feet. The project adopted for the improvement provided for a lockless tide-level canal 12 feet deep and 90 feet wide on the bottom, estimated to cost \$12,000,000. This canal when enlarged will form part of an inland waterway from Philadelphia to Norfolk and thus part of the plan, being gradually constructed, for an inland waterway along the northern Atlantic coast. Proponents of this scheme argue for it on the ground of use by small shipping and for national defense.

**Ohio River Canalization.** The improvement of the Ohio River for navigation with the plan of providing a minimum depth of 9 feet for its entire length of 968 miles is being continued by the Corps of Engineers of the United States Army. Two fixed and 48 movable dams with navigation locks generally 110 x 600 feet in size at each dam, are involved. The total cost of the work is estimated at \$105,000,000 and it is of great technical interest because of the various types of movable dams involved. These include Chanoine wickets and other devices not common in American practice.

**Lake Washington Ship Canal.** A waterway which couples Lake Washington with Seattle on Puget Sound, on the North Pacific coast, was opened in 1917. Formed in large part by dredged channel, this canal, a total of some 8 miles in length, permits ships in the Alaska and coast trade to be raised some 25 feet for storage to a fresh-water harbor of 250,000 acres free from troublesome marine borers and rapid salt-water deterioration. The depth of the canal is 28 feet and special precautions have to be observed to prevent the salt water from "climbing" through the locks to the lake. See also SAULT STE MARIE, CANALS AT.

**Welland Canal.** Probably the most important canal work in the new world now in progress and nearing completion, is the Welland Ship Canal which will join lakes Erie and Ontario. Although this work was started in 1913, construction was held up due to the Great War, but was resumed later and the contract for the last section was let in 1925. It is expected that the work will be completed in 1930. Seven locks, among the largest in the world, will replace the numerous small locks of the present canal. An unfortunate accident in August, 1928, wrecked one of the huge canal gates—a mitring leaf 82½ feet high was overturned by a falling crane—but the Canadian government is carrying the work forward as rapidly as possible. In 1929 the lock at the Port Colbourne end of the canal, 1380 feet long and with a depth of 30 feet of water was opened for operation in connection with the old canal.

The Welland Canal will permit lake shipping to reach ports on Lake Ontario and will doubtless have an important effect on traffic routes between the Great Lakes and the Atlantic seaboard. There are, of course, two possibilities. Either the St. Lawrence of the Great Lakes-Hudson ship canal may be built or ports may be established on Lake Ontario, superseding to a considerable extent the Lake Erie ports, for transshipment from lake steamers to railroads.

The St. Lawrence project is still tied up in international difficulties and the Great Lakes-Hudson Canal, because of physical and operating difficulties, as well as the New York Barge Canal failure, also seems rather remote. The Canadian government has, therefore, already selected Prescott, Ontario, a town well along the St. Lawrence below the eastern end of Lake Ontario, as a site for a new port. On the United States side, no official action is, of course, possible, but Oswego would naturally hope to profit by such extension of the Great Lakes steamship lines into Lake Ontario as may occur.

**Chicago Drainage and Illinois Canals.** Although the Chicago Drainage Canal was built primarily to enable Chicago to discharge her drainage into the upper Mississippi Valley instead of Lake Michigan, her source of water supply, it will become in the near future a connecting link in a waterway from the Great Lakes to the Mississippi. This will be made possible through the construction of a connecting Illinois waterway, 63 miles long from the Drainage Canal at Lockport to the Illinois River at Starved Rock. It is expected that the work will be completed by 1930. The Canal will be 200 feet wide with a 9-ft. depth of water and will require five locks 110 x 600 feet. Provision also has been made by Congress for a 9-ft. depth in the Illinois River from Starved Rock to the Mississippi. In the meantime, the whole Chicago drainage and water-supply problem is still under discussion. Thirteen states have been acting together in an attempt to secure a ruling from the United States Supreme Court which will prevent the diversion of water at Chicago for sewerage purposes. See WATER SUPPLY.

**The Murray River Works, Australia.** Rapid progress is being made on these great navigation and irrigation works in the south-east corner of Australia. The Murray River, with its principal branch, the Darling, empties into the sea near Adelaide in South Australia, and this state has long been interested in improving it for navigation. On the other hand, New South Wales and Victoria, in whose territory it rises, were interested primarily in irrigation development. South Australia began works in 1911, after ineffective attempts to secure cooperation with her sister states. The Act of 1915, however, brought about an effective scheme for concerted action between the Commonwealth of Australia and the three states and work has since gone forward on a project which has been changed more or less from time to time but which involves an expenditure of some 35 or 40 million dollars. The most important works are the two dams forming storage reservoirs at Lake Victoria on the lower, and at Mitta Mitta on the upper, Murray, a stream which is in some years navigable at all times for as much as 1100 miles from its mouth, while in other years it dries up in part and may be navigable for only one month. The work will be completed in the near future.

**German Internal Waterways.** In Continental Europe, the various systems of canals which had been rather highly developed found advantageous use during the World War. A notable instance was the River Main which was rendered navigable for vessels up to 1200 tons, and was employed as an internal route for general commerce and war supplies, particularly timber. The canalization of this river involved the construction of dams provided with ship

sluices, so that it was possible to navigate with larger vessels than previously. A notable dam of this type was built at Mainkur; it included a roller weir, a power plant, and a raft chute 300 meters long and 12 meters wide, together with two side openings, each 30.6 meters wide, and a ship passage 40 meters wide.

The power plants at this dam were put in operation in 1921, but the sluices were completed and ready for use in 1917. The canalization of the Main was to extend from Frankfort to Werenfeld, and it was proposed to add open canal construction between Werenfeld and Schweinfurt, while from Schweinfurt to Bamberg, it would be impossible to canalize the river.

There also was set on foot an important waterway involving the canalization of the Neckar through Baden and Württemberg from Mannheim to Plochingen, using the river bed for large-vessel traffic. The plan involved also special canalization from Plochingen to Ulm and from Ulm to Ravensburg and Friedrichshafen in order to supply the states of Baden and Württemberg with coal and other facilities. Such a canal system naturally involved a large number of locks, some of them of considerable height, and the development of river basins.

As a result of this development, the Neckar would be made a navigable waterway for all seasons of the year, for barges of 1200 tons, completely loaded, and the traffic which before the War amounted to 400,000 tons per year would naturally reach much larger figures with the improved waterway, being estimated by some at as much as, or in excess of, 5,000,000 tons. The various power plants situated on the banks of the river between Mannheim and Plochingen before the War represented an output of 15,000 horse power, but with the completion of the works undertaken would develop some 63,000 horse power.

The beginning of these German canal works was made during the War, but at the close of hostilities comparatively little was done for a while except to afford labor to the unemployed. Work was begun again on a large scale during the autumn of 1921 and the construction of the bridges and dams also was started, but in 1923 the increase of costs led to the slowing down of the project.

At the present time, three other important works are under way. The Rhine-Danube Canal is practically finished and in large part open to traffic. It is expected that the so-called Midland Canal, joining the Rhenanian-Westphalian industrial district with central Germany, will be completely in service by 1930. The Hanskanal, from the Ruhr to Hamburg, also is under construction but will not be finished for some eight years.

**Marseilles-Rhone Canal.** A notable European canal project executed during the period of the World War was the Marseilles-Rhone Canal involving an artificial waterway 51 miles in length and extending from the Rhone River at Arles to the Bay of Marseilles. This canal was also notable in that it included a tunnel four and a half miles in length which pierces the mountain ridge north of the city and affords direct access to the harbor. A typical section of this tunnel is a square invert 59 feet wide and 15 feet deep with an approximately semi-circular arch of 41 feet radius, affording an excavated section 79 feet wide and 50 feet high. (See TUNNELS.) In addition to the tunnel,

there was involved a breakwater construction between Marseilles and Port de Bone, and in the Étang de Berre. At Arles, where the canal had access to the Rhone, a system of locks was built.

**CANBERRA.** The capitol of Australia dedicated May 9, 1927. See AUSTRALIA.

**CANBY, HENRY SEIDEL** (1878- ). An American professor and editor (see VOL. IV). In 1916, he became advisor in literary composition with professorial rank at Yale University. He resigned as assistant editor of the *Yale Review* in 1920, becoming editor of the *Literary Review of the New York Evening Post*, 1920-24, and of the *Saturday Review of Literature* after 1924. In 1918 he was on liaison work in England, Ireland, and France for the British Ministry of Information. His works include: *College Sons and College Fathers* (1915); *Facts, Thought and Imagination* (in collaboration, 1917); *Good English* (in collaboration, 1918); *Education by Violence* (1919); *Our House* (1919); *Everyday Americans* (1920); *Saturday Papers: Essays on Literature from the Literary Review* (1921); and *Definitions: Essays in Contemporary Criticism* (1922); *Definitions*, second series (1924); *Better Writing* (1926). He is coeditor of: *Selections from John Masefield* (1917), *War Aims and Peace Ideals* (1919), *Anihome and Cleopatra* (1921), and editor of Stevenson's *Master of Ballantrae* (1922).

**CANCER.** Despite all organized effort to warn the public of the urgent need of early recognition and treatment of cancer, the mortality from the disease since 1914-28 has been apparently on the increase. The expression "apparently" is used because of the ease with which statistics can be assailed. There is some evidence to show that cancer was not increasing, although none which shows any diminution. Granted that the death rate is a constant, improvements in diagnosis and increasing average duration of life, which result from modern sanitation, would still convey the illusion of an annual increase. If every death were followed by a skilled autopsy, the number of cancer deaths could be made to show an increase which would not be due to spread of the disease. The campaign of education conducted by the Association for Cancer Control cannot prevail against the innate fear of an examination, the fear of an unfavorable diagnosis, and the fear of operation.

An increasing number of surgeons show pessimism, as in the statement by one that early operations can cure cancer although the diagnosis must be made at a stage in which successful diagnosis is seldom practicable. The favorable percentages obtained by surgeons of unusual attainments and experience operating under ideal conditions appear to show that early intervention can conquer the disease; but the average patient will be operated on by the local surgeon and under less favorable conditions.

What has been said of the knife applies with the same force to radium and X-ray therapy. Under the most favorable auspices, individual operators obtain excellent results, but this does not benefit the average cancer victim. The alleged discovery of the causation of cancer by Gye and Barnard, although vouched for by high authority, has borne no fruit. More promising is the Blair Bell lead treatment as an accessory to X-ray therapy, for this not only has a solid theoretical foundation but it seems in trained hands to give dependable results. But

not only is it so hazardous that it can be carried out only in hospitals under skilled supervision; its results in the hands of some who have tested it have been very disappointing. For some years, evidence has been accumulating that cancer is a disease caused or favored by a high alkaline index of the blood and tissues. Dr. E. McDonald of the University of Pennsylvania Cancer Institute recently told the American Chemical Society Institute that alkalinity is the decisive factor in cancer genesis. This should give leads for a rational treatment, but thus far no plan has been developed.

The enormous economic wastage of cancer has been recently computed by actuaries as eight hundred million dollars annually for the United States alone. This loss, if it involved property and not life, would call forth vast engineering efforts which are not even foreshadowed today.

**CANDLE POWER.** See ELECTRIC LIGHTING.

**CANFIELD, DOROTHY.** See FISHER, DOROTHY CANFIELD.

**CANNAN, EDWIN** (1861- ). An English economist (see VOL. IV). He became professor emeritus of political economy in the University of London in 1926. His later works include *Money* (1918, 5th ed., 1926); *Coal Nationalization* (1919); *The Paper Pound of 1797-1821* (1920); and *An Economist's Protest* (1927).

**CANNAN, GILBERT** (1884- ). An English novelist and dramatist. He was educated at Cambridge and was a dramatic critic on *The Star* in 1909-10. Among his books are *The Anatomy of Society* (1919); *Time and Eternity* (1920); *Pigs and Peacocks* (1921); *Old Maid's Love* (1922); *Letters from a Distance* (1923); *The House of Prophecy* (1924); and the play, *The Release of the Soul* (1920).

**CANNING.** See BOTULISM.

**CANNON.** See ARTILLERY; ORDNANCE.

**CANNON, JAMES, JR.** (1864- ). A bishop of the Methodist Episcopal Church, South, born at Salisbury, Md., and educated at Randolph-Macon College, Princeton University, and Princeton Theological Seminary. Having been ordained to the ministry in 1888, he was named to different pastorates in Virginia. From 1894 to 1911, he was principal of the Blackstone Female Institute, and from 1914 to 1918, principal of the Blackstone College for Girls. In 1918, he became a bishop. In 1920-24 he headed a commission of the Federal Council of Churches on Relation with the Religious Bodies of Europe. He was chairman of the national legislative committee of the Anti-Saloon League and of the Board of Temperance and Social Service, M. E. Church, South, after 1914. Since 1919 he has been chairman of the executive committee of the World League against Alcoholism. In the presidential campaign of 1924, he took an active part in behalf of prohibition and in 1928 was a leader of the Southern Democrats who voted the Republican ticket because of the anti-prohibition stand taken by Alfred E. Smith, the Democratic presidential candidate.

**CANNON, JOSEPH GURNEY** (1836-1926). An American lawyer and Congressman (see VOL. IV). He retired from Congress on Mar. 4, 1923, after serving for 46 years, during which he was four times Speaker of the House of Representatives. In 1927 appeared *Uncle Joe Cannon: the Story of a Pioneer American as Told to L. White Basbey*.

**CANNON, WALTER BRADFORD** (1871- ). An American physiologist, born at Prairie du Chien, Wis., and educated at Harvard (A.B., 1896; M.D., 1900). In 1906 he was made George Higginson professor of physiology at Harvard. His works include *Laboratory Course in Physiology* (1911); *Bodily Changes in Pain, Hunger, Fear, etc.*; and *Traumatic Shock* (1923). He was one of the editors of the periodical *Psychobiology* (1919-20). He made many contributions to physiological periodical literature, was Croonian lecturer before the Royal Society, London, 1918, and was president of the Medical Research Society of the American Red Cross in France, 1917-18. He received American and British decorations for his services in the World War.

**CANTERBURY, ARCHBISHOP OF.** See **LANG, COSMO GORDON.**

**CANTIGNY.** See **WAR IN EUROPE.**

**CANTWELL, JOHN JOSEPH** (1874- ). A Roman Catholic bishop, born in Limerick, Ireland, and educated at the colleges of the Sacred Heart and Saint Patrick, Ireland. He was ordained to the Roman Catholic priesthood in 1899, and from that date until 1904 was curate in Berkeley, Calif. For the following 10 years, he was secretary to the Archbishop of San Francisco, and from 1914 to 1917, vicar general of the same diocese. He was made Bishop of Monterey and Los Angeles in 1917.

**CAPE COD CANAL.** See **CANALS.**

**CAPE OF GOOD HOPE, PROVINCE OF THE.** See **SOUTH AFRICA, UNION OF.**

**CAPEK, JOSEF.** See **CAPEK, KAREL.**

**CAPEK, KĀ'pĕk', KAREL** (1890- ). A Czech journalist and playwright who was born at Malé Svatonovice and educated at the universities of Prague, Berlin, and Paris. While still a student, he and his brother JOSEPH (1888- ), an artist as well as a writer, collaborated on short stories collected as *Giant's Garden* and *Radiant Depths*. Karel was art director of the national theatre in Prague, but soon established his own theatre, the Vinohrady, where he produced the dramas of Shakespeare, Byron, Molière, Ibsen, Strindberg, Goethe, Hauptmann, and Czech authors, and gave Shelley's *Cenci* its world première. He also wrote plays which included *The Robber* (1918); *R.U.R.*, a satiric melodrama (1920), and *The World We Live In* (1921), written with his brother Joseph, an arraignment of human life, known as the "insect play," because its characters were insects; *Macropulos Affair* (1922); *The Creators*, with his brother Joseph (1926); and *The Macropulos Secret* (1927). *R.U.R.* and *The World We Live In* were successfully presented in New York in 1922-23, and *The Macropulos Secret* in 1927. He also wrote *Crossways*, short stories; *Pragmatism; Criticism of Words; Painful Stories; Manufacturing of the Absolute*, a novel (1922); *Italian Letters; Krakatit*, a novel; *How a Theatre-Play is Made*, with his brother (1925); *English Letters* (1925); *About the Nearest Things* (1926); *The Absolute at Large* (1926); and *How a Play is Produced* (1928).

**CAPEN, EDWARD WARREN** (1870- ). An American sociologist (see VOL. IV). He was again Thompson Lecturer on Missions at the Hartford Theological Seminary in 1914, 1917, and 1918. He identified himself with the Kennedy School of Missions as secretary, instructor in sociology, and associate professor (1914 to

1917), becoming in 1917 full professor, and in 1919, dean. He was appointed assistant recording secretary of the American Board of Commissioners for Foreign Missions in 1915. In 1919-20 he was chairman of the training school section of the Religious Education Association, and from 1920 to 1922, chairman of the Association of Institutions Engaged in Missionary Training. He edited *Preparation for Missionary Work in Japan* (1915), and *Preparation for Presenting Christianity to the Hindus* (1917). He wrote *The History of Connecticut Institutions* (1925).

**CAPERS, WILLIAM THEODOTUS** (1867- ). A Protestant Episcopal bishop, born at Greenville, S. C., and educated at South Carolina College, Furman University, and the Theological Seminary of Virginia. He was rector in churches in N. Carolina and S. Carolina and in Mississippi from 1895 to 1905 and dean of Christ Church Cathedral, Lexington, Ky. (1905-12). From 1913 to 1916, he was bishop coadjutor in the diocese of West Texas. In 1916 he was made bishop of that diocese.

**CAPITAL SHIP.** See **VESSEL, NAVAL.**

**CAPORETTO.** See **WAR IN EUROPE.**

**CAPPER, ARTHUR** (1865- ). A United States Senator and publisher, who was born at Garnett, Kan., and graduated at the local high school. He began as a compositor on the Topeka *Daily Capital* and was successively reporter, city editor, and Washington correspondent of that newspaper, of which he has been publisher and proprietor since 1892. He also published *Capper's Weekly, Farmers' Mail and Breeze, Household Magazine, Capper's Farmer, Missouri Ruralist, Ohio Farmer, Michigan Farmer, and Pennsylvania Farmer*. He served as president of the Board of Regents of the Kansas Agricultural College, was Governor of Kansas (1915-19), and was elected United States Senator for the terms 1919-31. In the Senate, he gave particular attention to farm-relief legislation.

**CAPPON, JAMES** (1854- ). A professor emeritus of English, and dean of the Arts Faculty at Queen's University, Canada (see VOL. IV). He is the author of various pamphlets, especially a series on the War: *What the Present War Means, German Politics and British Politics, Democracy and Monarchy in the Modern State, The Scandinavian Nations and the War, Bourgeois and Bolshevik, and A School of Idealism*.

**CAPPS, CHARLES R.** (1871- ). An American railway official, born in Norfolk, Va. He was educated at Roanoke College and began his railway career with the Seaboard & Roanoke Railway. He acted in important capacities with several railroads in the South, and in 1915 was appointed first vice president of the Seaboard Air Line. He was president of the Marion Southern Railway and was director and vice president of many other roads in the South.

**CAPPS, EDWARD** (1860- ). An American philologist (see VOL. IV). He has been professor of Greek language and literature at the universities of Chicago and Princeton and lecturer at Johns Hopkins (1917). He was American Red Cross Commissioner to Greece, 1918-19, and Envoy Extraordinary and Minister Plenipotentiary, 1920-21.

**CAPPS, WASHINGTON LEE** (1864- ). An American naval officer (see VOL. IV). He was president of the Navy Compensation Board and general manager of the Emergency Fleet Corporation in 1917. He was awarded the Navy



Distinguished Medal for his work during the World War. He became president of the Naval War Claims Board in 1925.

**CARAWAY, THADDEUS H.** (1871- ). A United States Senator, born in Stoddard County, Mo., who was graduated at Dixon College, Tenn. (1896). He was elected to Congress in 1913 as a Democrat from the First Arkansas District and continued there until 1921, when he was chosen U. S. Senator. He was reelected in 1926 for the term expiring in 1933. In the pre-nomination Presidential campaign of 1928, he opposed the candidacy of Alfred E. Smith, but supported him for election as the Democratic nominee.

**CARBON, CARBON COMPOUNDS.** See CHEMISTRY.

**CARBON BLACK.** See NATURAL GAS.

**CARBURETOR.** See MOTOR VEHICLES.

**CARCHEMISH.** See ARCHÆOLOGY.

**CARCO, kar-kō, FRANCIS** (1886- ). A French author, born at Nouméa, New Caledonia, whose real name was Carcopino. He was a poet, belonging to the *Fantaisiste* school, a novelist, a dramatist, and art critic for *L'Homme libre* and *Gil Blas*. During the World War, he was an aviation pilot at Étampes. His works were picturesque, painting Montmartre and being written in the *argot* of Paris. He has been called the "*romancier des apaches*." His writings include: *Instincts* (1911); *La bohème et mon cœur*, poems (1912); *Jésus-la-caille* (1914); *Les Innocents* (1916); *Au coin des rues*, tales, (1916, 1918, 1922); *Les Malheurs de Fernande*, sequel to *Jésus-la-caille* (1918); *L'équipe* (1919); *La Poésie* (1919); *Petits airs*, poems (1920); *Francis Carco, raconté par lui-même* (1921); *Mon homme*, a play with André Picard (1921); *L'homme traqué*, awarded the Grand Prix du Roman by the French Academy (1922, tr. 1924); *Promenades pittoresques à Montmartre* (1922); *Véroschka l'étrangère*, sharply criticized by the French reviews, as the author seems out of his element (1923); *Rien qu'une femme* (1924); *Le roman de François Villon* (1926); *De Montmartre au quartier latin* (1927), as *The Last Bohemian* (1928); *Rue Pigalle* (1928), and *La légende et la vie d'Utrillo* (1928).

**CARCOPINO, F.** See CARCO, FRANCIS.

**CARDOZO, BENJAMIN NATHAN** (1870- ). An American jurist, Chief Judge of the New York Court of Appeals. He was born in New York City, graduated from Columbia College in 1889, and was admitted to the bar two years later. Becoming a justice of the Supreme Court of New York in 1914, he was designated to serve as a judge of the Court of Appeals and was elected for a full term on that bench in 1917. In 1926 he became Chief Judge. He is the author of *Jurisdiction of the New York Court of Appeals* (1909), *Growth of the Law* (1924), *Nature of the Judicial Process* (1925), and *Paradoxes of Legal Science* (1928). He received the degree of doctor of laws from Columbia, Yale, New York University, University of Michigan, and Harvard.

**CARINTHIA.** A province of the Republic of Austria. Its area in 1910 was 3987 square miles; in 1923, 3680 square miles. Its population in 1910 was 396,200; in 1923, 370,817. See AUSTRIAN REPUBLIC.

**CARLETON COLLEGE.** A coeducational institution at Northfield, Minn., founded in 1866; maintaining relations of cooperation with the Congregational, Baptist, and Protestant Epis-

copal churches of the State, and with an enrollment limited since 1920 to about 800 students. The faculty included 73 teachers in 1928, and about 25 administrative officers. The endowment funds in 1928 amounted to about \$2,500,000 and the plant was valued at approximately \$3,590,000; the annual budget for educational purposes for 1928-29 was estimated at \$580,000, exclusive of expenses of dormitories, dining halls, and other service properties, amounting to about \$450,000, bringing the total operating budget up to about \$1,000,000. President, Donald John Cowling, Ph.D., LL.D.

**CARLSEN, EMIL** (1853- ). An American landscape and marine painter (see VOL. IV). He received the Inness Gold Medal in 1907, the Gold Medal of Honor of the Panama-Pacific Exposition at San Francisco in 1915, the Jennie Seshan Gold Medal of the Pennsylvania Academy of Fine Arts (1916), the Saltus Gold Medal of the National Academy of Design (1916), the Carnegie Prize in 1919, and the Gold Medal of the Sesquicentennial Exposition at Philadelphia in 1926.

**CARLSON, JOHN FABIAN** (1875- ). An American landscape painter, born in Smaland, Sweden, who came to the United States in 1886. He studied art at the Art Students' League in New York and in Buffalo, and became head instructor of landscape painting at the Art Students' League School, Woodstock, N. Y. Carlson has been known particularly for his wonderfully toned and richly beautiful winter themes. His canvases are distinguished by the quality of light which invariably envelops and irradiates the scene, integrating all its rich colors in one full-toned harmony. In 1911 he was elected an Associate of the National Academy, and in 1923 he received the Ranger Fund Purchase Prize of the National Academy. He is well represented in the Corcoran Gallery, Washington, the museums at Toledo, Ohio, Youngstown, Pa., and in other public collections. He founded a School of Landscape Painting at Woodstock in 1923.

**CARLTON, NEWCOMB** (1860- ). An American engineer and business man, born at Elizabeth, N. J., and educated at Stevens Institute. From 1891 to 1919, he practiced as a mechanical engineer in Buffalo, N. Y., and was subsequently director of works of the Pan-American Exposition for three years. He was then connected with the Bell Telephone Company and the Westinghouse Electric & Manufacturing Co. until the year 1910, when he became vice president of the Western Union Telegraph Company. He was made president of this company in 1914.

**CARMEN, (WILLIAM) BLISS** (1861-1929). An American poet (see VOL. IV). His later works include: *Earth Deities* (with Mary Perry King, 1914); a translation of C. A. Debussy's *Album of Six Songs* (1915); *Open Letter* (1920); *Later Poems* (with an appreciation by R. H. Hathaway, 1921-1922); *Far Horizons* (1925).

**CARNARVON, kār-nār'vōn. GEORGE EDWARD STANHOPE MOLYNEUX HERBERT, EARL OF** (1866-1923). A British peer, and co-discoverer of the tomb of Tutankhamen in Egypt. He was born June 26, 1866, and was educated at Eton and Trinity College, Cambridge. His interest in Egyptology was aroused by the collections of illuminated books and manuscripts which he had gathered, and in 1906 he applied for permission to excavate at Thebes. As he had obtained

the assistance of Howard Carter, former inspector in the service of antiquities at Thebes, the permission was granted and the two undertook a series of excavations mostly on the northern side of Assassif Valley near the Temple of Derel Bahri. In 1908 they discovered the tomb of a prince of the Eighteenth Dynasty, containing precious caskets and a gaming board. In succeeding years, tombs were systematically discovered and cleared. Meanwhile, Lord Carnarvon, with his family, took up his residence in the Valley of the Kings and worked on an account of the excavation, which appeared in 1912 under the title of *Five Years' Exploration at Thebes*. After the World War, he received a concession in the Valley of the Kings, and with Mr. Carter undertook to excavate down to bed rock. In November, 1922, after long labors, they uncovered the wall which finally pointed to the tomb of Tutankhamen. On Apr. 5, 1923, as the result of an insect bite, Lord Carnarvon died at Cairo. See TUTANKHAMEN; ARCHAEOLOGY.

**CARNEGIE CORPORATION OF NEW YORK.** An organization founded by Andrew Carnegie and chartered under the laws of the State of New York in 1911, to promote "the advancement and diffusion of knowledge and understanding among the people of the United States." The Corporation was originally endowed at \$125,000,000, the amount to be increased upon the final settlement of Mr. Carnegie's estate. Although the income of the endowment fund is applicable only within the United States, the Corporation holds a special fund of \$10,000,000, the income of which may be devoted to projects in Canada and the British colonies. The activities of the Carnegie Corporation are limited to financial cooperation with existing institutions and associations, and although it is an educational foundation, it is not an operating agency.

The outstanding features of the programme of the corporation are concerned with library service, the place of arts in American life, adult education, scientific research, and educational studies. In 1924-25 a sum of \$5,000,000 to be distributed over a period of five years was given to the Carnegie Institution of Washington to augment its endowment, and \$100,000 was set aside to be used for the purchase of teaching equipment for departments of fine arts in colleges and universities throughout the United States; four endowment grants of \$50,000 each were given for the support of fine arts departments in colleges; and a number of grants were made for the development and support of college libraries and library-school activities. Research activities in pyorrhea; production and purification of insulin; investigations of osteosclerosis; and the studies conducted by the Society for the Promotion of Engineering Education and the Modern Language Association, all received support over a period of years. The Trustees in 1929 were: James Bertram, Nicholas Murray Butler, Louise M. Carnegie, John J. Carty, Samuel Harden Church, Robert A. Franks, William J. Holland, Henry James, Frederick P. Koppel, Russell C. Leffingwell, John C. Merriam, John A. Poynton, Henry S. Pritchett, and Elihu Root.

**CARNEGIE FOUNDATION FOR THE ADVANCEMENT OF TEACHING, THE.** A foundation established by Andrew Carnegie on Apr. 16, 1905, when he placed an endowment

of \$10,000,000 in the hands of 25 trustees, mostly presidents of universities and colleges, for the purpose of encouraging higher education in the United States, Canada, and Newfoundland, chiefly by providing retiring allowances for teachers in universities and colleges and pensions for their widows. The foundation was incorporated by Act of Congress in 1906. Its resources were increased by a further gift of \$5,000,000 from Mr. Carnegie in 1908, and by appropriations of \$1,250,000 in 1913, and \$12,000,000 in 1918 from the Carnegie Corporation, which Mr. Carnegie established in 1911. At the completion of its twenty-third year in 1928, the foundation had endowments and accumulated reserves amounting to \$31,527,000, and had distributed \$17,372,000 in retiring allowances and pensions to 1000 teachers and 500 widows, chiefly through 72 associated institutions, selected because of their educational excellence. The foundation publishes extensive annual reports, which deal with many educational problems. Its Division of Educational Enquiry, established in 1913, has issued a score of comprehensive bulletins, dealing with medical, legal, engineering, dental, and vocational education, the training of teachers, intercollegiate athletics, and kindred subjects. Dr. Henry Smith Pritchett is president and Clyde Furst, secretary. The headquarters are at 522 Fifth Avenue, New York. See UNIVERSITIES AND COLLEGES.

**CARNEGIE INSTITUTE OF TECHNOLOGY.** A non-sectarian institution for technical education at Schenley Park, Pittsburgh, Pa., founded in 1900 by Andrew Carnegie. The student enrollment increased from 3285 in 1914 to 6039 in the autumn of 1928, and from 628 in the summer session of 1923, to 735 in 1928; the faculty from 202 to 355 members. The productive funds in 1924 were \$8,000,000; in 1928, \$15,900,000; and the income in 1928 was \$794,000, exclusive of student fees. The institute has a campus branch of the Carnegie Library of Pittsburgh, which has 450,000 volumes. In 1922 the Institute received 13 pledges of \$10,000 each, to be paid in annual amounts of \$1,000, bringing the total amount pledged up to \$130,000, for the purchase of paintings for Carnegie Institute of Technology. This amount was in turn met with an offer from the Carnegie Corporation of New York to match these subscriptions dollar for dollar up to the total sum of \$150,000. In 1925 the Carnegie Corporation of New York paid to the Board of Trustees of the Carnegie Institute, the sum of \$8,000,000 as an endowment for the Institute of Technology, and at the same time offered another sum of \$8,000,000, payable in 1946, provided the Trustees in the meantime collect a sum of \$4,000,000, constituting a further endowment of \$12,000,000. President, Thomas Stockham Baker, Ph.D., LL.D.

**CARNEGIE INSTITUTION OF WASHINGTON.** An institution established in 1902 for the purpose of encouraging research and investigation and the application of knowledge to the improvement of mankind. In 1921 it was announced that important new discoveries had been made by Dr. A. A. Michelson, of the Mt. Wilson Observatory, that furnished a new starting point for further investigations concerning the nature of the universe. By use of the interferometer, the dimensions of Betelgeuse in Orion and many other stars were measured, and the way was opened for corresponding observations on a group of stars theretofore seemingly en-

tirely out of range. The large ruling machine, for many years under construction, was successfully operated in the preparation of diffraction gratings.

At the Mount Wilson Observatory, further important work was accomplished in 1926, including Dr. King's classification of spectral lines; Henry Norris Russell's complete analysis of a complex spectrum; Mr. Pettit's measurements of ultra-violet solar radiation; Dr. Michelson's measurement of the velocity of light with improved instruments; Dr. Hubble's contribution to the knowledge of the universe of spiral nebulae; and observations of the sun made possible by the spectrohelioscope designed by Dr. Hale.

The department of terrestrial magnetism has been engaged in making a magnetic survey of the earth. Its investigations included the phenomena of magnetism, electricity, and gravitation. The non-magnetic ship, *Carnegie*, made a number of voyages in the Atlantic, Pacific, and Indian oceans, and in 1916 sailed around the Antarctic ice pack in 118 days. This sea survey, begun in 1909, in which the *Carnegie* traveled 300,000 miles, was completed in 1921, and the regions visited were charted.

The *Carnegie* sailed on its seventh cruise, May 1, 1928, with improved apparatus and a more experienced staff, to extend the previous observations to the correlated aspects of physical oceanography. The department of terrestrial magnetism also maintained two permanent recording stations at Huancayo, Peru, and at Watheroo in southwestern Australia, nearly opposite sides of the earth, to investigate the relation of electric currents in the earth and the earth's magnetic changes.

The geophysical laboratory was engaged in a study of the atomic structure of minerals, especially of the minerals emanating from the interior of the earth, such as the lavas of the Hawaiian Islands and the fumaroles of the Katmai region of Alaska. In 1926 H. S. Roberts assisted that study by improvements in micro-furnaces. Investigations also were conducted looking toward the solution of certain critical problems in earthquake study, and a representative was sent to Chile to study the problems arising from the earthquake of November, 1922. A patent was granted, in 1925, for Dr. John A. Anderson's seismometer for recording and measuring earth tremors. The California earthquake of June 29, 1925, stimulated further seismological research in which scientists of the Carnegie Institution took a leading part.

As a direct result of archaeological investigations in Guatemala and Yucatan, extending over the past decade, agreement was reached with the Mexican government for a ten-year programme of investigation at the ancient Maya city of Chichén-Itzá in Yucatan, where, in 1928, the study of middle American archaeology was advanced by the final restoration, under the direction of Earl Morris, of the Warriors' Temple. Valuable research also was accomplished at Uaxactum, the principal site of the Guatemala excavations.

Along with the specifically archaeological investigations, the researches included a study of the physical characteristics of the Maya race and of the environment in which it developed. Through an advisory committee of eminent biologists, a preliminary programme for studies on the physical basis of human behavior was adopted in cooperation with the Department of

Embryology and with other agencies. This made possible experiment, under Carl G. Hartman, in the growth of macaque embryos. In 1926 significant facts concerning human embryos were established, and it was found that the transformation of white blood cells are concerned in the origin of certain types of malignant tumors. Ecology formed a part of the study of the Mayan civilization, and in 1925 F. E. Morley and his associates did special research work in that field. Other ecological studies concerning environmental relations of plants, which were undertaken at a number of stations in Colorado, Arizona, and other Western States, led to a new interpretation of the development of vegetation.

The department of genetics is located at Cold Spring Harbor, L. I., with a section of experimental evolution, and a eugenics record office. It has carried on researches in variations in the elements of the cell recognized as bearers of characters transmitted to descendants. In May, 1929, a notable celebration of the twenty-fifth anniversary of the founding of the Cold Spring Harbor laboratory was held. In 1921 a laboratory was built for the department of botanical research at Carmel, Calif., to be devoted to chemical and physical research with a view to obtaining additional information concerning the basis of plant activities. This department with laboratories at Tucson, Ariz. and at Carmel, Calif., is now known as the laboratory for plant physiology. The different fields of plant sciences were coordinated in the Division of Plant Biology in 1928 under Dr. H. A. Sporer and, during the year, important work was done in photosynthesis, taxonomic and ecologic problems, arid conditions, and tree growth.

Researches also are carried on in many other lines, such as literature and law. During the World War, two-thirds of the Institution's staff were devoted to work for the Government.

The *Index Medicus*, published by the Carnegie Institution for twenty-four years, was taken over by the American Medical Association in 1927.

Between 1902 and 1928, 573 volumes, on various subjects, were published by the institution. Its total receipts in the same period were \$61,502,218.29, this sum but slightly exceeding the expenditures. A series of lectures on recent researches, initiated in 1921, has become an important personal means of interpreting to the scientific public some of the results of current investigations; and such work was supplemented by comprehensive exhibits in the Administration Building in Washington relative to current progress of work. See EXPLORATION.

CARNOTITE. See RADIUM.

CAROLINE AND PELEW ISLANDS. See PACIFIC OCEAN ISLANDS.

CARPENTER, EDWARD CHILDS (1871- ). A dramatic author and novelist born at Philadelphia, Pa. His well-known plays include: *The Dragon-Fly* (with J. Luther Long); *Captain Courtesy*; *Remembrance*; *The Order of the Rose*; *The Barber of New Orleans*; *Bread upon the Waters*; *The Challenge*; *The Tongues of Men*; *The Cinderella Man* (1915); *The Pipes of Pan* (1917); *The Three Bears* (1917); *Bab* (1920); *Romeo and Jane* (1920); *The Girl and the Highways* (1920); *Pot Luck* (1921); and *Connie Goes Home* (1923). Besides writing many novels, Mr. Carpenter was financial editor of the *Philadelphia Inquirer* 1905-16.

CARPENTER, JOHN ALDEN (1876- ). An American composer, born at Park Ridge, Ill.,

Feb. 28, 1876. Besides taking the regular courses at Harvard University, he at the same time completed the full course in music under Prof. J. K. Paine. In 1906 he studied composition with E. Elgar in Rome and later (1908-12) pursued the same subject with B. Ziehn in Chicago. Although he never followed music as a profession, his compositions show a thorough mastery of all technical means and at the same time pronounced impressionistic tendencies. His works comprise: *The Birthday of the Infanta*, a ballet-pantomime (Chicago, 1919) and a second ballet, *Skyscrapers* (Metropolitan Opera House, Feb. 19, 1926); for orchestra, a symphony, *A Sermon in Stones* (Norfolk Fest., 1917), *Adventures in a Perambulator*, *Krazy Kat*, *A Pilgrim Vision* (Mayflower Tercentenary, 1920); *Concertino* for piano and orchestra; a violin-sonata; a song-cycle, *Gitanjali*, and about 30 detached songs.

**CARPENTIER**, kār-pén-tē-ā, GEORGES (1894- ). French heavyweight boxer, born at Lens, France. He engaged in more than one hundred matches, his most important battles having been with Jack Dempsey (q.v.), world's heavyweight champion in 1921, Battling Siki in 1922, and Tom Gibbons and Gene Tunney (q.v.) in 1924. Defeated by all four, he retired from the ring and started on a theatrical career.

**CARPETS**. See TEXTILE MANUFACTURING, under Wool.

**CARR**, HARVEY (1873- ). An American experimental psychologist, born at Morris, Ill. He was educated at the universities of Colorado and Chicago. After receiving his doctorate, he was an instructor of psychology at Pratt Institute. In 1908, he joined the faculty of the University of Chicago, serving as assistant and associate professor and since 1923 as professor. In 1926 he became chairman of the department. His professional contributions include papers on comparative psychology, visual space perception, and educational theory. He is the author of *Textbook of Psychology*.

**CARR**, HERBERT WILDON (1857- ). An English philosophical writer. He was educated at Oxford, and in his adult life combined the vocation of banker with the writing of semi-popular works on philosophy. He received the honorary degree of D.Litt. (Durham) in 1912, and from 1916 to 1918 was president of the Aristotelian Society. In 1918 he became professor of philosophy at the University of London, King's College, and editor of the *Proceedings of the Aristotelian Society*.

In his works, Professor Carr shows the influence of the philosophy of Bergson and of Croce, for both of whom he became a popular torchbearer. His publications include: *The Problem of Truth* (1912); *Henri Bergson* (1912); *The Philosophy of Change* (1914); *The Philosophy of Benedetto Croce* (1918); *Bergson's Mind Energy* (Translation, 1920); *The Principle of Relativity* (1920); *Gentile's Theory of Mind as Pure Act* (Translation, 1921); *A Theory of Monads* (1922); *The Scientific Approach to Philosophy* (1924); and *Changing Backgrounds in Religion and Ethics* (1927), and *The Unique Status of Man* (1928).

**CARREL**, ALEXIS (1873- ). An American biologist (see VOL. IV). At the outbreak of the World War, Dr. Carrel returned to France as a military surgeon and established a research laboratory in order to determine the most practicable antiseptics and technique for wound dress-

ing. In collaboration with Dakin, he evolved the so-called Carrel-Dakin solution of sodium hyposulphite and this, with the technique devised, was used largely as a standardized method of wound care. In 1917 in collaboration (Carrel and Dehelly) was published the handbook, *Le traitement des plaies infectées*, which appeared simultaneously in English. In collaboration with Professor Tuffier, Carrel also conducted researches on surgery of the orifices of the heart. In 1919 he returned to the Rockefeller Institute, New York City, to resume his original research into the growth and preservation of tissue outside the body, the implantation and grafting of tissues, and cancer.

**CARREL-DAKIN SOLUTION**. See CARREL, ALEXIS.

**CARRINGTON**, FITZ ROY (1869- ). An American editor and curator (see VOL. IV). He resigned as editor of the *Print Collector's Quarterly* in 1918, but became American editor of the same periodical in 1921. Since 1924 he has been with the print department of M. Knoedler & Co., New York. He is the author of: *Engravers and Etchers* (Scammon Lectures, 1921).

**CARROLL**, EARL (1894- ). An American theatrical producer and builder of a plastic and well-appointed theatre in New York City, the Earl Carroll Playhouse. One of his latest improvements in the theatre is a system of building raised platforms and steps by means of unit building-block construction whereby a long, wide flight of stairs can be built in a limited space, as well as platforms of any shape. In 1927 Carroll was convicted of perjury in the United States courts and served a term in the penitentiary at Atlanta, Ga.

**CARSON**, RT. HON. SIR EDWARD HENRY CARSON, BARON (1854- ). British statesman and lawyer (see VOL. IV). He became attorney general in June, 1915, but resigned in October because he felt that the policy of Mr. Asquith's cabinet was to desert Serbia in the World War. From December, 1915, to July, 1916, he was First Lord of the Admiralty, a position which he resigned to become a member, without portfolio, of the War Cabinet (1916-18). After the War, he turned again to Irish affairs, and demanded the repeal of the Home Rule Act. He supported Lloyd George's proposal for the reform of the Government of Ireland by establishing parliaments in both Dublin and Belfast, and his efforts to make this plan a success were rewarded by the overwhelming majority in favor of it in the elections of May, 1921. Sir Edward Carson refused a seat in the new Parliament, and also declined to succeed Mr. Bonar Law as leader in the House of Commons. He quitted active politics in 1921, and accepted a life peerage as Baron Carson of Duncairn. After his retirement, he served as Lord of Appeal in Ordinary.

**CARSON**, HARRY ROBERTS (1869- ). An American Protestant Episcopal Bishop of Haiti, born at Norristown, Pa. He was educated at the University of the South and was ordained in 1896 by Bishop Sessums of Louisiana, in whose diocese he served as general missionary until 1898. During the Spanish-American War, he was chaplain of the 2d Louisiana Infantry. After peace was declared in 1899, he held pastorates in Louisiana, and in 1910 was made Archdeacon of Louisiana. He went to the Canal Zone as missionary in 1912, and founded the Holy Comforter Mission for lepers. He was con-

secrated Missionary Bishop of Haiti in the Cathedral of St. John the Divine, New York City, on Jan. 10, 1923. On Jan. 1, 1928, he also assumed charge of the work of the church in the Dominican Republic.

**CARTELLIERI, G. M. ALEXANDER** (1867- ). A German writer born at Odessa. He studied at the universities of Paris, Tübingen, Leipzig, Berlin, and was professor at Heidelberg and Jena. His principal works include: *Philip II Aug. König von Frankreich* (1899); *Regesten des Bischofs von Konstanz* (1894-5); *Philip II Aug. und der Zusammenbruch des angevinischen Reiches* (1913); *Die Schlacht von Bouvines im Rahmen der europäischen Politik* (1914); *Weimar und Jena* (1913); *Deutschland und Frankreich in Wandel der Jahrhunderte* (1914); *Frankreichs politische Beziehungen zu Deutschland von Frankfurter Frieden bis zum Ausbruch des Weltkriegs* (1918); *Gobineau* (1917); and *Grundzüge der Weltgeschichte 378-1914* (1919). His recent works are *Zum Gedächtnis der Reichsgründung* (1922); *Geschichte der neueren Revolutionen 1624-1871* (1923); *Deutschland in der Weltpolitik seit dem Frankfurter Frieden* (1923), and *Weltgeschichte als Machtgeschichte* (1927).

**CARTER, HOWARD** (1873- ). An English archaeologist, born at Swaffham, Norfolk. He was trained as an artist, and began his work as an archaeologist in Egypt in 1891 under Professor Flinders Petrie, assisting in the excavation of Tel-el-Amarna in 1892. He was Government Inspector-in-Chief of Egyptian Antiquities in Upper Egypt from 1900 to 1905. He made many discoveries, and in 1917 began with Lord Carnarvon the work leading to the finding of the tomb of Tutankhamen in 1923. He visited the United States in 1924, and gave a series of illustrated lectures in New York City on the finding of the tomb of Tutankhamen. He then continued his excavations in Egypt. In addition to articles in archaeological magazines, he has cooperated with his associates in publishing the results of his various excavations:

*Bibân el Molûk, The tomb of Thoïmes IV* (1904); *The Tomb of Hâthorpsitû* (1906); *Five Years' Exploration at Thebes: a record of work done 1907-11* (1912), and *The Tomb of Tutankh-Amen* (with A. C. Mace. 2 vols., 1923, 1927).

**CARTER, WILLIAM HARDING** (1851-1925). An American army officer, born at Nashville, Tenn. He was educated at the Kentucky Military Institute at Frankfort, and served in the Spanish-American War. In 1913 he commanded the 2d Division of the United States Army, and the Hawaiian Department in 1914-15, and retired in 1915. Upon being recalled to active service in 1917-18, he commanded the Central Department at Chicago. He wrote: *From Yorktown to Santiago with the Sixth Cavalry* (1900); *Old Army Sketches* (1906); *Giles Carter of Virginia* (1909); *The American Army* (1915); *Life and Services of Lieutenant Chaffee* (1917); *Horses, Saddles and Bridles*, 4th ed. (1918).

**CARTHAGE COLLEGE.** A coeducational institution at Carthage, Ill., founded in 1870. The student enrollment increased from approximately 80 in 1914 to 308 in 1927-28, and in addition there was a summer-session enrollment in 1928 of 47. The faculty in the autumn of 1928 numbered 28 members. Between the years 1914 and 1928, the endowment was increased

from \$250,000 to \$855,000, and the income in 1927-28 amounted to \$43,500. A campaign for a \$200,000 endowment was successfully completed in 1928; a new heating plant was installed at a cost of from \$25,000 to \$30,000; and a department of agriculture was added to the curriculum beginning with the autumn term of 1928-29. President, N. J. Gould Wickey, Ph.D.

**CARTY, JOHN JOSEPH** (1861- ). An American electrical engineer, born at Cambridge, Mass. He was educated in the Cambridge Latin School and began his active work in telephony in 1879 with the Bell Telephone Company in Boston. In 1887 he was called to the charge of the cable department of the Western Electric Company in New York City and two years later became chief engineer of the New York Telephone Company. In 1908 he became chief engineer of the American Telephone and Telegraph Company and in 1919 vice president of the company. As a pioneer in the development of the telephone, he has invented many improvements, including telephone signaling apparatus, various switchboard and telephone-exchange apparatus, as well as the telephone transmitter from secondary batteries. Among the important achievements accomplished under his direction were the underground telephone cable between Boston and Washington, transcontinental telephone lines, and telephoning without wires from Washington to Hawaii, and from Washington to Paris. During the World War, he was a member of the National Research Council and served in France with the rank of colonel. Later, he was appointed a brigadier general in the Reserve Corps. The Distinguished Service Medal of his own country and the Japanese orders of the Rising Sun and Sacred Treasure were conferred on him and he was made an officer of the Legion of Honor. He received the Longstreth Medal (1903) and the Franklin Medal (1916) from the Franklin Institute, and the Edison Medal (1918) of the American Institute of Electrical Engineers.

**CARUSO, ENRICO** (1873-1921). An Italian dramatic tenor (see VOL. IV). He died at Naples, August 2, 1921. During the last decade of his life, his position as the greatest living dramatic tenor was unchallenged. His last appearance was as Eleazar in *La Juive* at the Metropolitan Opera House (Dec. 24, 1920).—Consult P. V. R. Key and B. Zirato, *Enrico Caruso* (Boston, 1923); Dorothy Caruso and T. Goddard, *Wings of Song: The Story of Caruso* (New York, 1928).

**CARVER, THOMAS NIXON** (1865- ). An American economist (see VOL. IV). Among his later writings are *Essays in Social Justice* (1915); *The Conservation of Human Resources* (1917); *Government Control of the Liquor Business in Great Britain and the United States* (1917); *War Thrift* (1919); *Principles of Political Economy* (1919); *Principles of National Economy* (1921); *The Economy of Human Energy* (1924); *The Present Economic Revolution in the United States* (1925); *Principles of Rural Sociology* (1927); and *This Economic World* (1927).

**CASALS, PABLO** (1876- ). A famous Spanish violoncellist and conductor (see VOL. IV). In 1914 he married the American soprano Susan Metcalfe, and as her accompanist proved himself also a pianist of rare attainments. In 1919 he established in Barcelona the Orquesta Pau Casals, which in a short time he brought



to such perfection that he took it on a tour of France and won new laurels as a conductor of unusual ability. On his first visit to England in this latter capacity, in 1925, he created a furor. In spite of these activities, he never neglected his 'cello, so that he is still regarded as the greatest living 'cellist. On his recent tours of the United States (1926-27-28), he again aroused boundless enthusiasm.

**CASARES GIL, JOSÉ** (1866- ). A Spanish chemist born in Santiago de Galicia, where he studied at the university before going to Salamanca. After serving as professor of chemistry at the University of Barcelona, and dean of its Faculty of Sciences, he accepted the chair of chemistry at the Central University, at Madrid. He has served twice as Senator for the University of Santiago. He was influential in establishing traveling fellowships for Spanish students attending foreign universities.

**CASE, SHIRLEY JACKSON** (1872- ). An American educator and theologian born at Hatfield Point, New Brunswick, Canada. He was educated at Acadia University (Nova Scotia), Yale, and the University of Marburg. He instructed in mathematics and Greek, and, 1906-08, was professor of the history and philosophy of religion at Bates College, Lewiston, Me. In the year 1908, he went to the University of Chicago where he subsequently became professor of early church history and New Testament interpretations, 1917-25, and of the history of early Christianity after 1925. In 1923 he was made head of the department of church history. He was managing editor of the *American Journal of Theology* (1912-20) and editor of the *Journal of Religion* after 1927. He was author of: *The Historicity of Jesus* (1912); *The Evolution of Early Christianity* (1914); *The Millennial Hope* (1918); *The Revelation of John* (1919); *The Social Origins of Christianity* (1923); *Jesus—a New Biography* (1927).

**CASELLA, ALFREDO** (1883- ). An Italian composer, one of the leaders of the modernists, born at Turin. He was taught by his mother until 1896, when he entered the Paris Conservatoire, studying under Diémer (piano, 1st prize, 1899) and Fauré (composition). He then made extensive tours of Europe as a pianist and conductor. From 1912 to 1925, he was professor of advanced piano classes at the Conservatoire, and then accepted a similar position, as Sgambati's successor, at the Liceo Musicale di S. Cecilia in Rome, which he resigned in 1923 to devote all his time to concert tours and the propagation of modern music. In 1917 he founded in Rome the Società Nazionale di Musica Moderna, which, in 1923, as Corporazione delle Musiche Nuove Italiane, was affiliated as the Italian section with the International Society for Contemporary Music. His first tour of the United States (1921), when he appeared as pianist and conductor of his own works, was so successful that he has revisited this country every year since then. In 1928 he was the regular conductor of the summer concerts of the Boston Symphony Orchestra. In 1926 he was made chevalier of the Legion of Honor. His works for orchestra include two symphonies; *Italia*, a rhapsody on Sicilian and Neapolitan folk-tunes; *Suite in C*; *Le Couvent sur l'eau*, a symphonic suite; *Elegia eroica*; *Pagine di Guerra*; *Prologue pour une tragédie*; *Pupazzetti*; *Concerto Romano* for organ and orchestra; *Scarlattiano*, for piano and orchestra; *Notte di*

*Maggio* for chorus and orchestra; 2 choreographic comedies. *La Giara* (Paris, 1924; New York, 1927), and *Il Convento veneziano* (Milan, 1925); chamber music; many pieces for piano; and songs (several cycles). He also published a history of music, *L'Evoluzione della Musica* (1924), which was translated in French and English.

**CASE/MENT, SIR ROGER DAVIS** (1864-1916). Irish revolutionist. From 1895 to 1913, he was in the British consular service, distinguishing himself by his efforts to suppress cruelty to the natives in the Congo Free State and in Brazil. In 1916 he aided in the Sinn Féin revolt. After passing some months in Germany, where he was believed to have engaged in a treasonable plot, he was captured in Ireland, Apr. 21, 1916, on landing from a German submarine, was convicted of high treason, June 20, and hanged on August 3. See IRELAND under *History*.

#### CASE SCHOOL OF APPLIED SCIENCE.

An engineering college in Cleveland, Ohio, founded in 1881. The student enrollment in the autumn of 1928 was 642, as compared with 538 in 1923, and practically the same number in 1913. The faculty increased from 45 members in 1913 to 69 in 1928, the library from 13,505 to 24,485 volumes, and the endowment from \$2,458,788 to \$4,040,315, the income for 1928 being \$357,109. The school received as a gift from Worcester R. Warner and Ambrose Swasey a student observatory equipped with an object glass of 10-inch aperture, two astronomical transits of 3- and 4-inch aperture, a 4-inch zenith telescope, a 2-inch theodolite, and two Riefler clocks. Professor Dayton C. Miller of the school devised a method of photographing sound waves, through which it was possible to make complete analysis up to 30 different components of any musical sound, and thus tell exactly what tones and overtones any musical instrument gives out; and so to compare any two musical sounds, as, for example, the notes of two pianos with each other, to determine which is the finer instrument. During 1926 gifts to the amount of \$1,670,000 were received, and a new mechanical engineering laboratory, to cost, with equipment, \$500,000, was begun, and in 1928 a mechanics and hydraulics laboratory, costing about \$155,000, was finished. President, Charles Sumner Howe, Ph.D., D.Sc., LL.D.

**CASIMIRI, RAFFAÈLE CASIMIRO** (1880- ). A noted Italian composer and musicologist, born at Gualdo Tadino, Umbria. He received his musical education from L. Bottazzo in Padua and began his career as editor of *Rassegna Gregoriana* in Rome in 1901. After several years' activity as *maestro di cappella* in various seminaries and churches in Teano, Capua, Perugia, and Vercelli, he was called, in 1911, in the same capacity to San Giovanni in Laterano in Rome. In 1922 he founded the Società Polifonica Romana, a chorus of 60 trained singers, which he brought to such perfection that he undertook extended concert tours, through Europe, and, in 1927, also visited the United States. Besides contributing in a practical manner toward reviving interest in the older *a cappella* music, he published the results of original researches in various periodicals and books. Of the latter, the more important are *G. P. da Palestrina: Nuovi documenti biografici* (1918 and 1922), *Nuove ricerche sul Palestrina* (1923), *La rinascita della musica sacra nel*

*secolo XVI* (1924). His compositions include two oratorios, *San Pancrazio* and *Santo Stefano*; *Madrigali e Scherzi* for mixed chorus; numerous litanies, offertories, motets, and several masses.

**CASSEL**, kās'sel, GUSTAV (1866- ). A Swedish economist and student of mathematics who studied at Stockholm and abroad. Early in his career he instructed in national economy at the high school in Stockholm, and about the same time published *Das Recht auf den vollen Arbeitsertrag* (1900), and *The Nature and Necessity of Interest* (1903). Many times after 1905, he was identified with state financial matters in Sweden. In 1921 he was one of the Swedish representatives at the London meeting of the International Chamber of Commerce, and in 1922 he was a member of the international commission to stabilize the German mark. He published *The Theory of Social Economy* (1918, Eng. trans. 1923), and his *Memorandum on the World's Monetary Problems* was published by the League of Nations for the International Financial Conference in Brussels in 1920. Other works include *Germany's Economic Power of Resistance* (1916); *The World's Monetary Problems* (1921); *Money and Foreign Exchange After 1914* (1922); *Fundamental Thoughts in Economics*, lectures delivered at the University of London (1925); *Recent Monopolistic Tendencies in Industry and Trade* (1927); *Foreign Investments* (1928), and *Post-War Monetary Stabilization* (1928).

**CASSIRER**, kās'-sē-rār, ERNST (1874- ). A German philosopher of the neo-Kantian school (see VOL IV). His work has been made available in English through the translation of *Substanz und Funktion*, to which has been added in the same volume some chapters on Einstein's theory of relativity. His more recent works include *Freiheit und Form* (1918), *Heinrich von Kleist und die Kantische Philosophie* (1917), and *Zur Einsteinschen Relativitätstheorie* (1921). The English translation of *Substanz und Funktion* and *Einstein's Theory of Relativity*. Professor Cassirer edited a new edition of Kant's works in 11 volumes, and wrote the concluding biographical volume (1912-18). Among his latest works are *Philosophie der symbolischen Formen* (1923), *Sprache und Mythos* (1925), *Individuum und Kosmos in der Philosophie der Renaissance* (1927). Since 1919 he has been at the University of Hamburg.

**CASTELLANI**, ALDO (1875- ). An Italo-British physician; authority on tropical medicine, born at Florence and educated at the Universities of Florence (M.D., 1899), Bonn, and the London School of Tropical Medicine. His earlier years of practice were occupied in part by the study of tropical diseases, notably African sleeping sickness and yaws. In this research, he represented in part a special commission from the Royal Society of England. He was professor of tropical medicine at the Ceylon Medical College (1903-15), and at the Royal University of Naples (1915-19). Since 1919 he has been visiting lecturer at the London School of Tropical Medicine and director of tropical medicine for the Ross Institute. On the outbreak of the World War, he was made a lieutenant colonel of the Royal Italian Medical Service. In 1926 he became professor of tropical medicine at Tulane University, New Orleans. He is best known by his exhaustive work, written

in collaboration (Castellani and Chalmers), *A Manual of Tropical Medicine* (1910, 4th ed. 1923). In 1927 appeared *Fungi of Fungal Diseases*.

**CASTELNAU**, ká'stel-nō', EDOUARD VICOMTE DE CURIÈRES DE (1851- ). A French general, who was educated at Saint-Cyr and the École de Guerre. He served in the Franco-Prussian War, in Cochinchina and Algeria, before the World War, was a member of the Superior War Council, and in 1914 was in command of the 2d French Army. He early distinguished himself as the "Savior of Nancy" with the result that in December, 1915, he was made chief of the general staff. In this capacity, he went to Greece and helped plan the defenses of Saloniki, and in 1916, he aided in the defense of Verdun. Early in 1917, he was sent on a mission to Russia, and on his return he commanded the armies of the East, until the close of the war. A remarkable soldier, it was said that only political enmities prevented his rise to the highest military post France had at her disposal. A nationalist and member of the Bloc National, he was elected to the Chamber of Deputies in 1919, and later became a Senator. He was president of the Liges des Patriotes (1923- ) and of the Fédération Nationale Catholique. Consult *Le Général de Castelnau* by V. Giraud (1921).

**CASTLE**, EGERTON (1858-1920). An English novelist (see VOL IV). His later novels, written for the most part in collaboration with his wife, Agnes Castle, include: *The Ways of Miss Barbara* (1914); *The Hope of the House* (1915); *The Black Office* (1917); *Wolf Lure* (1917); *Minniglen* (1918); *New Wine* (1919); *Little Hours in Great Days* (1919); *John Seneschal's Margaret* (1920).

**CASTRO**, MATILDE (1879- ). An American educator born in Chicago. She was educated at the University of Chicago and taught philosophy as a member of the faculties of Mount Holyoke College, Vassar College, and Rockford College. In 1913, she was called to Bryn Mawr as director of the model school and professor of education. In 1923 she was married to Dean James H. Tufts of the University of Chicago. She is the author of *The Respective Standpoints of Psychology and Logic* (1913).

**CATALAN MOVEMENT**. See SPAIN, under *History*.

**CATALYSIS, CATALYSTS**. See CHEMISTRY; and CHEMISTRY, APPLIED.

**CATERPILLAR TRACTOR**. See TRACTOR.

**CATHER**, WILLA SIBERT (1876- ). An American author born at Winchester, Va. She was educated at the University of Nebraska, and shortly after her graduation went into journalistic work. In 1906-12, she was associate editor of *McClure's Magazine*. Miss Cather is a writer who deals simply and profoundly with the problems of life, presenting them in a direct style. She received the degree of Litt.D. from Yale University in 1929. Among her works are *April Twilight* (1903), a book of verse; *The Troll Garden* (1905), which attracted considerable attention; *Alexander's Bridge* (1912); *The Bohemian Girl* (1912); *O Pioneers* (1913); *The Song of the Lark* (1915); *My Antonia* (1918); *Youth and the Bright Medusa* (1920); *One of Ours* (1922); *A Lost Lady* (1923); *The Professor's House* (1925); *My Mortal Enemy* (1926); and *Death Comes for the*

*Archbishop* (1927). One of *Ours* won the Pulitzer Prize as the best novel published in 1922.

**CATHOLIC CHURCH.** See ROMAN CATHOLIC CHURCH.

**CATHOLIC UNIVERSITY OF AMERICA.** An institution of higher learning located at Washington, D. C.; established in 1887 by the Hierarchy of the United States. It includes the schools of theology, canon law, law, philosophy, letters, and sciences; graduate schools of sciences, law, and philosophy; and affiliated with it are the Catholic Sisters for the training of teachers, Trinity College for young women, and the houses of study of 20 religious orders. The student body in the university proper in the autumn of 1928 numbered 893, the faculty 113 members, and the library contained 273,000 volumes. The summer session of 1928 had an enrollment of 742. The productive funds amounted to \$2,648,778 and the income for the year to \$748,671. An important advance in the way of organization occurred in 1923 with the establishment of the School of Canon Law; and in the way of equipment, in the construction of the Martin Maloney Chemical Laboratory. A gymnasium was constructed with floor space of 44,000 square feet, and a stadium was started in 1924. Toward the construction and equipment of the John K. Mullen Memorial Library, begun in 1925, additional sums of money were contributed by Mr. Mullen of Denver, Colo., in subsequent years. The Hierarchy of the United States also contributed various sums of money toward the construction of a home for ecclesiastical professors. Periodical publications of the university were: *The Catholic Educational Review*; *The Catholic Historical Review*; *The Catholic Charities Review*; and the *Corpus Scriptorum Orientalium*. Rector of the University, Monsignor James H. Ryan, Ph.D., S.T.D., who succeeded the Rt. Rev. Thomas J. Shahan, S.T.D., J.U.L., LL.D. Titular Bishop of Germanicopolis, in 1928.

**CATT, CARRIE CHAPMAN** (1859- ). An American suffrage leader (see VOL. IV). In 1920 she had the pleasure of seeing the work of a lifetime crowned with success when the women of America went to the presidential polls for the first time. In June, 1920, she was reelected president of the International Woman Suffrage Alliance, and in 1923 she was made honorary president on her announcement that thereafter all her activities were to be devoted to the newly formed Pan-American Union. Her extensive travels during the years 1920-24, in Europe and South America, influenced greatly the progress of woman suffrage.

**CATTELL, J(AMES) MCKEEN** (1860- ). Psychologist and educator (see VOL. IV). He was dismissed from Columbia University under war conditions (1917), but in the course of a legal battle with the university was able to recover the amount of his pension. In 1919 he published a volume attacking the administration of the Carnegie pensions for university professors. Retired from active teaching, he continued his educational work as editor of *The Scientific Monthly*, *School and Society*, and *Science and Education*. He published his fourth edition of *American Men of Science* in 1927. He was president of the American Association for the Advancement of Science in 1924 and in 1929 was president of the International Psychological Congress at New Haven.

**CATTLE.** See DAIRYING; LIVE STOCK; VETERINARY MEDICINE.

**CAVALRY.** See ARMIES AND ARMY ORGANIZATION; STRATEGY AND TACTICS.

**CAVE, GEORGE, VISCOUNT** (1856-1928). An English jurist, born in London. He was educated at St. John's College, Oxford, and began the practice of law in 1880. He was a member of Parliament from 1906 to 1918, when he was created a viscount. Among the many important posts he filled were those of standing counsel of Oxford University (1913-1915); attorney general to the Prince of Wales (1914-15); Solicitor General (1915-16); Home Secretary (1916-1920); and a Lord of Appeal (1919-20). He was chairman of the Southern Rhodesia Commission (1919-20), of the Munitions Inquiry Tribunal (1921), and of the Committee on Trade Boards (1921-22). He was Chancellor of Oxford University from 1925-28. In the Baldwin cabinets, he was Lord Chancellor from Oct. 25, 1922, to Jan. 21, 1924, and from Nov. 4, 1924, until his resignation on Mar. 28, 1928, the day before his death. On the same day, his advancement to an earldom was announced. For a short time in 1927, he was acting Prime Minister. He edited several legal treatises.

**CAVELL, EDITH** (1865-1915). A British nurse born at Swardeston, Norfolk. She was educated in England and Belgium and in 1895 entered a London hospital as probationer. She held various positions as superintendent and matron, and in 1907 was appointed the first matron of the Berkendael Medical Institute at Brussels. During the World War, the institute became a Red Cross hospital. On August 5, 1915, Miss Cavell was arrested by German officers on the charge of having assisted British, French, and Belgian soldiers to escape from Belgium. She admitted the charge and was sentenced to be shot on October 11. An unsuccessful appeal for postponement of the execution was made by Brand Whitlock and the Marquis de Villalobar, American and Spanish Ministers in Brussels, respectively. The German surgeon and the priest who were present at the execution both stated that she was killed by the volley of the firing squad. The circumstances of the execution provoked widespread indignation and Miss Cavell was regarded as a martyr not only in England but in other countries. A memorial service at Westminster Abbey, attended by Premier Asquith and representatives of the royal family, was attended by a vast multitude. A statue, by Sir G. Frampton, was erected to her memory opposite the National Portrait Gallery, London. In 1928 the controversy as to the manner of her execution was renewed by the appearance of the British film *Dawn*, in which, at the scene of the execution, Miss Cavell was represented as fainting after the shooting of a soldier who refused to fire. She was not killed by the volley of the firing squad, according to the film, but was shot by the officer who then killed himself. The German government protested against this presentation of the execution, and Sir Austen Chamberlain, the British Foreign Secretary, opposed the exhibition of *Dawn* in England. The literature about her includes *A Noble Woman*, by Ernest Protheroe (1916); *The Case of Miss Cavell; from the unpublished documents of the trial: the property of a commissary of the German government*; interpreted by Ambrose

Got (1920), and *With Edith Cavell in Belgium*, by Jacqueline Van Til (1922).

**CAWTHORN, JOSEPH (BRIDGER)** (1869- ). An American actor born in New York City. He was educated at home by his mother and appeared on the stage as a child in Robinson's Music Hall, New York, in 1871, then with Haverly's Minstrels. He was taken to England at the age of nine, and was comedian in several musical plays. In 1910 he appeared as Oscar Spiel in *Girlies* at the New Amsterdam Theatre, New York. This was followed by his appearance as Louis von Schloppenbauer in *The Slim Princess* in 1911. He played in *Sybil* during 1916-17, in *Rambler Rose* in 1918, and as Timothy in *The Canary* during 1919-20. He also took the part of the Hon. Hudson Hobson in *The Half-Moon* in 1920. In 1926 he went into moving pictures.

**CECIL**, sēs'ul or sīs'ul (EDGAR ALGERNON) ROBERT, FIRST VISCOUNT OF CHELWOOD (1864- ). An English statesman, third son of the Marquis of Salisbury. He was educated at Eton and University College, Oxford, and read for the bar. After two years as private secretary to his father (1886-88), he devoted himself to the law until 1906, when he was elected to Parliament as a Conservative. He fought against disestablishment, social legislation, and tariff reform, and it was the last issue that brought on his defeat in 1910. He was reelected in 1911 and sat after that for the Hitchin division, Hertfordshire, until 1923 when he was created Viscount Cecil of Chelwood. During the World War, he displayed his great abilities in the difficult offices of Parliamentary Under-Secretary for Foreign Affairs (1915-16), Minister of Blockade (1916-18), and Assistant Secretary of State for Foreign Affairs (1918). His subsequent career took on something of the nature of a crusade. He early became convinced of the necessity for some such instrument as the League of Nations to preserve international peace and together with General Smuts, among the British, threw himself wholeheartedly into the movement. With Smuts, he was British representative on the League of Nations' Commission, and it was as a result of Smuts's intercession that South Africa tendered him her seat in the League Assembly, when Lloyd George passed him over. He continued on the Assembly for South Africa into 1923. In April, 1923, he came to the United States in the interests of the League. As the head of the League of Nations Union, he worked untiringly in the interest of universal peace. In 1923 he entered the short-lived Baldwin cabinet with the portfolio of Lord Privy Seal. From 1924 to 1929, he was Chancellor of the Duchy of Lancaster in the second Baldwin government. He was an ardent believer in disarmament and represented Great Britain on the League Preparatory Commission for Disarmament and at the tri-power naval Disarmament Conference at Geneva in 1927. He loyally followed the cabinet instructions, but, when the Conference ended as a failure, he claimed that if the Government had really desired a successful outcome it could have been achieved. Because he could no longer endorse the foreign policy of his government, he resigned. He wrote *Conservatism and Peace* (1928) and *The Way of Peace*, a selection from his writings and speeches (1928), and was joint author of *Principles of Commercial Law and Our National Church*.

**CECIL, RT. HON. LORD HUGH (RICHARD HEATHCOTE)** (1869- ). An English politician, fifth son of the Marquis of Salisbury. He received his education at Eton and University College, Oxford, and for a time was a Fellow of Hertford. He entered politics in 1895 as a Conservative and served in Parliament continuously to 1906. He was among the young Conservatives to take a stand against Chamberlain's tariff programme, and as such, gained an excellent reputation. He was defeated in 1906 and not returned again until he was sent up by Oxford in 1910, a seat he held from that time on. In 1921 he followed his brother, Lord Robert (q.v.), in the break from Lloyd George. A brilliant orator, he was the spokesman of the High Church Party in the House of Commons. His book *Conservatism* was the best expression of the philosophical implications of the doctrine in his generation.

**CELESTIAL MECHANICS.** See **ASTRONOMY**.

**CELLULOSE.** See **CHEMISTRY, APPLIED; EXPLOSIVES; SILK, ARTIFICIAL.**

**CEMENT.** An important development since the World War has been the larger use of concrete for many forms of construction of widely different types. This naturally has led to an increased demand for cement, and with it came various improvements in the scientific proportioning of the constituents and control over the manufacturing processes so as to obtain a uniform and standard material of carefully specified characteristics. In the United States, Portland cement makes up the bulk of the cement output. It is manufactured by calcining to incipient vitrefaction a mixture of limestone and clay marl, or blast-furnace slag, in the approximate proportions of one part of clay or shale to three of limestone. In the United States, 125 plants were engaged in the production of cement in 1921, according to the census of manufactures for that year. In 1928 the number of plants so engaged had increased to 160 according to an estimate by *Rock Products*. Machinery is extensively used in the preparation, handling, and packing of the material and consequently the industry gives employment to a relatively small number. According to *Rock Products*, 36,292 wage earners produced 173,206,513 barrels of Portland cement with an estimated production of 1.6 barrels per man-hour. The consumption of fuel and power is unusually heavy and, from the standpoint of power demand, the Portland cement industry ranks among the first ten manufacturing industries.

The value of Portland cement shipments in 1928 in the United States was \$275,885,902, as compared with \$278,854,647 in 1927, though the tonnage output in 1928 was slightly greater than in 1927. The average factory price per barrel in 1928 was \$1.52 according to *Rock Products*. The cement industry is well distributed throughout the country. The most important area of production is Eastern Pennsylvania, in the Lehigh district, where is found a valuable raw material known as cement rock. This region is not only the greatest producer but has the largest number of plants, and is followed in order of importance by California and a district comprising Illinois, Indiana, and Michigan. The general tendency in cement manufacturing has been to install large plant units and to exercise greater care in the process

of manufacture. New plants continue to be built though the industry in 1929 was operating at only about 75 per cent of capacity. More economical utilization of waste steam has reduced production costs in many plants.

The production of Portland cement in the United States in 1928 was 176,195,488 barrels from 156 plants as compared with 173,206,513 barrels from 153 plants in 1927. The production of masonry, natural, and puzzolan cements in the United States in 1928, as reported by the U.S. Bureau of Mines, was 2,210,404 barrels, valued at \$2,910,097.

Cement manufacturing in Europe was naturally interfered with by the World War, but was gradually resumed as the reconstruction progressed. France was a leader in this respect, not only using considerable amounts of cement in her own reconstruction work, but she also was able to restore the markets of the other countries. In Belgium, the annual pre-war output was gradually approached again as conditions returned to normality. In England, the industry suffered considerably after the War on account of high coal and labor costs and the large amount of foreign imports. In Germany, activity was restricted after the War, and the loss of coal fields and the consequent necessity of importing fuel restricted production, though in Westphalia pre-war conditions had been reached by 1922. Subsequent to the War, a cement industry was established in China; Japan was already productive.

Besides Portland cement, higher alumina cements were developed in France and latterly in the United States. These cements, while they do not set more rapidly, show a greater strength after 24 hours than that of Portland cement after 28 days. A greater resistance to the chemical attacks of sea water and sulphate-bearing ground waters was also claimed for them. Alumina cement was more costly, as high-grade aluminium ore, such as bauxite, was largely required in the manufacture.

The method of using alumina cement is

#### PORTLAND CEMENT PRODUCED IN THE UNITED STATES, 1917-1928, IN BARRELS

According to U. S. Bureau of Mines (1928 estimate by Rock Products)

1917	92,814,202
1918	71,081,663
1919	80,777,935
1920	100,023,245
1921	98,842,049
1922	114,789,984
1923	137,460,238
1924	149,358,109
1925	161,658,901
1926	157,295,212
1927	173,206,513
1928	175,968,000

much the same as that for Portland cement, except that wetter mixtures are used, and it must be used alone, not mixed with Portland cement. The cement, though not quick in setting, so

that ample time must be afforded for mixing, setting, transporting, and placing, nevertheless develops very rapidly, after setting, the high strength which is its principal advantage. During the War, alumina cement was used by the French Army in the construction of concrete foundations for big guns which were ready for operation within 24 hours. To offset its higher cost, alumina cement possesses or was thought to possess many superior properties.

#### APPARENT CONSUMPTION OF PORTLAND CEMENT

	Barrels	Value
1922	116,897,194	\$204,593,075
1923	136,589,066	257,704,348
1924	147,192,669	264,571,342
1925	159,943,073	281,357,462
1926	164,456,987	280,122,525
1927	173,098,182	279,014,381
1928	176,913,695	268,307,281

**CENSUS.** The Fourteenth Decennial Census of the United States was taken as of Jan. 1, 1920. It covered population, agriculture, manufactures, forestry and forest products, and mines and quarries. Over 90,000 enumerators were employed to collect the data in regard to population and agriculture. The enumerators worked under the supervision of 372 district supervisors who were appointed especially for this task. The results of the Fourteenth Census, as published, comprised 13 quarto volumes—four on population, four on agriculture, three on manufactures, one on irrigation and drainage, and one on mines and quarries—in all, over 12,000 pages of printed matter consisting mainly of statistical tables.

The Fifteenth Decennial Census was provided for by the Act of June 18, 1929, to be taken as of Apr. 1, 1930, and to include all the subjects covered by the previous census and also the subject of distribution, or wholesale and retail trade, and unemployment. This act is the first since 1850 to combine the census and congressional apportionment. The personnel required for this Fifteenth Census was estimated at over 100,000 enumerators and about 550 supervisors. The actual period of enumeration was planned, as a rule, not to extend beyond two weeks in cities and one month in country districts. The population census reports the sex, color, age, marital status (whether single, married, widowed, or divorced), nativity, and occupation of each person. It also carries questions as to school attendance, and whether able to read and write, and to speak English; and in the case of the foreign-born, it asks whether naturalized or alien and the year of immigration to the United States. The population census of 1930, as required by law, was to include also two or three more questions in regard to unemployment.

The agricultural schedule carries questions as to acreage, tenure, value of farms, farm implements or machinery, different classes of live stock, crops raised, etc. In all, there probably will be about 350 questions on the agricultural schedule and 25 or 30 on the population schedule.

#### SUPPLIES OF PORTLAND CEMENT IN THE UNITED STATES 1922-1928

Year	Domestic shipments		Imports		Exports	
	Barrels	Value	Barrels	Value	Barrels	Value
1922	117,701,216	\$207,170,430	323,823	\$ 628,846	1,127,845	\$3,206,201
1923	135,912,118	257,648,424	1,678,636	2,964,098	1,001,688	2,944,174
1924	146,047,549	264,046,708	2,023,663	3,139,788	878,543	2,615,154
1925	157,295,212	278,524,108	3,667,458	5,836,482	1,019,597	3,003,128
1926	162,187,090	277,963,432	3,244,223	5,154,926	974,326	2,995,833
1927	171,814,728	278,854,647	2,050,180	2,956,451	816,726	2,796,717
1928	175,455,000	288,125,000	2,283,351	3,120,983	824,656	2,938,702



The census of manufactures, which is now taken every two years, covers quantity and value of products; number of employees; amounts paid for wages; salaries, materials, and contract work; horse power; coal used; and other facts regarding the industries of the United States.

Under the law of 1920, a period of three years—known as the census period—is allowed for the completion of the census. That is none too much time for inspecting and coding the schedules, punching the cards, making various runs through the electric tabulating machines, preparing the copy for the printer, and publishing the results. This is the first census law to provide that the results of the census shall be sent to Congress by a specified time.

The decennial censuses, although of great magnitude, are only a part of the many activities of the Bureau. The Bureau operates at full speed at all times. It collects and publishes yearly statistics concerning births and deaths; financial statistics of States and cities; marriage and divorce; and forest products, including the production of lumber, lath, shingles, wood pulp, and the consumption of pulpwood. Quinquennially, the Bureau takes a census of electrical industries, including electric railways, telegraphs, telephones, and central electric light and power stations. The census of agriculture has now been made quinquennial, since the law provides that such a census shall regularly be taken in the fifth year following the decennial census. Commencing in 1921, a census of manufactures has been taken every two years. Such a census had previously been taken at five-year intervals. Decennially, but not always during the three-year regular decennial census periods, the Bureau publishes life tables; information relating to institutional population, that is, prisoners and juvenile delinquents, insane in hospitals, feeble-minded and epileptics, paupers in almshouses; religious bodies; transportation by water; and wealth, debt, and taxation.

The Bureau issues the *Monthly Survey of Current Business* containing important current statistics on domestic, industrial, and commercial movements. It collects and publishes also, either semi-monthly, monthly, quarterly, or semi-annually, statistics of production, stocks, and consumption, covering various key commodities, such as cotton; hides, skins, and leather; boots and shoes; clothing; hosiery; wool consumption and stocks; tobacco; sugar; etc. For the use of various interested organizations, it has made annual estimates from time to time, between the decennial announcements of the population of States, counties, and cities, for use during intercensal years. At two-year intervals, the Bureau issues an Official Register or directory of persons in the service of the United States, exclusive of the Army and Navy.

**CENTRAL AMERICAN UNION.** A plan proposed in 1917 for a federal republic, which after preliminary negotiations failed in 1922. Later in that year at the suggestion of the President of Nicaragua, who was known to be under the influence of Washington, a conference was held on board the United States cruiser, *Tacoma*, in Fonseca Bay. It was attended by the presidents and cabinets of Nicaragua, Honduras, and Salvador, and by the United States ministers to those countries. It renewed some of the features of the 1907 treaty, which had been practically rendered ineffective by Nicaragua's refusal, with Wash-

ington's support, to accept the decree of the Central American Court relative to Fonseca Bay, although Guatemala and Costa Rica refused to adhere to the *Tacoma* agreement on the grounds that the Treaty of 1907 was still in force. This conference also led, in October, 1922, to the calling by Secretary Hughes of a further conference of the five republics to meet in Washington for the purpose of reinforcing the 1907 pact and other matters. The sittings commenced on Dec. 4, 1922, and ended on Feb. 7, 1923. The plan of a Central American Union was voted down by Guatemala, Nicaragua, and Costa Rica, but a treaty of peace and amity to supplement the treaty of 1907 was signed, as well as 14 conventions relating to a Central American tribunal, international commissions of inquiry, limitation of military, naval, and air forces and armaments, free trade (Costa Rica dissenting), etc. Unfortunately, the treaty contained no guarantees against war and was hardly considered by Central Americans an adequate substitute for a federal union.

**CENTRAL STATIONS.** See ELECTRIC POWER STATIONS AND GENERATING APPARATUS; POWER PLANTS, STEAM ENGINES AND TURBINES.

**CENTRAL UNIVERSITY OF KENTUCKY:** See CENTRE COLLEGE.

**CENTRE COLLEGE.** An institution for the higher education of men at Danville, Ky., founded in 1819. The student enrollment increased from 107 in 1914 to 333 in 1927-28; the faculty increased from 18 in 1923 to 28 in 1928; the endowment, which in 1914 amounted to \$380,000, aggregated \$1,249,106 in 1928; the total income from all sources for the year 1927-28 was \$127,401 and plant assets in 1928 were \$501,762, bringing the total assets up to \$1,750,868. The library, which had 30,000 volumes in 1923, had 31,711 in 1928. In 1918 the name of the institution was changed from Central University of Kentucky, which it had been called since 1901, to its original name, Centre College, and in 1926 the Kentucky College for Women was taken over by Centre College and conducted as the Woman's Department of Centre College, a coördinate institution. In 1923 a stadium seating 8500 people was added to the equipment of the college. President, Charles J. Turck, A.M., LL.D.

**CÉSPEDES,** thäs'pá-däs, CARLOS MANUEL DE (1871- ). A Cuban diplomat, son of the first President of Cuba, born in New York City and educated in the United States, France, and Germany. He was governor of the Province of Santiago de Cuba (1895-98), and from that time on was active in the affairs of Cuba, favoring liberal measures. He was vice president of the House of Representatives (1902-08), represented Cuba in Italy, Greece, and Argentina, successively (1909-14), and was Envoy Extraordinary and Minister Plenipotentiary to the United States (1914-22). He became Secretary of State in 1922 and on Nov. 17, 1926, resigned, and went to Paris as minister.

**CEYLON,** sê-lôn'. An island and British Crown colony situated in the Indian Ocean off the coast of Hindustan. In 1921 its resident population was 4,497,854, an increase of 9.6 per cent over the last decennial census. Of these, the Europeans totaled 8099 (8524 in 1911); Burghers, 29,403 (26,673 in 1911); Singhalese, 3,015,970; Tamils, 1,119,699; "Moors," 284,848, others 26,440. The non-resident population, i.e., military, shipping, etc., was 6696.

The estimated population in 1927 was 5,124,992. The principal towns had the following populations in 1921: Colombo, 244,000 (213,396 in 1911); Galle, 39,100 (40,187 in 1911); Jaffna, 42,400; Kandy, 32,000. Agriculture continues as the leading activity, 3,000,000 acres out of the total 10,212,400 acres being under cultivation in 1922. In 1925 the distribution was as follows: paddy, 834,000 acres; other grain, 104,000 acres; cacao, 35,000 acres; cinnamon, 25,000 acres; tea 442,000 acres; coconuts, 883,000 acres; rubber, 475,000 acres (215,000 in 1911). In 1928 export of tea totaled 217,000,000 pounds (186,594,000 pounds in 1911); the export of rubber, 131,840,500 pounds, of which 81,625,400 pounds went to the United States. The commercial record shows a continual improvement, in 1926 the imports being worth £28,075,198 and the exports (including re-exports) £29,951,583, as against £13,309,386 and £15,657,570 for 1913. Principal exports in 1927 were: Copra, £2,122,988; coconut oil, £1,104,518; tea, £14,246,123; coconuts, £801,006 desiccated £1,365,451; rubber, £3,650,509. The principal imports included cotton goods, rice, coal and coke, and sugar. In 1927 total tonnage entered and cleared was 21,394 tons (14,926,764 in 1911) of which 13,152,000 tons were British (9,571,159 in 1911). In the same year, 851 miles of railway were open. For 1926-27 the budget contained the charges: for revenue, £8,623,928; for expenditures, £8,069,753. The public debt at the end of 1926 amounted to £12,057,393 sterling and 3,000,000 rupees. By an Order in Council of December, 1923, certain changes in Ceylon's administrative machinery were effected. The size of the legislative council was increased, the unofficial members being placed in the majority.

**CHAFEE, ZACHARIAH, JR.** (1885- ). An American law professor, born at Providence, R. I. He was educated at Brown University and the Harvard Law School and for a time engaged in the private practice of law. In 1916 he went to the Harvard Law School where he was made a professor in 1919. He was among the first to protest against the violation of the constitutional liberties of American citizens in the years following the World War. In company with Dean Pound and Felix Frankfurter of the Harvard Law faculty, among others, he helped evolve a sociological point of view toward the law. He was chairman of the Committee on Coal and Civil Liberties reporting to the U. S. Coal Commission in 1923. He wrote: *Cases on Negotiable Instruments* (1919); *Freedom of Speech* (1920); *Cases on Equitable Relief against Torts* (1924), and *The Inquiring Mind* (1928).

**CHAIN STORES.** By "chain" stores are meant groups of retail establishments which are operated under a common management and ownership. They may be "branches" of a large parent institution, or they may be establishments of substantially the same size, none of them much superior to any of the others, and all of them operated from a management office at headquarters. These "units" may, when required, be organized as independent corporations whose stock is then held by the management company (as in the case of banks), or they may be simply retail establishments which are actually owned and directly operated by the management concern without the intervention of a stock or corporate organization in any form.

**Origin and Scope.** Chain-store operation in some form has been carried on in the United States for quite a while. The Great Atlantic & Pacific Tea Co. dates from 1859, the Jones Tea Co., from 1872. The F. W. Woolworth Co., was organized in 1879, the James Butler enterprise in 1882, while among the more recent were S. S. Kresge Co., which, however, takes its rise from 1897, the United Cigar Stores, which dates from 1900, and the J. C. Penney Co., from 1902. Great difference of scope, however, exists among the different chains. Some of them assert that they have a unit in every considerable town in the United States and are thus "national," while others operate in certain groups of States or localities. It is probable that at the present time several chains have units numbering upward of 1000, while the organization of new stores is going on very rapidly. Of late years, there has been a tendency for the larger chain organizations to go into the wholesaling, and in some cases into the manufacturing business, thus creating an unbroken series of distributive units extending from producer straight through to consumer. Simultaneous with this development, there has been a tendency to extend the chain method into a considerable number of new fields. It is best established today in groceries, drugs, cigars and tobacco, and dry goods and clothing, but it is also expanding into the fields of candy, bakeries, restaurants, banking, hotels, and music. In all, 55 different fields are now partly or largely occupied. The total amount of merchandise dispensed by chain stores is variously estimated, but the total turnover is probably not less than \$2,900,000,000 per annum for 51 principal chains.

**Reason for Chain-store Development.** The reason for chain-store development as distinct from individual store growth is variously set forth, but the most important consideration is undoubtedly found in the high cost of retailing and consequent high prices for goods. It is estimated by the best authorities that the individual business man today must set aside about 40 per cent of every dollar which he receives in actual sales to cover his overhead and distributing charges. That is, today, if he is obliged to pay more than 60 cents out of every dollar for the goods he gets, he will be unable to make ends meet in the long run. The chain store was originally an effort to cut the cost of retailing, and by furnishing goods at lower prices to extend the scope of sales and increase the turnover. In accomplishing this object, analysis was first made of the different elements entering into retail prices. They were found to be chiefly (1) cost of goods laid down in the establishment, (2) wages, rent, carrying charges, and depreciation, (3) losses and expense through the extension of credit to customers, (4) cost of delivery, and (5) advertising. Most chain stores have worked on the idea of eliminating so far as possible all of these charges beyond the original cost of goods except a minimum personnel and rent charge. The wage item it has been endeavored to hold to the lowest possible figure by reducing the operations of the store to a routine basis, more or less easily covered by standard instructions, and thus eliminating the necessity of very high-cost personnel at the various units.

In these ways, it has been hoped to give chain stores a competitive advantage over retail stores conducted and owned by an individual or local

corporation and hence to enable the elimination of these units by the pressure of competition.

**Success of Chain Store.** In the beginning of the movement, and particularly during the years of early and rapid development after 1900, chain stores adhered quite closely to their original principles. They sold comparatively few articles, but they sold them for cash and insisted that the buyers take them away on the "cash-and-carry" plan. They rarely, if ever, extended credit, and since the articles which they retailed were for the most part not very perishable, their losses were small. The profit per unit of goods sold was small, but large turnover was relied on to make up for such limitation of the margin of earnings. In this way prices were set at figures sometimes as much as 20 per cent lower than those charged at independent establishments.

As time has gone on, the pressure to extend credit and make delivery has been strong, and some chains now set themselves forth as furnishing both types of accommodation, although others adhere to the earlier plan. As they have successively added the older elements of service which led to high cost, their costs have accordingly tended to approximate those of the independent store. An investigation carefully made in the spring of 1920 embracing a large number of stores in New York City showed only a small margin of price advantage in favor of chain stores, as compared with independent establishments. However, the number of chain stores has tended to increase with great rapidity, so that in many towns in the West and South, they have entirely superseded other stores in the grocery and cigar business, and have made decided inroads into the field in other lines. So successful have they been, that the chain store movement has now spread to other countries, and has taken some root in Great Britain and Ireland, Germany, and other continental countries.

**Study of Retailing.** The chain store has, however, obtained a very decided permanent advantage over the retail establishment, in the fact that it has made a careful comparative study of retailing and distributing costs which it is able to standardize and keep up to date. By standardizing commodities, it has succeeded in putting upon the markets products which are recognized as of satisfactory quality, but which can be produced much more cheaply than could the multifarious competing products which were originally sold by independent establishments. "Private brands" also have been used to advantage in place of patented articles. By producing these articles on the large scale, it has been found practicable to eliminate many items of competitive expense and actually to bring the goods to the consumer at a very much narrower cost than formerly. Since in many cases the independent storekeeper has been able to take advantage of these generally lowered costs for standardized articles, he has in turn been able to compete and to remain in business, while the consumer has profited from the lower prices all around. The chain store, however, has naturally retained its advance, or "lead," and in many communities is recognized as setting the pace for the independent establishments. Its great advantage thus comes from constant careful analysis of retail expenses and of changing popular tastes, as well as, it should be added, from its ability to create new demands

and tastes by offering the consumer articles which he prefers to those to which he has been accustomed or items that lead him to broaden his consumption in a way that otherwise would not have been expected.

The chain store also has made great advances in studying the psychology of window display, attractive arrangement of interiors, adoption of standard sanitary and convenient equipment, and general improvement of appearance. By adherence to a one-price policy and maintenance of standard qualities, the chain store has, moreover, been able to increase the confidence of the consumer in the goods that he buys and in the character of his relations with the manager of the establishment. There has been little if any effort to avoid competition between chains, and in most American cities decided inter-chain competition is observable, with the result that such gains as have been extended to the consumer are generally retained by him through competition, even after an old chain, first established in a locality, has succeeded in taking away much of the trade that formerly went to individual establishments.

**Analysis of Selling Costs.** Considerable difference of opinion and practice has existed among chain store managers as to policies to be pursued in paying employees, and these differences have led to experimentation as to selling costs, rates of turnover, and the like. It is undoubtedly true that some classes of chain stores, such as the 5- and 10-cent stores, have been desirous of employing the very cheapest grade of labor. Within recent years conditions have materially altered, and today it is recognized that efficient selling methods and capacity on the part of employees tend strongly to build up profits. In chain stores at the present time, three main methods of compensation are adopted (1) flat salary, (2) salary and commission or bonus, and (3) salary accompanied by a percentage of profits, or in some cases ownership of stock. Experience seems to show that the profit-sharing devices are able to pay for themselves, and leave something behind for the owners, through the more active participation of the employee in his work. Analyses of selling costs have been installed in practically all chain stores, and as a result, a standard selling expense divided into a variety of major elements has been established. By this method, the reports of the various units in the chains have been tested, and when excessive selling cost is noted, investigation is made for the purpose of seeing what may be the cause of it. Executive managers receive fairly large remuneration, while unit managers are paid about as much as they would receive if they were working independently, operating stores for themselves.

**Finance of Chain Stores.** The financing of the chain store is interesting as throwing light upon important sources of saving. All well-managed chain stores take the discounts for cash which are allowed by manufacturers of goods and in this way are able to save a substantial percentage of the sums which were formerly paid out by individual establishments which took the longest possible credit and then endeavored to reimburse themselves by adding the expense to prices. For the most part, the larger chains have begun on a small scale with capital belonging to the promoter or organizer and with very few stores. Later units were then financed out of the profits of the older stores. In a recent

year, the capital required per store by the Atlantic & Pacific Co. was stated as only \$4300, while Woolworth required \$43,918 and Childs Restaurant \$185,000 per store.

Chain stores have now become so well established that the best of them are recognized as substantial investments and are quoted on the stock exchanges of the country. They thus have no difficulty in financing themselves by the offering of new stock through banking houses whenever they desire to expand and are able to show satisfactory profits. Early in the year 1929, one or more investment trusts having as their object the purchase of stock in chain-store companies were organized, and at last accounts were doing a profitable business. The current or short-term financing of the chain store presents comparatively few difficulties and the methods employed there represent one of the principal advantages which the system has enjoyed as compared with the independent store system. Since the central office is usually located in proximity to large and well-equipped banking establishments, it usually has no difficulty in obtaining all of the accommodation to which it is entitled. Centralized methods of buying and economies in shipping enable it to finance its operations on the most economical basis, with the result that the amount of borrowing necessary is reduced. In those chains which adhere to the original cash-and-carry plan, and which regularly remit their takings to the head office, the extent of dependence on banks is naturally small.

In these circumstances, chain stores have been able to show very satisfactory earnings, reports varying from about 30 per cent in one chain during a recent year to a fraction over 7 per cent during the same year by one of the smaller and less well-known chains. Average earnings on capital for ten or twelve of the best-known enterprises vary between 15 and 20 per cent.

**Bibliography.** The literature on chain stores is very extensive, but among recent books on the subject may be mentioned W. J. Baxter, *Chain Store Distribution and Management* (New York 1928); and Hayward and White, *Chain Stores* (New York 1922).

**CHALIAPINE, FEODOR IVANOVITCH** (1873- ). A Russian dramatic bass, born at Kazan. Without any preliminary musical training, he became, in 1890, a member of the chorus of a traveling light opera company, whose director immediately was struck by the exceptional beauty and power of his voice and soon entrusted him with leading rôles. In 1892-93, he studied systematically with Usatov in Tiflis, and during the summer season of 1894 he made his début in grand opera at the Maryinsky Theatre in Petrograd, where he remained two years. In 1896, he joined Mamontov's Private Opera in Moscow, whence his reputation, especially as an unsurpassed interpreter of Russian national types, rapidly spread all over Europe. His first appearances at the Metropolitan Opera House, New York (1907-08) did not arouse unusual enthusiasm, probably because he had no opportunity of singing his famous Russian rôles, but when, on his second visit, he appeared as Boris Godunov (Dec. 9, 1921), his success was overwhelming. Likewise, his recitals drew capacity houses. Later, he became an annual visitor, dividing his time between the Metropolitan Opera House and the Chicago Civic Opera Company. Consult his autobiography, *Pages de ma Vie* (Paris, 1927).

**CHAMBERLAIN, THE RT. HON. (ARTHUR) NEVILLE** (1869- ). A British government official, brother of Sir Austen Chamberlain (q.v.). He was educated at Rugby and Mason College, Birmingham, and in the latter city was a member of the city council and chairman of the town planning committee (1911), an alderman (1914), Lord Mayor (1915-16), and a Unionist representative of its Ladywood division in Parliament (1918- ). In national politics, he was a member of the Central Control Board (1915), Director General of National Service (1916-17), and Postmaster General (1922-23). In 1923 he was successively Paymaster General, Minister of Health, and Chancellor of the Exchequer, holding the latter office until the advent of Labor to power in January, 1924. With the fall of Labor, he became Minister of Health (November, 1924) in the ministry which was headed by Stanley Baldwin. In 1922 he had been made a Privy Councillor.

**CHAMBERLAIN, CLARK WELLS** (1870- ). An American physicist, born at Litchfield, Ohio. He was graduated at Denison in 1894 and then studied as a fellow at Chicago, and at Columbia. In 1900-01 he was professor of physics and astronomy at Colby, then held the chair of physics at Denison (1901-08), and a similar chair at Vassar (1908-13). He was then called to the presidency of Denison, where he remained until 1925. He was with the Cavendish Laboratory of Cambridge University, 1925-27, and became associate professor of physics at Michigan State College in 1927. His original investigations have included studies on the radius of molecular attraction, achromatization of interference, and the relative motion of the earth and ether; he devised a compound interferometer, a diffractometer, and a spectroscopic of high resolving power.

**CHAMBERLAIN, GEORGE EARLE** (1854-1928). An American lawyer and public official (see Vol. V). He was reelected to the United States Senate from Oregon for the term of 1915-21, and was the author of the Chamberlain Military Preparedness Bill of 1918. He was, by appointment of President Harding, a member of the United States Shipping Board from 1921 to 1923, when he resigned. He then practiced law at Portland, Oreg., and Washington, D. C., and was engaged in several important Constitutional cases. Among these was the one involving the Oregon School of Law in reference to religion, argued before the United States Supreme Court, in which case Senator Chamberlain represented the State of Oregon.

**CHAMBERLAIN, HOUSTON STEWART** (1855-1927). A German writer (see Vol. V). Since 1914, his works include: *Lebenswege meines Denkens* (1919); *Mensch und Gott*; *Betrachtungen über Religion und Christentum* (1921).

**CHAMBERLAIN, JOHN LOOMIS** (1858- ). An American army officer, born in New York. He was graduated at the United States Military Academy in 1880, entered the Army as second lieutenant in the 1st Artillery, and continued in the military service until his retirement in 1921 as a major general. He served in the Spanish-American War of 1898-99 as chief ordnance officer with the rank of major of volunteers; in the campaign against the Sioux Indians in 1900-01; in the campaign against the Moros in the Philippines in 1903; and, after his transfer to the Inspector General's Department, continued in the service until his

appointment in 1917 as Inspector General, in which capacity he served during the World War, inspecting the American Expeditionary Forces in France in 1918. For "exceptional meritorious service," he received the Distinguished Service Medal. General Chamberlain was a graduate of the Artillery School in 1890 and of the Army War College in 1913, and was military attaché to Austria in 1897-98.

**CHAMBERLAIN, THE RT. HON. SIR (JOSEPH) AUSTEN (1863- )**. A British statesman (see VOL. V), son of Joseph Chamberlain. In the Coalition government after the outbreak of the World War, he was Secretary of State for India. Because of criticism of the lack of medical preparation for the advance on Baghdad, he resigned in 1917, although he knew nothing about the matter until too late for it to be remedied. He again took office in 1918 under Lloyd George as minister without portfolio, and later was appointed Chancellor of the Exchequer, a position he had previously held 1903-06. The budget he introduced in 1919 reduced by one-sixth the duties on articles from the colonies, thus making the principle of Imperial Preference, which had been in his father's programme fifteen years before, a regular part of the British financial system. By increasing the excess profits duty to 60 per cent, and introducing a corporation tax, he was able to balance the budget in his second year and to make a large payment on the national debt. When Mr. Bonar Law resigned the Unionist leadership on Mar. 17, 1921, Mr. Chamberlain was unanimously chosen leader of the party. He became leader of the House of Commons and Lord Privy Seal (1921-22). From November, 1924, he was Secretary of State for Foreign Affairs. He was a prime mover and a signatory of the Locarno treaties (1925). He was vitally interested in the League of Nations, and attended its sessions as head of the British delegation; but the Empire league was his first thought and his basic policy was to foster trade and add to its prosperity. In 1926 he was awarded the Nobel Peace Prize jointly with General Charles G. Dawes, at that time Vice President of the United States.

**CHAMBERLIN, THOMAS CHROWDER (1843-1928)**. An American geologist (see VOL. V). From 1898 to 1914, he was president of the Chicago Academy of Sciences. His later books include *The Origin of the Earth* (1910). He was for many years editor of the *Journal of Geology*. From 1919 to his death in 1928, he was emeritus professor of geology in the University of Chicago.

**CHAMBER MUSIC**. See MUSIC, under *Chamber Music*.

**CHAMBERS, SIR EDMUND KERCHEVER (1866- )**. An English scholar and educator (see VOL. V). His later works include *Shakespeare: A Survey* (1925) and *Arthur of Britain* (1927). He was made a Knight Commander of the Order of the British Empire in 1925.

**CHAMBERS, EDWARD (1859-1927)**. An American railway official, born in Waukegan, Ill. He began his railway service with the Atchison, Topeka & Santa Fé Railroad in 1878, and served in many important capacities with that road. He was assistant freight traffic manager for the coast lines and vice president of the road from 1905 to 1917, when he resigned to become director of transportation of the United States Food Administration and the United States Grain Corporation. He was director of

the Division of Traffic for the Federal Railway Administration from 1918 to 1920, and was also a member of the War Industries Board. He was appointed vice president in charge of traffic for the Atchison, Topeka & Santa Fé Railroad in 1920.

**CHAMBERS, ROBERT WILLIAM (1865- )**. An American author (see VOL. V). His later books include: *The Dark Star* (1915); *The Restless Sea* (1917); *In Secret* (1918); *The Crimson Tide* (1919); *Slayer of Souls* (1920); *Little Red Foot* (1921); *America* (1921); *The Hi-jackers* (1923); *The Girl in Golden Rags* (1924); *The Man They Hanged* (1925); *The Drums of Aulone* (1926); *The Sun Hawk* (1927); *The Rogues' Moon* (1927); and *The Happy Parrot* (1929).

**CHAMBERS, WILL GRANT (1867- )**. An American psychologist born in Westmoreland Co., Pa. He was educated at Lafayette, Clark, and Chicago Universities. After his graduation, he was professor of mathematics in the State normal schools of Pennsylvania and Minnesota. He was professor of education and dean of the School of Education at the University of Pittsburgh, 1909-21, and dean of a similar school at the Pennsylvania State College after 1923. His professional contributions included papers on genetic psychology, the evolution of ideas, memory types, individual differences, and correlation of character traits.

**CHANDLER, WILLIAM HENRY (1878- )**. An American pomologist, born at Butler, Mo. He was graduated from the University of Missouri in 1905 and took postgraduate courses in that institution. Until 1910 he was assistant horticulturist at the University of Missouri, instructor in 1910-11, and assistant professor from 1911 to 1913. From 1913 to 1923 he was professor of pomology at Cornell University, and in 1920-23, vice director of research. Since 1923 he has held the professorship of pomology at the University of California. Professor Chandler wrote on plant tissues and temperature, fruit and fertilizers, pruning, etc. He is the author of *Fruit Growing* (1925).

**CHANNEL ISLANDS**. See GREAT BRITAIN.

**CHANNEL TUNNEL**. See TUNNELS.

**CHANTEPLEURE, shānt'p-lair GŪR (MADAME EDGAR DUSSOP, née JEANNE VIOLET) (1875- )**. A French author, born in Paris, three of whose works were crowned by the French Academy. She is the author of *Ma Conscience en robe rose*, crowned by the Academy (1896); *Le Château de la Vieillesse* (1900); *Fiancée d'avril*, crowned by the Academy (1900); *Mon Ami Poiseau bleu* (1900); *Les Ruines en fleurs* (1901); *Ames féminines* (1902); *Le Sphinx blanc* (1903); *L'Aventure d'Huguette* (1904); *Le Théâtre de la Primevère* (1905); *Le Baiser au clair de lune* (1908); *La Folle histoire de Fridoline* (1908); *Malencontre* (1910); *La Passagère* (1911); *Le Hasard et l'Amour* (1911); and *La Ville asségée*. *Jamnia*, octobre, 1912-mars, 1913, crowned by the Academy, (1913).

**CHAPLIN, CHARLES SPENCER (1889- )**. A leading comedian on the motion-picture stage. He was born in London, England, and after varied experience in the theatre, made his début as a film performer in the United States in 1914, where he soon became the most familiar figure in screen productions. He starred in many pieces of his own creation, including *The Kid*



(1920-21), which was highly popular with all classes. In 1921 he visited Europe where he received a popular welcome almost without precedent. He established a motion-picture plant at Hollywood, Calif., where he has produced many popular screen comedies.

**CHAPMAN, CHARLES EDWARD** (1880 ). An American historian, born at Franklin, N. H., and educated at Princeton University, Tufts College, Harvard University, and at the Universities of California and Seville (Spain). He was admitted to the bar in 1906, and thereafter was connected with the United Railways Company, San Francisco, and with the Western Electric Company, until 1909, when he became a teacher of history, first in the Riverside (Calif.) High School and afterwards in the University of California. He was made associate professor of history in the University of California in 1919 and professor in 1927. His works include: *The Founding of Spanish California* (1916); *A Californian in South America* (1917); *A History of Spain* (1918); *A Catalogue of Materials in the "Archivo general de Indias" for the History of the Pacific Coast and the American Southwest* (1919); *A History of California; the Spanish Period* (1921); and *A History of the Cuban Republic* (1927).

**CHAPMAN, CHARLES SHEPARD** (1879- ). An American artist born at Morristown, N. Y., who studied with Chase and W. Appleton Clark. He was elected Associate Member of the National Academy in 1919. Among his awards were the Saltus Gold Medal from the National Academy in 1917, the Carnegie Prize from the Academy in 1921, and the second Altman Prize, N. A. D. (1926). Chapman's work as a painter and illustrator has been on exhibition in various parts of the country and one of his best known canvases, "In the Deep Woods," is in the Metropolitan Museum, New York.

**CHAPMAN, FRANK MICHLER** (1864- ). An American ornithologist (see VOL. V). Besides his activities as curator of ornithology and conductor of zoological explorations for the American Museum of Natural History, Dr. Chapman served in 1917-18 as director of the American Red Cross Bureau of Publications and as commissioner of the American Red Cross to Latin America. He was awarded the first Elliot Medal by the National Academy of Sciences in 1918 and was president of the Burroughs Memorial Association in 1921-25. In 1928 the Roosevelt Medal of Honor was awarded to him. His later publications include *The Travels of Birds* (1916); *The Distribution of Bird-Life in Columbia* (1917); *Our Winter Birds* (1918); *What Bird is That?* (1920); *The Distribution of Bird-Life in Ecuador* (1926).

**CHAPMAN, HERMAN HAUPT** (1874- ). An American forester, born at Cambridge, Mass. He graduated from the University of Minnesota in 1896 and took postgraduate courses at the Yale Forest School. From 1898 to 1903 he was superintendent of the United States Agricultural Experiment Station at Grand Rapids, Minn., and after a year in the United States Forest Service was instructor and assistant professor at the Yale Forestry School from 1906 to 1911 when he became Harriman professor of forest management at Yale. From 1913 to 1924, Professor Chapman was a member of the State Park and Forest Commission of Connecticut. He wrote *Forest Valuation* (1914), *Forest Mensuration* (1921), and *Forest Finance* (1926).

**CHAPMAN, JOHN JAY** (1862- ). An American author (see VOL. V). He is the author of *Homeric Scenes* (verse, 1914); *Memories and Milestones* (1915); *Deutschland über Alles* (1915); *Notes on Religion* (1915); *Greek Genius and Other Essays* (1915); *The Letters of Victor Chapman, with Memoirs* (1917); *Songs and Poems* (1919); *William Lloyd Garrison* (2d ed., revised and enlarged, 1921); *Glance toward Shakespeare* (1922); *Letters and Religion* (1923); and *Dante* (essay and translations, 1927).

**CHARCOT, JEAN MARTIN.** See **PSYCHOLOGY, ABNORMAL; and PSYCHOANALYSIS.**

**CHARDONNE, shâr-dôn, JACQUES** (pseudonym of BLUTELLEAU (1884- ). A French novelist. In his novel *L'Épithalame*, he tried to get away from the subjectivism, the "moi," of many of the psychological novels of the twentieth century, by describing the psychological reactions of a couple. This novel shows some influence of George Eliot's *Middlemarch* and of Tolstoy's *Anna Karenina*. He also wrote *Le chant du bienheureux* (1927).

**CHARITIES.** Recent years have seen profound changes taking place in the concept of charity. Before the World War, charitable organizations were largely concerning themselves with two things: to collect and administer funds for the relief of the needy; and to carry on constant warfare against social injustice. The tasks of social-work agencies were the work of volunteers, or persons who did not see that any special training was needed for their jobs; but since the War, the following changes have manifested themselves:

1. The professionalization of social work. At the present time, there exist as many as 26 schools and colleges for the purpose of training social workers. The result has been a great increase in the professional personnel, and it has been estimated that, from 1915 to 1925, the number of paid social workers in the United States had increased 65 per cent. There were, in 1929, about 25,000 professional social workers.

2. Social case work today is not predicated upon social injustice but upon individual inferiority. Today, there exist a number of persons who are "underprivileged," who cannot make their adjustments to society but need the care, study, and sympathetic aid of the social worker to effect that end. The concern of the earlier case worker was for the economic welfare of the family, for the creation of a minimum budget for actual material needs, etc.; but this "left little place for beauty, for creative joy, for elation of the spirit." Today, the case worker remedies maladjustments by bringing in the psychologist and psychiatrist, or by buying flowers or cheap little prints for the family being served. In other words, social case work has lost sight of the fact that the great reason for dependency today is the insecurity brought in the train of our modern industrial life, and that the average man does not need "creative joy" but protection against unemployment, invalidity, sickness, and premature old age. These, naturally, only the State can give. It is interesting to note that, in the fight being carried on for State programmes of social insurance, the professional social worker is either silent or is in the opposition. For example, at the very time (1929) that New York's governor was urging a State system of old-age pensions, the or-

ganized welfare agency of New York City was complaining that there were not enough institutional beds for old people.

3. The formation of community chests. As a result of the experiences of the War, it was found that funds could be more expeditiously raised, to the satisfaction of the large givers, if but a single drive were made every year. By 1928 there were existing, in 300 communities in the country, these "community chests" for the collection of funds needed for social-service purposes. Among them, they raised in the neighborhood of \$65,000,000 annually. Unfortunately, the chest was depriving charitable giving of its personal interest, was leading to the acceptance of modern business ideas where the only thing that counted was that the drive "should go over the top," and was forcing regimentation in social work in that the participating agencies were being scrutinized from the point of view of per-capita costs.

4. Charitable funds were being increasingly concentrated in foundations. By the end of 1928, there were in existence in the country at least 100 of these with probably one billion dollars in investments among them. Seven of the largest, to wit, the General Education Board (founded 1903), Milbank Fund Association (1905), Russell Sage Foundation (1907), Carnegie Corporation (1911), Rockefeller Foundation (1913), Commonwealth Fund (1918), Laura Spelman Rockefeller Memorial (1918), had combined endowments of one-half billion dollars and annual incomes totaling 28½ millions. These charitable foundations had the following in common: they did not grant charity to individuals; they did not engage in emergency relief; they did not ordinarily contribute to the budgets of welfare societies; they were spending their money in research, education, and health. Increasingly, individual fellows were being taken care of to carry on researches in the social sciences. Some of the money was being spent wisely, some very foolishly indeed. As yet, no adequate examination has been made of the operations of these funds to determine whether the benefactors were right in disposing of their fortunes as they did. From the history of some of these foundations, it would appear that the rich man is finding trouble in disposing of his fortune for the "good of his fellow men."

The bill of American private social work is gigantic today. It has been estimated that the country sees being spent annually as much as two billion dollars on philanthropic activities: In New York City alone, there are 1200 social agencies in operation. The income of social welfare agencies in 19 cities, only one of which had a population of more than one million, amounted in a single year to \$112,780,524. Throughout the country, there are 15,000 welfare institutions (public and private), divided as follows: 4900 general and special hospitals; 3500 prisons, reformatories, etc.; 2700 children's homes; 2100 almshouses; 1300 homes for the aged; 526 mental hospitals; 168 institutions for the feeble-minded and the epileptic; 125 institutions for convalescents and incurables. These institutions minister to approximately six million persons annually.

As a result of the questions brought up by the contemplation of the motives and methods of private philanthropy, people were beginning to point out that the care of dependency was the concern of the State and not of individuals.

Just as the State had proceeded to the aid of dependent children with pensions for their mothers and had put on the statute books laws for the compensation of workmen injured during their work, so it was the business of the State to take care of the sick, the unemployed, the invalided, and the aged. What progress has been made in agitation for new social insurance codes will be found in the articles SOCIAL INSURANCE, OLD-AGE PENSIONS, UNEMPLOYMENT. See also the articles MOTHERS' PENSIONS, JUVENILE COURTS, WORKMEN'S COMPENSATION, MINIMUM WAGE, WOMEN IN INDUSTRY, etc.

**CHARLES I, EMPEROR OF AUSTRIA AND KING OF HUNGARY (1887-1922).** The last of the Hapsburg rulers, successor to the Emperor Francis Joseph, was born at Persenbeug, Aug. 17, 1887, the eldest son of the Archduke Otto. He was little known until after his marriage with Princess Zita of Parma, in 1911. He attended one of the large Viennese boys' schools and spent his military life in distant garrison towns. During the World War, he nominally commanded the army that invaded Rumania. On the death of the Emperor Francis Joseph on Nov. 21, 1916, Charles proclaimed himself supreme war lord, and he and his consort were crowned King and Queen of Hungary in Budapest, December 30. During the War, he addressed a letter to his brother-in-law, Prince Sixte of Bourbon-Parma, in which he supported the claims of France in Alsace-Lorraine, and proposed the restoration of both Belgium and Serbia. Charles disavowed the letter, when it was published, in April, 1918, but it had a disheartening effect on the Central Powers. After the political and military collapse of Austria-Hungary, on Nov. 11, 1918, Charles relinquished the throne of Austria, and two days later that of Hungary. In March, 1919, he left Austria to live in Switzerland and in April of that year the Austrian Parliament formally deposed him, annulled all the sovereign rights of the House of Hapsburg, and exiled its members from Austria. Charles made no attempt to regain the Austrian throne, but in March, 1921, and again in October of that year, he escaped from Switzerland to Hungary, where his efforts to regain power were unsuccessful. These attempts made it evident that Switzerland was no longer a safe place for him. A British warship took him and his wife to Madeira where he arrived Nov. 19, 1921. He died there April 1, 1922.

**CHARLES, THE VEN. ROBERT HENRY (1855- ).** A British divine and author (see Vol. V). In 1919 he was made archdeacon of Westminster Abbey. From the same year, he was Warburton Lecturer in Lincoln's Inn Chapel, and Schweich Lecturer in 1919-20. He received the first award of the British Academy's Medal for Biblical Studies. His later works include: *Religious Development Between the Old and New Testaments* (1914); *The Chronicle of John of Nikiu translated from the Ethiopic* (1916); *Sermons Preached in Westminster Abbey* (1917); *The Apocalypse, edited with Text, Translation, and Commentary* (2 vols., 1920); *The Teaching of the New Testament on Divorce* (1921); *Lectures on the Apocalypse* (Schweich Lectures, 1919, 1922); *The Adventure into the Unknown* (2d impression, 1923); *The Decalogue* (Warburton Lectures, 2d impression, 1924); *Gambling and Betting* (2d impression 1925); *Divorce and Nullity* (1927), and *Critical Commentary on the Book of Daniel* (1929).

**CHARNWOOD**, GODFREY RATHBONE BENSON, FIRST BARON (1864- ). An English historian, educated at Balliol College, Oxford. He was a member of Parliament from 1892 to 1895 and Mayor of Litchfield from 1909 to 1911. In the latter year, he was made a baron. In 1916 he published a biography of *Abraham Lincoln* which was very favorably received in the United States. In 1923 he published an interpretative biography of *Theodore Roosevelt*; in 1926, *According to St. John*; and *Tracks in the Snow* (1927).

**CHARTERS**, WERRETT WALLACE (1875- ). An American educator, born at Hartford, Ont., Canada, who was graduated from McMaster University, Toronto, in 1898, and took postgraduate courses at Columbia University and at the University of Chicago. He was professor of the theory of teaching at the University of Missouri, 1907-17, dean of the School of Education there, 1910-17, professor of education at the University of Illinois, 1917-19, and professor of education and director of the research bureau for retail training at the Carnegie Institute of Technology, 1919-23. He had a similar chair at the University of Pittsburgh, 1923-25. Since 1924 he has been professor of education at the University of Chicago. He was the author of *Methods of Teaching* (1910), *Teaching the Common Branches* (1913), *How to Sell at Retail* (1922), and *Curriculum Construction* (1923), and also contributed numerous bulletins and articles to educational journals. He edited many series of educational books.

**CHARTERS FOR CITIES**. See MUNICIPAL GOVERNMENT.

**CHATEAUBRIANT**, shá'tó'bré-án', ALPHONSE DE (1877- ). A French author who was born at Rennes and educated at Nantes. Besides stories for reviews, he wrote only two novels, *Monsieur des Lourdines*, which received the Prix Goncourt for 1911, and *La Brière*, translated as the *Peat Cutters* in 1927, a realistic study of the people and the country of La Brière, which was awarded the Grand Prix du Roman of the French Academy in 1923.

**CHÂTEAU-THIÉRY**. See WORLD WAR.

**CHATTEBTON**, EDWARD KEBLE (1878- ). An English author and journalist (see VOL. V). He entered the Royal Naval Volunteer Reserve as Temporary Lieutenant in 1914 and was promoted to the rank of Acting Lieutenant Commander in 1918. He was in the Auxiliary Patrol Service in command of various ships (1914-17) and was on the staff of the historical section of the Committee for Imperial Defense (1917-21). His later works, which deal mainly with the sea and its life, include: *The Old East Indiamen* (1914); *The Romance of Piracy* (1914); *Q-Ships and their Story* (1922); *The Mercantile Marine* (1923); *Ship Models* (1923); *Seamen All* (1924); *Steamship Models* (1924); *Whalers and Whaling* (1925); *The Ship Under Sail* (1926); *Windjammers and Shellbacks* (1926); *The Brotherhood of the Sea* (1927); *Captain John Smith* (1927); and *Old Sea Paintings* (1928).

**CHATTERTON**, RUTH (1893- ). An American actress born in New York City. She made her stage début in Washington, D. C., in 1909, as Polly Trippett in *Mercy Mary Ann*. She came to New York in 1911 and three years later first played Judy Abbott in *Daddy Long Legs*, a part which made her famous throughout the United States. Other of her well-known

characterizations include: Olivia Dangerfield in *Come out of the Kitchen* (1916); Mrs. Calthorpe in *Perkins* (1918); Comtesse de Candale with Henry Miller in *A Marriage of Convenience*; Judith Baldwin in *Moonlight and Honey-suckle* (1919); Mary Rose in the play of that name (1920). She appeared in *La Tendresse* (translated from the French by herself, 1922); and in *The Changelings* (1923).

**CHAUTAUQUA INSTITUTION**. An organization founded in 1874 at Chautauqua, N. Y., conducting an annual series of lectures and entertainments called the general assembly; a six weeks' summer school; and a home reading circle. By an arrangement made in 1923, the department of education of the summer school is carried on by New York University, and credit given in the University to all students successfully completing the work. In addition to the primary school and kindergarten managed by the Institution, a summer high school was established in 1927. About 45,000 persons attended the general assembly each year between 1924 and 1929; by 1928 there were 19 departments in the summer school, with 125 instructors, and 2500 students.

**CHEESE**. See DAIRYING.

**CHELMSFORD**, chēlmz'fērd, FREDERICK JOHN NAPIER THESIGER, VISCOUNT (1868- ). A British public official who was educated at Oxford. He became a member of the London School Board (1900-04), and of the County Council, 1904-05. He was Governor of Queensland from 1905 to 1909, and of New South Wales from 1909 to 1913. In 1916 he was made Viceroy of India, retiring from that office in 1921 when he was made a viscount. He was a Conservative in politics, and much surprise was felt when he was asked to take the place of First Lord of the Admiralty in Ramsay MacDonald's Labor cabinet early in 1924. He accepted the post, however, as he found himself in accord with the new premier's policies. In 1926-28 he was temporary Agent General in London for New South Wales.

**CHEMICAL WARFARE**. The active beginning of the use of toxic gas in the World War dated from Apr. 22, 1915, when chlorine was released by the Germans in an attack against the French and British lines in the northeastern portion of the upper Ypres salient (see WORLD WAR). This was indeed a momentous step for the Germans, as it introduced into civilized warfare a new weapon which led to new tactics of offense and defense.

The importance of the use of toxic gas in modern warfare is shown by the fact that during the year 1918, from 20 to 33 per cent of all the American battle casualties were due to it, but there was the compensating feature that where armies were supplied with masks and other defensive equipment only about 2 per cent of the gas casualties were fatal as compared with 24 per cent for those wounded by high explosive shells, shrapnel, bullets, etc. By far the greater part of the gas casualties resulted from the gas projectiles fired by field artillery, which in the British Army reached the great total of 180,000. In fact, it was estimated that 90 per cent of the total gas casualties could be thus accounted for, notwithstanding the heavy losses at the first attacks in 1915 among troops quite unprepared when cloud gas was released from cylinders. Trusting to air currents to carry the gas was not satisfactory, and it

was charged into projectiles which could be fired from guns, howitzers, or mortars.

The use of lethal shells began in 1916 and these projectiles charged with deadly gases were used in addition to the lachrymatory gases. The three main killing gases used in chemical warfare were phosgene, diphosgene, and chlorpicrin. Their use made improved masks or respirators essential, and it was a constant contest between developing new toxic gases and finding adequate protection against them.

*Chlorine* was the first gas to be used and after it had been allowed to escape from cylinders, it was found that in its liquid form it could be filled into bombs or drums, which, discharged from crude mortars, would be detonated in the usual way by a fuse and booster charge and small bursting charge of high explosive. Chlorine is a greenish-yellow gas of strong suffocating odor which commercially is used for bleaching and purification of water supplies. By cold and pressure, it is liquefied for storage and transport. At Ypres, the Germans permitted this gas to float out, but they were insufficiently supplied with it, and also without means of protecting themselves so that they were afraid to advance through it.

*Phosgene*, a gas formed by the combination of chlorine and carbon monoxide in the presence of a catalyzer, is a colorless gas that liquefies at 8° C. It was one of the deadliest gases used during the War and was employed not merely to annoy or to compel the wearing of masks but to kill as many as possible. It was often used in an attack as it did not persist long in the air or on the ground after the explosion of the shell, and as a result it would clear away by the time that the oncoming troops reached the place of gas concentration.

*Chlorpicrin*, a liquid that is an active poison and, in addition, a lachrymator or tear producer, is made by the reaction between picric acid or calcium picrate and chlorine. It is a colorless liquid that boils at a temperature of approximately 112° C. and the gas while not so poisonous as some of the toxic gases nevertheless was quite efficient. This, after chlorine, was the first war gas to be made on a large scale in the United States.

*Mustard Gas*, *Dichlorodiethyl Sulphide*, was introduced by the Germans in July, 1917, at Ypres and immediately became a most effective agent in gas warfare. It also proved a boomerang for the Germans, as they never were able to improve their original facilities for manufacture which could not produce more than 6 tons per day at the end of the War. At that time, France and England had improved methods and quantity production, while the United States had 10 times the German capacity at the time of the Armistice. This gas, it is interesting to note, was prepared by the Germans by the method originally described by Victor Meyer and later developed in Emil Fischer's laboratory. Mustard gas is a colorless, slightly oily liquid boiling at 220° C. with some decomposition and freezing at 14° C. or below, the former temperature applying to the pure liquid. Mustard gas was not necessarily fatal except in sufficient amounts and it acted on the skin like a deep burn. It attacked the lungs, the eyes, the skin, and even the intestines. It blistered the skin and produced nausea, thus requiring the removal of the mask. It had a delayed action and often a man might be gassed even fatally

before he was aware of it, and then he was beyond the reach of treatment. Ground soaked with mustard gas remains impregnated for days continually giving off the vapor.

*Diphosgene*, or superpalite, perchloromethyl formate, was extensively employed by the Germans as was *diphenylchlorarsine*, their blue-cross gas, which produced sneezing and a disagreeable temporary sickness. The latter gas was not considered by the Allies very efficient though made by the Germans in large amounts. *Diphenylcyanarsine* and *ethyl dichlorarsine* were also employed by the Germans.

Lachrymatory or tear gases were extensively used during the World War by both sides in order to annoy and cut down the efficiency of the enemy and most of all to compel him to keep masked continually. This form of gassing was cheaper than the use of poison gas and even a trace of tear gas in the air would blind a man temporarily. In fact, a single tear-gas shell could distribute its charge so widely as to require the wearing of masks over an area so wide that from 500 to 1000 phosgene shells would be needed for the same effect. The tear gas was irritating to the membranes of the eye, and so far as it alone was concerned goggles might suffice for protection, but the usual practice was to mix it with deadlier gases. Most tear gases had chlorine or bromine as a base, the bromine being derived from subterranean brines, and the gas could be used alone, but such combinations as brombenzyl cyanide were made, the one specified being extensively produced in the United States.

In addition to the gases mentioned, others were employed and new toxic materials were developed during the War by organic and physiological chemists. Much was accomplished that was never revealed, and had the War continued another year the annihilation of the Central Powers by the discharge from aircraft of deadly gases produced in the United States and elsewhere was predicted.

**Gas Masks.** Naturally the use of gas immediately resulted in defensive measures. After the first attack by the Germans in 1915, extemporized masks and impregnated fabric helmets were rapidly developed in England and hurried to the Continent, consisting merely of gauze pads soaked with neutralizing chemicals. Then came masks or helmets of a box respirator type first introduced by the British in August, 1916, where absorbing and neutralizing chemicals purified the air before it was inhaled by the wearer. An essential element of these respirators was the charcoal, which had to be prepared with great care. Gradually, the British and the Americans developed double protection masks which were efficient under all conditions. There were also protective suits and gloves to resist mustard gas.

**Tactical Use of Gas.** By 1917 the extensive and effective use of gas led to the development of special tactics both for attack and defense. Shells filled with gas and appropriately painted or striped to indicate the charge were issued along with shrapnel and high explosive. The kind of gas selected was determined by the nature of the plan or the military objective, all carefully considered especially with regard to the target and terrain. For example, in case of an advance, a gas that would disperse readily would be employed, or it might be that lanes would be left for the troops going up to seize

or contest an objective. It must be remembered that while an ordinary high explosive or shrapnel shell exerts its effect immediately after the burst, that of a chemical shell has just begun and may even persist in the case of some of the chemical charges for a week or ten days. Furthermore, a bomb-proof shelter, safe against flying fragments, is no protection against a chemical shell whose fumes can pass around corners or sink into the ground.

The artillery during the War made a distinction between "lethal" and "neutralizing" projectiles and fire and this was the basis of the marking of the shell. The lethal shell is used to produce casualties and was employed against occupied positions for surprise effect, the object being to concentrate the greatest possible number of shells on the target in the smallest time, which should not exceed two or three minutes, as in that time gas masks can be adjusted and no further casualties should develop. In attacks of this kind, phosgene is employed. With neutralizing shells or those filled with chemicals which are persistent and vaporize slowly, a slow searching fire is maintained scattered over the area to be neutralized. In other words, the aim is to develop an atmosphere intolerable for unprotected troops, so that the artillerist seeks to find lines of communication, camps, rest billets, trench systems, cross roads, battery positions, and in short any point where troops are likely to be concentrated. The aim is to make them wear respirators, thus cutting down their efficiency in using field or machine guns, in construction or supply work or the bringing up of transport. See STRATEGY AND TACTICS.

**Grenades.** The modern grenade is in effect a small explosive shell thrown at the target by the soldier with his good right arm or by means of an attachment (tromblon) fastened to the muzzle of his rifle. The so-called defensive grenade consisted of a gray-iron casting, the grenade body, which contained an explosive charge of nitrostarch and a suitable firing mechanism designed to prevent explosions until the thrown grenade was a safe distance from the thrower. The defensive grenade was intended to burst into fragments and was used only by men actually within the trenches, the walls of which would protect the thrower from flying fragments. This fragmentation type of grenade was the most used and the most useful of all developed during the War. An American contribution to trench warfare was the offensive grenade, the body of which was made of paper which produced its deadly effect by the flame or concussion of the explosive itself. This type was safe to use in open offensive movements since there were no fragments of metal to fly back and injure the thrower. Gas grenades, the bodies of which consisted of two sheet-metal cups welded so as to be gas-tight, were under development and were used principally to make the enemy trenches and dugouts uninhabitable on release of their toxic contents.

Phosphorus grenades, of construction similar to the gas type, were used to scatter burning phosphorus over an area 10 to 15 feet across. The dense cloud of white smoke thus produced was utilized to build smoke screens for the protection of troops in open attack on machine-gun nests. Incendiary grenades were essentially paper bombs filled with highly inflammable material and intended for use in destroying struc-

tures by fire. In still another class was the Thermit grenade, consisting of aterne-plate container filled with Thermit, a patented composition which developed an intense heat while melting. These grenades found their principal use in destroying captured guns which could not be moved, by fusing the breach mechanism to an extent preventing further use. A combination mount and rifle grenade also was developed by the British and later adopted by the United States Army. The great majority of rifle grenades were of the French Viven-Bessière type, provided with a hole extending entirely through the middle of the grenade. In order to use this grenade, a specially designed holder is fitted to the muzzle of an ordinary service rifle. When the rifle is fired, the bullet passes through the hole in the grenade and the discharged gases following the bullet have enough energy left to throw the grenade approximately 200 yards. The rifle grenade was used both as a defensive and an offensive weapon, since the firers were well out of range of the exploding missile, which had an effective radius of nearly 75 yards on burst.

**CHEMISTRY.** In chemistry, the years following the outbreak of the World War formed a period whose most characteristic feature has been turmoil and upheaval in what seemed the very foundations of the science. In many fields, however, the new data have already been assimilated and the science has won through to clear, definite, and more inclusive concepts to take the place of those which had proven inadequate. Periods of great activity in any science generally follow and have their roots in the discovery of new facts or of new methods of investigation. The great activity in the investigation and development of fundamental chemical theory, which, slackened by the World War, burst forth with all the greater volume with the peace, traces back very largely to the discovery of two methods of investigation in the years just before the War. These are the positive ray analysis of Sir J. J. Thomson and Aston, and the X-ray analysis of crystal structure developed by Laue and by W. H. and W. L. Bragg.

**Isotopes.** There is no principle in chemistry more fundamental than that of the constancy of combining weights. Thus, 35.458 grams of chlorine, no more, no less, combine with 107.880 grams of silver. There can be no quantitative analysis, no quantitative relations whatsoever in chemistry without this constancy. An analyst who determines the proportion of chlorine in a material does not do so by converting the combined chlorine to elementary chlorine and weighing it, which is difficult or even impossible. He converts the chlorine to silver chloride by known simple methods, weighs the silver chloride, and calculates the proportion of the chlorine in the original material by assuming that the proportion of chlorine in silver chloride is always

$$35.458$$

$$107.880 \div 35.458$$

From the time of Dalton until quite recently, there had seemed to be but one possible interpretation of the constancy of combining weights. According to this, the weights of the atoms of chlorine and silver are in the proportion of 35.458 to 107.880, one atom of chlorine combines with one atom of silver when silver chloride is formed, and all atoms of chlorine have the same weight. Yet there is now convincing evidence that this constancy in combining



weight is due not to a constancy in weight of the atoms of chlorine but to the existence in constant proportions of two kinds of chlorine atoms of atomic weights 35 and 37, respectively. The experimental fact of constancy in combining weight remains, but the theoretical interpretation of constant weight of the atoms of a given element proves incorrect. There could be no better example of the way in which ideas, which seem inseparably bound up with certain facts, can be replaced by entirely new and contrary ideas without any controversion of the facts.

The first evidence in this direction came from the study of radioactive elements. Soddy suggested in 1911 that lead produced as the end product in radioactive change might be chemically identical with ordinary lead yet differ in atomic weight and predicted specifically that lead produced in the uranium radium series of radioactive changes should have a lower, lead produced in the thorium series should have a higher, atomic weight than ordinary lead. Experiments carried out by himself and by others—notably Richards of Harvard, the leading exponent of precise atomic weight determination—proved that these predictions were indeed true. In spite of the differences in combining proportions, the three kinds of lead were all lead, identical with each other in all the properties by which the identity of a substance is determined and incapable of separation by ordinary chemical methods, no matter how refined or how persistent the work. A single element such as lead can then exist in varieties, which differ only in atomic mass and derived properties. Such varieties of a single element are called its isotopes.

Proof of the existence of isotopes among non-radioactive elements became possible through Sir J. J. Thomson's invention and through Aston's extensive development and application of a new and ingenious method of determining the weights of atoms, the method of positive ray analysis. When an electrical discharge passes through a gas at low pressure, the molecules present are disrupted. Many of the fragments, including the atoms of the elements present, are electrically charged and are set in motion by the electric field present. Since a beam of atoms thus produced leaves a trace on a photographic plate, it is possible to study the extent to which these atoms are deflected from a straight course by electrical and magnetic fields at right angles to their path. Other things being equal, a heavy atom is less deflected than a light one and the masses of all the atoms present in a given gas can be determined from such deflections. Such measurements give true atomic masses and, when isotopes of a single element are present, each produces its own effect dependent upon its mass, whereas the combining weight gives an average of the atomic weights of the isotopes. In 1913 Sir J. J. Thomson showed in this way that the element neon is composed of two varieties of atoms of atomic weights 20 and 22. Aston took up the work later and in 1920 there appeared the first of a long series of publications from which it is now known that many elements are mixtures of isotopes in constant proportion.

The constancy of the proportions of the isotopes of a given element is a most striking result and one whose cause is still obscure. Except for the radioactive elements, including those varieties of lead which are believed to have been

formed by radioactive decomposition, the utmost exertions have failed to show the slightest difference in the combining weights of different samples of elements which are known with certainty to be composed of two or more isotopes. Thus, Baxter and Parsons in 1922 compared carefully the atomic weight of nickel of terrestrial origin with that of nickel from a meteorite of extra-terrestrial origin and found no detectable difference. Similar studies have since been made on other elements. The conclusion is inescapable that, whatever the process by which the elements are formed, and no one doubts that they are composed of the same fundamental stuff, the process of formation, both on this earth and in whatever part of the universe is the source of the meteorites, produces the isotopes of a given element in a constant proportion.

**The Unitary Concept of Matter.** The same measurements of Aston's have given great support to the unitary concept of the nature of matter. He finds, namely, that the true weights of the atoms are whole-number multiples or very nearly so of a number which is almost the same as the atomic weight of hydrogen, the element with the lightest atoms. The old hypothesis of Prout, that all of the elements are built up from hydrogen, founded on the existence of many elements whose atomic weights are not even approximately whole-number multiples of the weight of the hydrogen atom. But if chlorine consists of two kinds of atoms with weights of 35 and 37, instead of one kind with an atomic weight of 35.458, this idea becomes rejuvenated, especially since relativity theory can account fully for such discrepancies from the whole-number rule as remain. It is now clear that all matter must be built up from the same fundamental stuff, and that transmutation of the elements is theoretically possible. Actually, however, transmutation has been realized only in the case of radioactive changes, which man is unable to control even to the extent of modifying the rate of the change, and in the case of certain lighter elements, which Rutherford has shown to be decomposed when their atoms are struck by the high-speed projectiles resulting from the spontaneous decomposition of radioactive atoms.

**Separation of Isotopes.** In spite of the fact that the isotopes of most elements exist in nature in constant proportions, and that without the benign provision of this constancy chemistry as a quantitative science could not exist, the chemist has perversely but characteristically insisted upon trying to separate or even partially to separate complex elements into their constituent isotopes. It has been amply demonstrated that no chemical process and no process of crystallization can accomplish this because of the absolute identity of the properties of isotopes. It is, however, possible to take advantage of the difference in mass, which results in a difference in the rates of gaseous diffusion of isotopes. In this way sufficient separation to produce a measurable change in atomic weight has been obtained at the expense of enormous labor. This demonstration has been carried out by Bronsted and Hevesy at Copenhagen and by Harkins at Chicago.

**The Determination of Crystal Structure.** In 1912 Laue in Switzerland proved that X-rays, whose nature had been in doubt, are light, but light of a wave length so small that it is of the same order of magnitude as the distance between

the atoms of crystalline substances. The proof rests upon the fact that X-rays are diffracted by the ordered arrangement in lines and planes of the atoms in a crystal just as visible light is diffracted by the lines of a ruled diffraction grating. The genius of W. H. and W. L. Bragg solved the difficult problem of determining simultaneously the wave length of certain X-rays and the arrangement of the atoms in certain crystals, and it is now possible therefore to use the method of crystal diffraction to determine either the wave length of unknown X-rays or the arrangement of atoms in a crystal of unknown structure.

**The Nature of Salt Crystals.** The very first structure determinations that the Braggs made, that of the chlorides of sodium and potassium, announced the overthrow of an idea which chemists had held complacently ever since there was a molecular theory of chemistry. The result which they obtained was, namely, that the crystal of sodium chloride consists of a three dimensional chessboard of sodium and chlorine atoms. In this, six equivalent chlorine atoms surround each sodium atom, and six equivalent sodium atoms surround each chlorine atom. It is obvious that one black square of a chessboard does not bear a particular relation to any one of the four white squares which surround it. No more does one sodium atom in a sodium chloride crystal show any evidence that it is associated to form a molecule with any one of the six equivalent chlorine atoms which surround it.

The theory that a particular sodium atom is combined with and associated with a particular chlorine atom to form a molecule of sodium chloride was originally developed to explain the properties of gases; it had been extended on the basis of considerable evidence to liquids, but it had been applied to solids simply for the reason that there was no evidence against it. With this evidence of the Braggs, chemists came to the realization that they had really had no evidence for the assumption that molecules exist in solids, and that the new idea is simpler and more satisfactory than the old.

It soon appeared that what is true of sodium and potassium chlorides is true in general of salt-like substances; that magnesium oxide, calcium carbonate, sodium nitrate likewise consist of just such a chessboard arrangement of the metallic part and the acidic part of the salt. All of these truly salt-like compounds share certain other properties. They have high melting and boiling points, and most important of all, they conduct the electric current excellently when they are converted to a liquid either by fusion or by solution in a solvent. In the liquid state then, they are largely composed of ions, that is to say, of electrically charged atoms or groups of atoms.

It was not, therefore, a very bold step to suppose that the crystalline salt is also composed of charged atoms which are held in a rigid structure so that motion and hence electrical conduction is now impossible; that the very forces of cohesion of the crystal depend essentially upon the attraction between the positive and negative charges. Starting in 1920, Born and others at Göttingen made a determined mathematical attack upon this problem and showed that there are no properties of these simple salt crystals which are not in complete agreement with the principle that the forces which hold the crystal together are essentially electrical in nature, and

that the salt crystal is an assemblage of electrically charged ions.

**The Electronic Theory of Chemical Combination.** An electronic theory of chemical combination was first proposed by Helmholtz in 1880 simultaneously with the proposal that electricity is atomic in nature. Helmholtz's idea was this: Faraday's laws of electrolysis prove that electricity reacts by atoms with atoms of matter. Atoms therefore can lose or gain electrical charge only in quantities equal to one or more atoms of electricity.

Interpreted in the light of the later demonstration that atoms of electricity are always negative atoms, called electrons, this means that the reaction between sodium and chlorine consists in the transfer of one electron from each sodium atom to a chlorine atom. This leaves the sodium atoms with unit positive, the chlorine atoms with unit negative charge, and the atoms then cling together because of their charges. The crystal structure investigations show, however, that the sodium and chlorine atoms do not cling together in pairs, but build up a much larger assemblage in which there is alternation of positive and negative charges.

The law of definite proportions becomes in this case a consequence of the atomic nature of electrical charge. It results from the fact that the quantity of electricity which a sodium atom can lose is one electron, which is also just the quantity that one chlorine atom can gain. The crystal will tend toward electrical neutrality as the condition of greatest stability and this results in the presence in it of equal numbers of sodium and chlorine atoms. Therefore, sodium and chlorine will combine in a constant proportion which is the proportion of the weights (or average weights) of the atoms of sodium and chlorine. This makes for an extremely simple and satisfactory interpretation of a great deal of chemistry. Sodium is a characteristic monovalent metal because its atoms contain one loosely held electron, and one only. Chlorine is a reactive monovalent non-metal because its atoms are capable of attaching firmly one and only one extra electron. One magnesium atom combines with two chlorine atoms because magnesium atoms contain two loosely held electrons, and so on.

**Non-Polar Compounds.** The simple and attractive electrical theory of chemical combination never became generally accepted by chemists, in spite of the great interest in it and the extensive efforts to apply it which accompanied the tremendous usefulness of the electron theory in physics. The reason is the complete failure of this theory to account for what are called non-polar compounds. To take a simple example of this very common type of combination, the properties of the hydrogen molecule, which consists of two hydrogen atoms, are quite contrary to this theory. It is at first sight possible to suppose that two hydrogen atoms can exchange an electron so that one becomes positively, the other negatively, charged, and that they then cling together in a molecule; but if this were so, the hydrogen molecule would be an electric dipole; it would be positively charged on one end, negatively charged on the other, and Debye has shown that a substance consisting of molecules possessing this kind of electrical dissymmetry must have certain easily recognized properties. Such a substance, and many actual examples are known, must have a relatively large

dielectric constant, and one which varies markedly with temperature and with frequency. In fact, the value of the electrical moment of a molecule may be calculated from the temperature coefficient of the dielectric constant. Now, gaseous hydrogen lacks these properties completely, and behaves in every way as it should if its molecules are entirely symmetrical electrically. The simple electronic theory fails here and with many other important substances, notably with most of the carbon compounds, which are so important to life.

It seems further to be true that crystals of these non-polar compounds contain the same molecules which exist in the gaseous or liquid states, contrary to the assumption made by some in the first enthusiasm engendered by the Braggs' results.

It is chiefly to G. N. Lewis of the University of California that we owe the recognition of the fact that sodium chloride may be formed by a transfer of charges from sodium to chlorine and a clinging together of the charged atoms thus produced, and that hydrogen may nevertheless be formed by a fusion of the structures of two hydrogen atoms without any transfer of charge, any development of polarity. There seem to be two kinds of chemical combination, the polar typified by sodium chloride, and the non-polar typified by hydrogen. Whether these types merge gradually, so that there are intermediate cases in which at least a partial transfer of charge is accompanied by some fusion; and where, if the two types of combination are mutually exclusive, the line of demarcation is to be drawn, is a subject still much under discussion.

The nature of the non-polar combination of atoms is a problem of great importance, but one which must still be considered far from solution. Chemists have accumulated a vast amount of information and have developed many empirical generalizations, which await a greater synthesis and a harmonizing with the generalizations of the new physics on the structure of atoms. Among such empirical generalizations may be mentioned the far-reaching conclusions of Alfred Werner of Zürich. Werner worked from the assumption that complex ions, that is, groups of atoms bound together and carrying a charge, are held together by the same types of linkage and have the same kind of structure as the neutral molecules of organic chemistry, and derived a set of very general rules about chemical combination. Most of this work was done before 1910, but the full appreciation of its importance was somewhat delayed. That it is appreciated is shown by the Nobel Prize award to Werner in 1913 and by the extensive use made of Werner's conclusions in the speculations of Lewis and of Langmuir.

**Solutions of Electrolytes.** A development of the greatest importance to chemistry and one which is closely related to the newer knowledge of the nature of salt crystals which rose from the discovery of the Braggs is the simplification in the theory of the nature of salt solutions which is generally called the principle of the complete ionization of strong electrolytes.

Acids, bases, and salts form a large and important section of the subject matter of chemistry, both pure and applied. That solutions of these substances contain electrically charged atoms or groups of atoms, called ions, has been generally believed since the foundation of elec-

trochemistry by Faraday in 1835. Only so can one understand such facts as the conduction of electricity by these solutions, the motion of their constituents with the current, and the chemical reactions at the electrode. Thus, the copper in a copper salt solution moves toward the negative electrode when current flows, at the negative electrode copper is deposited, and copper dissolves from the positive electrode if this is copper. The copper acts as if positively charged in its salt solutions, copper metal can be converted to the salt by positive charges, and copper metal can be obtained from the salt solution by neutralizing the positive charge.

Until 1881, however, it was supposed that the concentration of these electrically charged ions is extremely minute. The proposal in this year by the Swedish scientist, Arrhenius, of a method of estimating the concentrations of ions in solution changed this view considerably. According to the conclusions of Arrhenius, which soon won general acceptance, there are many electrolytes, including most salts in aqueous solution, which are quite largely dissociated into ions. These are called strong electrolytes, and it was found that all strong electrolytes of a given valence type have very nearly the same large extent of ionization in solutions of a given concentration. In addition, there are many weak electrolytes, substances of the most widely varying degrees of ionization, some almost strong, some hardly ionized at all. This theory became one of the most important features of the great development of what is called physical chemistry, and furnished the foundation of the knowledge and understanding of the physical properties and of the chemical reactions of solutions of acids, bases, and salts.

The prime reason for the importance of this theory is the principle that the properties of an electrolyte solution are largely the properties of its ions. The theory explains the physical property that all dilute copper-salt solutions have the same blue color and the chemical property that all copper-salt solutions give a black precipitate with hydrogen sulfide upon the basis that both the color and the reaction are properties of copper ion and that all copper-salt solutions contain this ion. There was always the inconsistency, however, that the Arrhenius methods of estimating degree of ionization indicate that a significant proportion of the electrolyte remains unionized, yet exerts no effects upon the properties of the solution. These methods indicate, for instance, that a moderately dilute solution of copper sulfate contains only 40 per cent of its copper in the form of copper ion and 60 per cent as copper sulfate, whereas color and properties in general indicate the presence of copper ions and sulfate ions, but give no evidence for the presence of unionized copper sulfate.

It is only since 1923, however, that the mathematical theory of Debye and Hückel has made it clear that the Arrhenius methods of determining degree of ionization are over simplified; that they neglect certain important effects which are due to the charges on the ions; and that, if these complications are given due consideration, there exists no obstacle to the belief that the ionization of copper sulfate and other strong electrolytes is practically complete. It is a hypothetical extrapolation to say that there is no copper sulfate in a dilute copper-sulfate solution, but it is unquestionably true that there

are no known properties of the solution which necessitate the assumption that copper-sulfate molecules are present, no convincing reason for believing that there is anything in the solution but copper ions and sulfate ions. Out of the discovery of the complexity of the methods of determining degree of ionization, we have developed a great simplification of our views on the nature of electrolyte solutions; and it is a great simplification, not only because of the obvious fact that it is easier to treat of two things, copper ion and sulfate ion, than it is to treat of three things, these ions plus copper sulfate, but because it links up so perfectly with the newer knowledge of salt crystals. In fact, the ready acceptance of the revolutionary idea that molecules of certain electrolytes do not exist in solution is unquestionably closely related to the previous proof of the absence of molecules in crystalline salts.

No discussion of progress in the study of solutions can omit an acknowledgment of the great part in this progress which has been played by the work of G. N. Lewis. All modern investigations of solutions make use of exact thermodynamic methods for which he, more than any other, is responsible.

**Atomic Number.** A great increase in clarity and simplicity in fundamental theory has come with the introduction of the concept of atomic number and the identification of this with a fundamental and measurable property of the structure of the atom. Since Mendeleef, chemists have been interested in such relations of atoms of one kind to those of another as are represented by the periodic table. In particular, there has been much effort to represent the properties of the elements as functions of some sort or another of the atomic weight, for atomic weight is the most obvious and apparently the most characteristic and fundamental property of an element. The essence of the periodic table is indeed the principle of writing down the elements in the order of increasing atomic weight, and the value of the table lies in the fact that when the elements are written in this order there is a periodicity such that similar elements follow each other in an order regulated by definite laws. Rydberg in 1897 suggested, however, that a more fundamental number, by which to describe an element and to which to relate other properties, is obtained if the elements are written down in the order of increasing atomic weight, and a whole number is then assigned to each element in this order. Thus, hydrogen has the atomic number 1, helium 2, lithium 3, beryllium 4, boron 5, carbon 6, and so on. The properties of the elements are more simply and directly related to these atomic numbers than to atomic weights. Thus, the difference in atomic weight between successive elements is variable, sometimes small, sometimes large, whereas the difference in other properties from element to element in this order is about the same, like the whole number progression of the atomic numbers, and regardless of the difference in atomic weight. Atomic number nevertheless remained a somewhat vague concept, for there lacked any direct and simple method of determining it and any picture of the atom which accounted for its importance.

In 1914 Moseley in England supplied the method of determining atomic number and gave a strong indication of its meaning. The results of the Braggs had given not only a method of

determining the structure of crystals but also a method of measuring the wave length of X-rays, and had shown that an element emits an X-ray spectrum when it or its compounds are used as target for electron bombardment in an X-ray tube. Moseley now investigated the relation of these spectra to the nature of the element. He found that X-ray spectra are simple and that the frequency of the radiation increases in a regular way from element to element, the square root of the frequency being linearly related to the atomic number. In particular, the order of X-ray frequencies is the order of the chemical properties in the case of cobalt and nickel, where the order of chemical properties and atomic weights do not coincide. This one discovery gave a direct means of determining quantitatively the atomic number of an element, by determining the frequencies of its X-ray spectrum, and demonstrated conclusively that atomic number represents some fundamental property of the atom, rather than a chance order of arrangement. This fundamental quantity, Moseley said, can only be the charge on the central positive nucleus.

Moseley, to whom science owes these discoveries, was killed in the fighting at Gallipoli in his twenty-eighth year, "the youngest investigator surely to have won so secure a place in the history of science," says Soddy.

**The Bohr Theory.** Moseley's interpretation of atomic number as nuclear charge depended upon the Rutherford-Bohr atomic structure theory. Rutherford had been led by complicated considerations arising from alpha particle scattering experiments to the conclusion that the atom contains of a nucleus of dimensions much smaller than those of the atom, that the nucleus is positively charged, and that it includes practically the whole mass of the atom. Surrounding this nucleus are a number of electrons circulating in orbits which make up the greater part of the volume of the atom. Bohr attempted to treat the problem of stability of such a planetary structure by methods which make use of the quantum theory of radiation. His results have had marvelous success in the explanation of the physical properties of isolated atoms, that is, of the properties of elementary substances in the state of monoatomic gases at low pressures; and in the explanation of properties of atoms which, like X-ray emission and absorption, are little affected by chemical combination, and which are believed to depend upon interior portions of the atomic structure.

Moseley saw that the application of these methods of Bohr to the relation between X-ray frequency and nuclear charge must lead to just such a result as that which he had found for the relation between X-ray frequencies and atomic numbers. He was thus led to his conclusion that the physical meaning of atomic number is the number of unit or elementary positive charges on the nucleus.

**The Nuclear Theory of Atomic Structure.** These two principles, that the atom consists of a small positively charged nucleus surrounded by a number of electrons equal to the number of unit positive charges on the nucleus, and that the number of such unit positive charges is equal to the atomic number, have become foundation stones of physics and chemistry. Much corroborative evidence has appeared, and there are no known facts in conflict with these principles, but the strongest reason for accepting them and

the chief reason for their importance is that they clearly predict that the properties of elementary substances in general may be divided into two classes, those which depend upon the number and arrangement of the extranuclear electrons, and those which depend upon the nucleus. The properties such as melting points, boiling points, solubilities, energies of reaction, reaction velocities, spectra, and so forth, upon which reliance is placed for the identification of elements and their compounds, depend only upon the number, arrangement, and firmness of attachment of the extranuclear electrons. The forces controlling these properties of the exterior of the atom are purely electrical, and depend only upon the charge of the nucleus, and not at all upon its mass. Granted that nuclei can be identical in charge but different in mass, the existence of isotopes becomes immediately explicable. Furthermore, the close and regular relation between chemical and physical properties and atomic number receives a sound foundation, for these properties depend upon nuclear charge which is atomic number. That there is an approximate relationship between nuclear charge and nuclear mass appears, however, from the fact that the periodic table could have been developed in terms of atomic weights.

**The Discovery of New Elements.** Moseley's method of determining atomic number by determining X-ray frequencies can be reversed, and the X-ray frequencies which correspond to any particular atomic number can be calculated from that atomic number. This is particularly important, because it gives a new and most valuable method of searching for a new element. Thus, the element with the atomic number 72 was not known. Bohr predicted from his considerations on atomic structure that this element should resemble zirconium. In 1923 Coster and Hevesy at Copenhagen proved that element 72, which they named hafnium, is indeed present in zirconium minerals, and resembles zirconium closely in its properties. They were able to do this because the X-ray spectrum of this unknown element could be predicted quantitatively by the laws discovered by Moseley, and because no purification or separation is necessary in order to obtain an X-ray spectrum. Similarly Harris, Yntema, and Hopkins of Illinois could use X-ray spectra as corroborative evidence for their discovery of element 61, which they called illinium, and Noddack and Tacke in Germany proved the existence of elements 43 and 75 by X-ray spectra.

**Chemical Valence Theory.** The further development and amplification of the quantum theory of atomic structure at the hands of Bohr and other mathematical physicists is a matter of great interest to the chemist. Bohr has indeed used the rules of chemical valence with considerable success for verification and confirmation of his conclusions derived from quite different evidence. One may hope greatly for the improvement of valence theory from this kind of result, and improvement is needed. Chemical valence theory consists of a series of partial and incomplete generalizations, sometimes mutually contradictory, yet often extremely valuable in limited fields as the organic chemists' valence rules have been in the chemistry of carbon compounds, and as Werner's principles have been in inorganic chemistry. Even in these cases there has lacked any mechanism, any basis for the behavior described by the generalization.

The distinction between polar and non-polar

compounds has brought some clarity to this field, and the nature of extremely polar or salt-like compounds seems well settled. With these, a principle enunciated by Lewis in America and by Kossel in Germany rules. According to this, there is a particular stability about the arrangement and number of electrons in an inert gas atom, and other atoms lose or gain with relative ease a number of electrons necessary to leave them with the electron number of an inert gas atom. The fact that an inert gas forms no stable chemical compounds is to be related to the fact that its structure is of such inherent stability that there is very little tendency either to lose or to gain electrons; sodium is a monovalent metal because the loss of one electron leaves its atom with the same number of electrons as is possessed by the atoms of the inert gas neon; magnesium is a bivalent metal because its atoms contain 12 electrons, and can easily lose two electrons to form a doubly charged ion with the same number of electrons, 10, as the atoms of neon; chlorine is a monovalent non-metal because its atoms contain 17 electrons, whereas 18 electrons represent the stable configuration of the inert gas argon.

The why of the valence relationships in non-polar combination remains unsolved. Much may be hoped for from the further application of the quantum theory to molecules, especially in its newer developments. Yet there is still much to be done in the extension and clarification of the empirical rules of chemical valence. Thus, Stock of Berlin seems to have proven that the substance  $B_2H_4$  is so similar in structure and properties to  $C_2H_4$  that it must be concluded that boron is quadrivalent in the one case if carbon is in the other. Here is a result which is in direct contradiction to all previous chemical rules of valence and to all atomic structure theories yet proposed. That such a discovery could be made at such a late date in the history of chemistry is because of the difficulty of the experimentation and because there has been no indication of commercial usefulness for these compounds. Stock's achievement in separating complex mixtures of poisonous, spontaneously inflammable substances, gaseous at ordinary temperatures, and in purifying, analyzing, and studying the reactions and properties of the constituents of these mixtures marks a great advance in chemical methods. Every such accomplishment as this helps lay the foundation upon which a really complete and inclusive valence theory may some day be built.

**Structural Chemistry.** The development of organic chemistry with its tremendous practical applications has been founded upon the idea that the arrangement of atoms in molecules can be deduced from the chemical reactions of these molecules, and that the arrangement or structure once found can be used as a method of recording and of predicting the properties of a particular substance. The structure of a compound is determined by a study of chemical reactions, it is verified by chemical reactions, and it has been useful chiefly as a means of recording and predicting chemical reactions. To many thoughtful chemists, it has seemed doubtful whether any high degree of physical reality can be assigned to these structures, whether they represent any more than an immensely valuable shorthand or systematics for recording and classifying chemical reactions. The appearance of several methods which do not depend upon



chemical reactions for investigating the spacial arrangement of atoms is therefore especially important. That the results of these methods, in so far as they have been applied, agree completely with the conclusions of structural chemistry means that the basic assumptions of structural chemistry are much broader, more inclusive, and more real than a working hypothesis directed solely toward the end of the elucidation, the recording, and the classification of the reactions of carbon compounds.

Arrangement of atoms in space is exactly what X-ray analysis of crystal structure can determine. Unfortunately, the determination of crystal structure meets with especial difficulty in the case of organic compounds, and only a few such structures have been completely determined. Such results as have been obtained, however, are in agreement with the results of structural organic chemistry; but a considerable number of inorganic complex compounds have had their spacial configurations determined by this method with results which are in entire agreement with Werner's conclusions derived by the application of the fundamental methods of organic structural chemistry to the structure of inorganic complex ions. The verification of these chemically derived structures by this entirely different physical method is a great triumph for the methods of structural chemistry.

As was mentioned in the discussion of non-polar compounds, Debye has shown how the electrical symmetry or dissymmetry of a molecule can be estimated from the dielectric properties of the substances. The application of this method of investigation to the derivatives of benzene by Smyth and others has resulted in a perfect confirmation of the structures of the organic chemist. Compounds which the organic chemist says are symmetrical spacially are symmetrical electrically, compounds which the organic chemist predicts to be polar are found to possess molecules with an electric moment.

**Fields of Research.** There are a number of branches of chemistry which have been the subject of the most extensive investigations since 1914 without any definite or approximately complete answer to the problems concerned having yet been attained. In all periods in the history of science, there have been such active fields in which many new facts are discovered by painstaking research, in which the accumulation of new facts leads constantly to the breaking down of old, and the setting up of new, hypotheses, and the constantly changing hypotheses lead ever to new experiments which lead to the discovery of yet further facts. Through all this, there runs always a steady increase in the known facts and still more in the recognition of the relationships between known facts. Sooner or later, there comes a Faraday, a Pasteur, a Kekulé, or an Arrhenius to clarify the whole field with an idea and some crucial experiments. One cannot, during the heat of the struggle, assay properly the importance of this or that experiment or hypothesis, one certainly cannot predict the direction from which the answer is to be expected, for it is the essence of a difficult problem that the answer is to be found in an unexpected direction. For such fields, then, one can but state the existence of the activity, point out the reason for the interest, and pay due tribute to the value and importance of the efforts of the workers in the field. The study of reaction velocity and catalysis, photochemis-

try, and colloid chemistry can properly be classed under this heading of very active fields of research during the years since 1914.

**Reaction Velocity and Catalysis.** There are two chief aspects of the study of any chemical reaction. One is the question of the position of the equilibrium in the reaction, the question of how nearly complete the reaction will be if it is given unlimited time. The other is the question of the rate at which the reaction proceeds. The first is the problem of chemical statics, the second the problem of chemical dynamics. The ideal of chemical statics will be attained when it is possible to substitute in a mathematical formula certain numbers, say 11 and 17, and a temperature, say 25° centigrade, and to calculate therefrom with certainty the extent to which elements 11 and 17, that is sodium and chlorine, react with each other at 25° centigrade.

We are far from the attainment of this ideal, but we can see progress, we can see many regularities, many indications of the correctness of the methods of attack in use; and the usefulness of the tool of thermodynamics for the purpose is clear. The problem of chemical dynamics, however, the prediction *a priori* of how rapidly a given reaction will go, seems much further from realization. Reaction velocity seems to be a much more haphazard sort of thing, much less amenable to rule and generalization than does the extent of reaction. The substitution of one substance for another similar one in a reaction will, in general, produce a greater effect upon the velocity than upon the extent of a reaction. Furthermore, the velocity but not the extent of a reaction is often greatly affected by the presence of catalysts, substances which take no permanent part in the reaction, and which are present in the reaction products in exactly the same amount as in the reaction mixture.

Aside from its fundamental scientific importance, the problem of reaction velocity and catalysis is of enormous importance in the applications of chemistry. On the one hand, the success or failure of an industrial process depends upon whether the reaction concerned requires 10 seconds, 10 hours, or 10 years, and upon the extent to which a particular reaction can be made to proceed so much more rapidly than other competing reactions as practically to exclude these others. All of these technical problems are to be solved, if at all, by the discovery of catalysts. On the other hand, it becomes constantly more apparent that life processes are dependant upon the elaboration by the living organism of very specific catalysts, and that the study of the nature of such biological catalysts and of their mode of action is one of the most fertile methods of attacking the chemistry of living organisms. We have very much yet to learn about the mechanism of even the simplest chemical reactions, but we are learning.

As for catalysis, the efforts of pure scientists are being supplemented by the rapid discovery by the chemical industries of great quantities of empirical data about the selection and use of catalysts, information which will sooner or later become the common property of science.

**Photochemistry.** The study of the effects of radiation upon the extent and velocity of chemical reactions is called photochemistry. The recent great interest in this has been stimulated in part no doubt by the great success which the quantum theory has had in treating the emission

and absorption of light by atoms and molecules. Specifically, the quantum theory indicates that the subjection of matter to light of high frequency is in many ways analogous to its subjection to a high electric potential or to a high temperature, with the difference that there is at least the possibility that the radiation may be tuned, so to speak, to the particular reaction which is desired to the exclusion of competing reactions.

**Colloid Chemistry and Adsorption.** It was recognized by Graham in 1861 that solutions of starch, gelatine, gums, and such materials differ from ordinary solutions in the very small tendency to diffuse which the former possess. Further, a membrane of parchment or collodion, through which water and many dissolved substances, such as salts and sugar, pass easily, retains starch and other such materials completely or almost so. Solutions whose constituents diffuse very slowly and are retained by parchment or collodion membranes are called colloidal. It also has been found that many substances, such as hydrated ferric oxide and even metallic gold, which are in the ordinary sense insoluble, are capable under special conditions of forming solutions which have these colloidal characteristics.

Colloidal solutions have in general special optical properties. They scatter light strongly so that the path of a beam of light through such a solution is easily visible when viewed at right angles to the direction of the beam, whereas such a path is practically invisible in pure water or in a solution which is not colloidal. When the path of a powerful beam of light through such a solution is viewed by a microscope set at right angles to the beam so that only scattered light enters the microscope objective (this is called an ultramicroscope), individual spots of light are seen and each such spot is interpreted to represent the light diffracted by the individual particles which correspond to the molecules in ordinary solutions.

All these properties, both the optical properties and those relating to diffusion, indicate strongly that these particles are much larger than the molecules of non-colloidal solutions. Colloidal solutions represent, then, a link between ordinary solutions, on the one hand, and coarse suspensions and emulsions, on the other. The ultimate particles are either molecules of much greater size than the molecules of ordinary solutions, or they consist of many molecules of ordinary size united into particles which because of some special conditions of electric charge or combination with other constituents of the solution do not settle out or coalesce.

A closely related question is that of adsorption. There is sufficient theoretical reason to expect the fields of force and other properties of the surface of a solid or liquid particle to be very different from those inside the particle, and sufficient experimental evidence that small particles can attach and hold firmly on their surface molecules of gaseous or dissolved substances with which they come in contact. The relative surface of a material increases with its degree of subdivision, so that a very small particle can be thought of as being almost entirely surface. Adsorption, therefore, should increase as the degree of subdivision increases, and should be, and is, very great with particles which approach the dimensions of colloidal particles. The gross composition of a material composed

of such particles with their adsorbed matter must vary continuously since adsorption does not correspond to the formation of definite compounds, and for such materials the law of definite proportions does not hold. Instead of combining only in certain very definite proportions, an adsorbed material can be held in any proportion whatsoever within wide limits, and the properties of the product vary continuously with the proportion of adsorbed substance.

Colloidal solutions and adsorption have been known to exist for a long time, but activity in the field has been especially great since 1914. Aside from the fact that such border-line subjects are likely to be of particularly great importance in the growth of science, this branch has enormous practical importance. Living organisms are composed largely of colloidal material, and this means that physiology, medicine, and those branches of industrial chemistry which are concerned with the products of living organisms have much to do with colloidal chemistry.

**Organic Chemistry.** The fundamental assumptions of structural organic chemistry and its general methods of procedure have justified their usefulness over a period of so many years that it is hardly unexpected that there have been no extensive or fundamental overturns in these principles or methods in many decades. The support which the fundamental assumptions of structural chemistry have received from other fields has already been mentioned.

The developments of organic chemistry, then, have been either in the direction of refinement and extension of these fundamental principles, work of great importance but work which is of and for the specialist in the field, or they have been applications of the methods and results of organic chemistry. Organic chemistry represents a valuable technique at the service of other branches of science, and incidentally the one highly developed method of scientific reasoning which is not mathematical in nature. It is being used with a large and constantly increasing measure of success in the investigation of the products of living organisms, of proteins, sugars, enzymes, of natural drugs, perfumes, and coloring matters. The year 1928 saw the announcement by Pictet of Switzerland that sucrose, the common sugar of our tables, whether obtained from cane or beet, has finally been synthesized. To the organic chemist, this is a great step forward, for the classical method of organic chemistry with natural products consists first in the isolation of a substance in the pure state and its analysis; second in the derivation of a structural formula by the study of its reactions; and, finally, in its synthesis from simpler material. Without this final step, the problem of the structure is not felt to be solved with certainty; with it, the next thought has often been its possible artificial preparation more cheaply than it can be obtained in nature. The organic chemist has always gone further and prepared new substances different from any known in nature, some of which have become of great value. A constantly increasing list of purely artificial drugs, dyestuffs, and odorous substances testifies to his skill in this direction. See BIOLOGICAL CHEMISTRY; VITAMINS; ZOOLOGY.

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**CHEMISTRY, APPLIED.** The World War focused popular and governmental attention upon a particular part of chemical industry, that of the organic dyestuffs. Before the War, this industry was confined largely to Germany, where support of research by the industry and by the Government had led to great advances. The great shortage, during the early part of the War, in the neutral and allied countries contributed much to the realization of the importance of this industry and of the extent to which dyestuffs and the related pharmaceutical substances interlace with every part of industrial life. Even more effective was the demonstration that an organic chemical industry is an indispensable school for the training of chemists, engineers, and executives for the production of all kinds of materials for war. (See **EXPLOSIVES**.) The existence of such an industry guarantees much of the preparation for that contest of scientific and technical wits which is an important part of modern war. If there is to be any preparation for national defense, if a country is to have armies and navies, the lack of a flourishing chemical industry is as fatal to this preparation as the lack of shipyards or of steel mills. Every great power now possesses such an industry, and protects it by tariff or embargo against foreign competition.

With several great national dyestuff industries existent and a market only slightly greater than that which was supplied by the Germans alone, it is not surprising that the period following the War has been a time of consolidation and of extension of the brains and knowledge of this industry to related fields. In Germany, for instance, practically all the chemical industry of the country is united in the *Interessen Gemeinschaft*, one of the most formidable industrial organizations the world has ever known. In this, however, the importance of heavy chemicals, of synthetic nitrogen compounds and other fertilizers, of products from coal and coal gas, of artificial silk, and of pharmaceuticals outweighs that of dyestuffs. The most significant developments of technical chemistry of the post-war period have been in these other fields both in Germany and elsewhere.

**Heavy Chemicals.** The dyestuff industry was never the greatest chemical industry in point of view of quantity or value of its products. It is the most chemical industry in the sense that it is the one in which continued chemical research has been most necessary and most immediately remunerative. There is hardly an industry, however, which is not to some extent chemical, in which chemical research may not be expected to be profitable.

At the bases of all industries which use chemicals is the heavy chemical industry, which manufactures such substances as sulphuric, nitric, and hydrochloric acids, sodium carbonate, sodium hydroxide, and the other common acids, alkalis, and salts. The chemistry of these processes of manufacture is relatively simple, it has long been known, and revolutionary changes are not to be looked for in every decade. There have been, however, decided trends in the period since 1914. More and more sulphuric acid is made by the contact process instead of by the older chamber process. The contact process produces directly acid of high concentration, and the plant requires much less space.

Transportation is and always has been a great problem with the heavy chemical industry. Many of its products have had to be shipped in fragile glass carboys, with great expense for handling in such small packages, and constant danger of loss from breakage. It represents, therefore, a great advance for the industry that an American company has developed a method of attaching a rubber coating so firmly and permanently to metal that rubber lined tank cars are now in service for the transportation of such corrosive chemicals.

**Nitrogen Fixation.** The greatest change in the heavy chemical industry is the increase in the extent to which supplies of nitrogen compounds are obtained from the nitrogen of the air. Nitrogen is a common element, four-fifths by volume of the air is nitrogen, but the elementary nitrogen of the air is inert and unreactive, and it is extremely difficult to make it enter into combination. Plants must have combined nitrogen, and except for the ability of certain bacteria present in the nodules on the roots of legumes to use the nitrogen of the air, this combined nitrogen must be supplied as fertilizer. Besides the demands for fertilizer, large quantities of nitrogen compounds are required for the manufacture of explosives, almost all of which are nitrogen compounds, of dyestuffs, and of nitrocellulose used for lacquers, for photographic films, and for plastics.

Before processes for the fixation of atmospheric nitrogen, that is, its conversion to some compound, were perfected, the world's supply of nitrogen compounds depended upon green manuring with leguminous plants, upon ammonia obtained from coal gas, and upon the limited and monopolized sodium nitrate of Chile. Several processes for the combination of the nitrogen and oxygen of the air were first developed, followed by the cyanamide process. These require large quantities of electric power, and are only possible when this is cheap.

In 1913 the first industrial plant for the production of ammonia by the direct combination of nitrogen and hydrogen went into operation at Oppau in Germany, and production has increased rapidly in all parts of the world. In this process, whose technical difficulties were first solved by Haber, nitrogen from the air is combined with hydrogen. This is usually obtained by the action of steam on hot coke, the water gas thus formed being subjected to various processes to remove the carbon monoxide and various harmful impurities. The combination takes place at an elevated temperature, which is maintained by the heat of the reaction, so that large expenditures of energy for heating are unnecessary. The pressures used range from 100 to 900 atmospheres, and the engineering difficulties which had

to be overcome in the construction of operating apparatus to withstand these temperatures and pressures were tremendous. The heart of the process is the catalyst, for which suitably prepared metallic iron is generally used. It is in connection with catalysts for ammonia synthesis that the now common term "promoter" was first used. It was found, namely, that the addition of small amounts of certain materials, called promoters, which are not in themselves catalysts, to the iron catalysts greatly increased the effectiveness of the catalysts. It has since been found that such behavior is common with contact catalysts.

In 1927 more than half of the world's consumption of combined nitrogen was satisfied by one or the other of the nitrogen fixation processes. It should be emphasized that combination of some sort is the essential thing. Either ammonia compounds or nitrates can be used as fertilizers, and ammonia mixed with air can be passed over a heated platinum gauze to give nearly quantitative conversion to oxides of nitrogen which can be converted to nitric acid and nitrates.

**The Chemical Utilization of Coal.** Coal is being looked upon more and more as a chemical raw material, less as a mere fuel. Coal is far from being the pure carbon which we often carelessly think it to be. If it is heated out of contact with air, destructive distillation takes place. The process has long been in use for two main purposes. The nearly pure carbon which remains after the distillation is called coke. It is a smokeless fuel, but even more important, it is the usual form of carbon for the reduction of iron oxide to iron in the blast furnace and for other metallurgical purposes. The gaseous products of the distillation after purification have been used for many years as gas for light and fuel. Because gas plants have had to purify their gas before distribution, they have always recovered a number of other products besides gas and coke. Among these are ammonia and coal tar, a complex mixture from which a large number of valuable chemical raw materials have been obtained.

Manufacturers of coke for metallurgical purposes were interested chiefly in the production of a coke of sufficient mechanical strength for blast furnace use, and such coke can be made in a simple apparatus, the beehive oven, in which none of the by-products of the distillation of the coal are saved. Before the World War, satisfactory by-product coke ovens which produced a useful coke, yet saved all the ammonia, tar, and other by-products, and used only part of the gas for heating the ovens, were in use, largely in Europe and to some extent in America. The War with its immense demands for coal-tar products, particularly for toluene for the manufacture of TNT, resulted in a great increase in the use of such ovens, and a decrease in the wasteful beehive oven. See COKE.

When coal is distilled at a temperature much lower than that used in ordinary coke-oven or gas-retort practice, quite different products are obtained. A greater proportion of liquid by-products is obtained and these are of quite different chemical nature from those of the classical coal tar. These low-temperature carbonization processes have excited much interest although none are yet in large-scale commercial operation. The conversion of coal into a liquid fuel with its greater ease of handling is an interesting prob-

lem. This has been attacked by Bergius who subjects coal to treatment with hydrogen for this purpose. The commercial possibilities of this process are being actively studied.

The outstanding achievement since the World War, both in the chemistry of coal products and in the application of catalysis, has been the discovery and successful commercial application of methods of obtaining complex carbon compounds from water gas. Water gas is essentially a mixture of carbon monoxide and hydrogen, which is prepared by passing steam over heated coke. In 1927 the catalytic preparation of methanol or wood alcohol from water gas was announced from Germany and France, and synthetic methanol soon came on the market. This struck a severe blow at the industry of wood distillation. This is an interesting example of the change in emphasis of a chemical process with a complex product. The destructive distillation of wood was first carried out for the sake of the charcoal, and no other product is obtained in primitive methods. It is possible, however, to obtain tar, methanol, and acetic acid, and methanol and acetic acid became the chief object of wood distillation when coke displaced charcoal for most purposes. Then, other methods for obtaining acetic acid appeared. This is now obtained where electric power is cheap from calcium carbide through acetylene and acetaldehyde, and is also prepared by the quick vinegar process from alcohol. Moreover, the acetone whose preparation represented an important use of acetic acid is now made together with butyl alcohol as a direct product of the fermentation of corn. The demand for methanol represented practically the sole reason why wood must be distilled in large quantities, and that compulsion has now disappeared.

From this same water gas, with a different catalyst and under different conditions, Fischer and Tropsch have prepared complex mixtures called synthol with a lower oxygen content and greater calorific value than methanol. These have possible usefulness as motor fuel. The preparation of a volatile motor fuel from coal and water gives mankind another reserve against the exhaustion of the petroleum supply.

**Petroleum and Natural Gas.** Petroleum is another natural product which was originally thought of simply as a fuel to be burned directly or after separation by distillation alone. It is now being more and more treated chemically either to make it more useful as a fuel, which corresponds to the conversion of coal into coke and gas, or used directly as a raw material for the preparation of solvents and other valuable products. Petroleum is a complex mixture composed chiefly of compounds of carbon and hydrogen. These are of varying composition and correspondingly of varying boiling points. For use in motor-car or airplane engines, only the more volatile and easily evaporated components of this mixture can be used. The separation by distillation of the crude petroleum yields gasoline in a volume less than a quarter that of the oil used, and distillation alone can do no more. It has been found, however, that if the higher boiling portions of the petroleum, from which the gasoline originally present has been removed, is subjected to high pressures and temperatures, it is decomposed, "cracked," with the formation of a highly complex mixture of which a considerable portion has the volatility and desirable fuel characteristics of gasoline. This product can be sep-

arated by distillation and the higher boiling material can be again cracked. In this way, it is possible to convert much the larger part of petroleum into gasoline. The first large plant for the manufacture of cracked gasoline started operations in 1913, and the process has been constantly increasing in use, so that in 1925 approximately one-quarter of the gasoline used was cracked. This is an important step in the conservation of fuel supply suitable for the light-weight internal-combustion engine.

Much gasoline also is obtained from natural gas which contains gasoline vapor in much the same way as air may contain water vapor. By compression and cooling, or by adsorption, this vapor may be largely recovered to give a gasoline of relatively high volatility. This has especial value, since it may be blended with gasolines of low volatility to give a mixture of satisfactory properties, thus rendering possible the inclusion of a greater proportion of the petroleum in the gasoline fraction.

**Anti-Knock Gasolines.** The general use of high-compression gasoline engines has been made possible by the study of the chemical properties of gasoline fuels. An internal-combustion engine is more efficient the more highly the fuel air mixture is compressed before the explosion. With gasoline, a limit is set to this increased efficiency by the appearance of knocking or pinking. This is due to violent and rapid combustion, to a detonation which gives a blow, instead of a slow explosion which gives a push, to the piston. Riccardo first showed the importance of knocking and its dependence upon fuel composition. Especially, he found that benzene and similar aromatic hydrocarbons which can be obtained from coal distillation do not knock even at high compressions, and that the addition of sufficient proportions of benzene to petroleum gasoline gave a knockless fuel. The available supplies of benzene, however, are too limited to make this method of suppressing knocking generally available.

Midgely in 1922 found that the addition of a fraction of 1 per cent of lead tetraethyl to gasoline entirely suppresses knocking. Methods of preparing this compound, which had been a laboratory curiosity, were developed on a large scale, and large quantities of gasoline using this substance are being sold. Further study of knocking has shown that what seem at first sight unimportant minutiae of the structure of a hydrocarbon exert enormous effects upon the tendency to knock when this hydrocarbon is used as fuel in an internal combustion engine. Branched-chain compounds have a very different action from straight-chain ones, unsaturated compounds from saturated ones.

The chemistry of these hydrocarbons has therefore become a matter of the greatest practical interest, and is being actively studied. We are no longer satisfied with the fact that all of these compounds burn, we must be interested in the way they burn. This we already know to be a complex chemical problem in which the methods of organic chemical research are of great value. It has already been demonstrated that the process of cracking can be modified to produce a greater proportion of the kind of hydrocarbons which tend to prevent knocking.

**Other Petroleum Products.** The cracking of petroleum produces considerable quantities of gaseous substances which contain ethylene, propylene, and other unsaturated compounds.

From the propylene, isopropyl alcohol is now being prepared on a large scale. This is a useful solvent, particularly because of the legal restrictions on the use of ethyl alcohol. A related product which has come onto the market in large quantities is ethylene glycol. This substance which resembles glycerine is being used as an "anti-freeze" for motor-car radiators, and as a raw material for the preparation of many interesting derivatives. Among these are glycol nitrate, from which low-freezing dynamites can be made, and various ethers which are odorless, high-boiling solvents for lacquers.

**Helium.** Hydrogen and helium are the only possible lifting gases for dirigibles. Hydrogen has the greater lifting power, but helium is non-inflammable and has a lifting power over 90 per cent that of hydrogen. Helium was discovered by Sir William Ramsay in 1895 as an extremely rare element. It is one of the inert gases, and its non-inflammability is simply one aspect of its chemical inertness. During the World War, it was discovered or recollected that certain natural gases contain helium in appreciable proportions. The Texas gas which is now being used for helium isolation contains about 1.75 per cent by volume of this formerly very rare element. Its isolation is simple in principle, although complex in its engineering. Helium has the lowest boiling point of any known gas, and it can be separated from the other constituents of natural gas by liquefaction and fractional distillation. The calorific power of the remaining gas is increased slightly by the removal of this non-inflammable constituent. So far as known at present, the United States is the only country which possesses natural-gas supplies with a helium content sufficiently large to make extraction practicable, and is therefore the only country which can take advantage of the great increase in safety of operation which the use of this gas makes possible for dirigibles.

**Flotation.** There are two decidedly chemical applications in the field of obtaining metals from their ores. Ores usually consist of a complex mixture of minerals, and conversion to the metal consists partly in the separation of these minerals, partly in changing one of these minerals, the true ore, to the metal of which it is a compound. Many methods of separating minerals have been used, but the introduction of flotation has helped to solve many difficult problems. In this process, the finely ground ore is suspended in water to which small amounts of flotation reagents have been added. Agitation and the introduction of streams of air result in the formation of a froth in which certain of the minerals are suspended, each particle attached to a bubble, whereas other minerals sink. The determination of which minerals go into the froth and which sink depends largely upon the nature of the addition agent, and by suitable choice very valuable results have been attained. This is undoubtedly a problem in colloidal chemistry, and in this, as in many applications of colloid chemistry, practice still outruns theory.

**Electrochemistry.** Electrochemistry has made great advances in the obtaining of metals by electrolytic processes or in the purification of metals by electrolytic means. Copper, lead, nickel, and zinc are now largely obtained or purified by these methods.

There has been great improvement in the status of electroplating in the direction of an



improved understanding of the empirically arrived at methods of the plater. Many old established methods have been improved by the application of this improved knowledge and the use of modern methods of physicochemical control. The importance and the nature of the action of hydrogen-ion concentration and conductivity of the plating solution are now well understood.

Two metals not previously used in commercial electroplating are now used very largely. Cadmium, hitherto thought of as a relatively rare element, is used as a corrosion-preventing coating on iron. Chromium gives an electrodeposit harder than the hardest file, more resistant to corrosion than any other deposit except gold, resistant to high temperature and most acids. The bluish cast of chromium is now often seen on the bright parts of motor cars. It was announced in 1928 that the difficult problem of electroplating upon aluminum has been solved. Such plated aluminum should be more valuable because of increased resistance to corrosion and better appearance.

**Lacquers.** Lacquers consisting essentially of a solution of nitrocellulose in volatile solvents have been known and have had valuable applications for a long time. The related cellulose-acetate lacquers, which leave a film of much lower inflammability than those of nitrocellulose but are more expensive, came into prominence during the World War as "dope" for airplane wings. The fabric covering of the wing is fastened tightly over the framework and painted with a cellulose-acetate or nitrate solution. The great shrinkage which these materials undergo on drying produces a taut smooth surface.

These lacquers have the great advantage of very rapid drying. They dry solely by evaporation of a solvent, whereas oil varnishes and enamels dry by chemical reaction with the oxygen of the air. While it is possible to increase the rate of this oxidation of the oil film by adding catalysts, called driers, these driers tend also to accelerate the further oxidation which leads to the deterioration of the varnish film. This sets a limit to the rate of drying which can be attained. The drawback which long prevented more general use of nitrocellulose lacquers was the high viscosity of nitrocellulose solutions. A solution containing 5 per cent of nitrocellulose was about as viscous as could properly be applied with a brush or spray gun. It has lately been discovered in America that it is possible by modifications in the method of preparation of the nitrocellulose to obtain a product which gives a satisfactory consistency for application when the concentration is as high as 22 per cent. This means that less than a quarter as much solvent is needed for the application of a given amount of coating, and furthermore that a decreased number of coats are necessary because each coat leaves a thicker deposit. Both of these represent large savings in the cost of application. Further improvements, notably in the addition of resins, have led to the almost universal use of lacquers instead of oil enamels in painting automobile bodies.

**Solvents.** A most important part in the properties of any lacquer of this sort is played by the high-boiling solvents. These have a boiling point appreciably higher than that of water, they evaporate slowly, and they remain longer than any water which may be absorbed from the atmosphere during the evaporation of the more volatile solvents, and which might other-

wise destroy the tenacity and useful properties of the film. Before the World War, amyl acetate prepared from the amyl alcohol of fusel oil, a by-product of the distillation of alcohol and of distilled liquors, was available in sufficient quantities to supply the limited demand for nitrocellulose lacquers. The present demand, however, is much too large to be supplied from this source. Synthetic amyl acetate is now available, and a large part of the lacquers have been made with butyl acetate prepared from fermentation butyl alcohol.

The butyl alcohol acetone fermentation process is interesting as the one new application of fermentation to the preparation of chemicals, for the preparation of alcohol and acetic acid goes back to the mists of antiquity. Its history is an interesting example of the shift in emphasis of a chemical industry. There has long been interest in synthetic or artificial rubber, a problem which is not yet solved technically, and it was early realized that the demands for rubber are so great that the raw material from which it is to be made must be available in very large quantities. An artificial rubber can be made from butyl alcohol, and research directed toward the production of butyl alcohol resulted just before the World War in the discovery of a micro-organism which could be used for the commercial production of butyl alcohol from such starchy materials as corn. There are also obtained in this fermentation about one-half as much acetone as butyl alcohol, smaller amounts of ethyl alcohol, and large quantities of hydrogen and carbon dioxide.

During the War, there arose a vast demand for acetone which is used in the manufacture of smokeless powder, and as a solvent for airplane dopes. This fermentation process was therefore put into operation on a large scale for the sake of the acetone, the butyl alcohol being an embarrassing by-product. Now, however, both butyl alcohol and acetone are in demand as lacquer solvents. Furthermore, the bran and germ of the corn are saved for the preparation of oil and stock feed, and the hydrogen and carbon dioxide are used for the catalytic production of methanol. Altogether, this represents a beautiful example of by-product utilization.

**Farm Products.** This chemical conversion of corn to solvents offers another outlet to the products of agriculture besides the traditional one of food. It accomplishes the same end as diversification of crop. The development of chemical methods for the use of such by-products of agriculture as straw and cornstalks is exciting much interest and is being actively investigated. Straw and cornstalk paper is an interesting commercial possibility of the future if not of the present.

**Artificial Resins.** There has been a steady growth in the use of artificial resins. Baekeland discovered that combination of phenol and formaldehyde under proper conditions can be made to give a product which first softens and takes the impression of a mold when subjected to heat and pressure, but then hardens to an insoluble infusible product while the temperature is still high. For accurate molding processes, this is a great advance over the use of a plastic material of the ordinary sort which softens when heated and stays soft as long as the heat is maintained. Other types of artificial resins prepared from other raw materials also are being actively investigated.

**Rubber.** Great improvements have been made in the use of rubber. Vulcanized rubber is prepared by heating rubber and sulphur together, but no rubber product consists of these two substances alone. It was at first thought that the more rubber the better the product under all conditions, but it has been gradually realized that the carbon black, magnesia, zinc oxide, and other powdered materials which are always added are not merely fillers whose sole purpose is to save expense, but that they may exert a very favorable action upon the finished product. For one purpose, say tire treads, where resistance to abrasion is extremely important, one type of mixture gives a product much better than any pure rubber sulphur mixture could be, for another purpose a quite different mixture is desirable. Another important advance is the discovery of methods for the increased use of reclaim, that is, of rubber which has already been vulcanized and used once.

The introduction of accelerators, substances usually complex organic compounds, which exert a catalytic effect upon the process of vulcanization, is a great advance in rubber technology. Vulcanization now becomes possible at much lower temperatures or in shorter times than was possible before, and is under better control. The scientific work of Moureu in France has focussed attention upon the frequency of negative catalysis in the reactions of oxygen. Thus, it is found that benzaldehyde reacts rapidly with oxygen when pure, but that the addition of minute fractions of 1 per cent of certain substances reduces the velocity of the oxidation nearly to zero. This idea has been applied to the prevention of the deterioration of rubber, which is to a large extent the result of reaction with oxygen, and a number of rubber anti-oxidants are on the market. See RUBBER.

**Glass.** Before the World War, the special glass required for laboratory purposes was made in Germany alone. Such glass must have a very low solubility in water and chemical reagents, a property which is not possessed to a sufficient degree by ordinary glass. There has been developed in America, however, a glass which is the equal of the best previously known resistance glass in resistance to the action of water and reagents, and has in addition so low a thermal expansion that breakage due to temperature changes is greatly decreased. In addition, this low coefficient makes possible the manufacture of apparatus with a thicker wall, and this decreases the breakage from mechanical shock. This glass is used not only for laboratory apparatus, but also for household cooking ware and for many other purposes. Altogether, it is a major contribution of American technology.

The discovery of the importance to animal life of the ultra-violet light from the sun has led to the investigation of the ultra-violet transmission of glasses. Ordinary window glass is opaque to the therapeutic ultra-violet, but it has been found that suitable attention to the materials used in glass makes it possible to manufacture a glass which is transparent to these radiations.

**Bibliography.** In addition to papers appearing in the technical press, the following may be suggested as helpful in the field: *Reports of the Progress of Applied Chemistry* (London, The Society of Chemistry Industry); Darrow, *The Story of Chemistry* (Indianapolis, 1927); Slosson, *Creative Chemistry* (New

York, 1920); ib., *Snapshots of Science* (New York, 1928). Consult also *Annual Survey of American Chemistry*, and *Chemistry in the Twentieth Century*, referred to under CHEMISTRY. See PHOTOGRAPHY.

**CHENEY, SHELDON WARREN** (1886- ). An American author born at Berkeley, Calif., who founded the *Theatre Arts Magazine* in 1916 and edited it until 1921. He was associated with the Equity Players, 1922-23. His most important recent books on the theatre include *The New Movement in the Theatre* (1914), *The Art Theatre* (1917), *The Open Air Theatre* (1918), *Modern Art and the Theatre* (1921), *A Primer of Modern Art* (1923), and *Stage Decoration* (1927).

**CHERAU, shâr'-ô, GASTON** (1874- ). A French writer, born at Niort (Deux-Sèvres), France. He was the author of realistic novels in the manner of Flaubert, but his treatment, while characterized by the same minute observation, was less convincing than that of his model. His works have the atmosphere of Vendée. In *Champi-Tortu* (1906), he attempted a novel of childhood, but succeeded less well than some of his contemporaries in creating a type. His works include: *Les grandes époques de M. Thébault, Essai de psychologie bourgeoise, I* (1902); *La saison balnéaire de M. Thébault, Essai de psychologie bourgeoise, II* (1902, 1910); *Monseigneur voyage* (1903, 1910); *Le part du feu* (1909); *La prison de verre* (1911, 1912); *Le monstre* (1913); *L'Oiseau de proie et le remous* (1913); *Valentine Paquault* (1920); *La maison de Patrice* (1924); *Le flambeau des Riffault* (1925); and *Le vent du destin* (1926).

**CHERRY, CHARLES** (1874- ). An English actor born in Greenwich, Kent. He made his début at 18 and played for several years in England with John Hare. In 1899 he came to the United States and acted with Henrietta Crosman, Elsie de Wolfe, Mary Mannering, and Maxine Elliott. He starred in: *The Bachelor*; *The Spitfire*; *The Seven Sisters*; *Thy Neighbor's Wife*; *Scandal* (1920-21); *The Tyranny of Love* (1921); *The Dover Road* (1921-22); *Success* (1923); *The Camel's Back* (1923); and *The Pelican* (1924).

**CHESAPEAKE AND DELAWARE CANAL.** See CANALS.

**CHESS.** An unusually large number of international chess competitions are now being held annually at Berlin, Vienna, Budapest, The Hague, and other capitals. Recent winners of these various tournaments have been R. Reti of Czechoslovakia, A. Nimzowitsch of Germany, J. R. Capablanca of Cuba and World's Champion, 1921-1926, Alexander Alekhine of Russia, World Champion in 1927, and Dr. S. Tartakower of France. E. D. Bogoljubow of Germany is another master who has figured prominently in these international competitions, challenging the champion in 1928. In the United States, local tournaments are held, as well as annual intercollegiate and club contests.

**CHESTER, COLBY MITCHELL** (1844- ). An American naval officer (see Vol. V.) In 1917, he became professor of naval science at Yale University, and was superintendent of the naval units of Yale and Brown Universities until April, 1919. He was president of the Inter-Ocean Engineering Company and negotiated concessions for the construction of railroads and the development of mines and oil wells in Turkey. These concessions later were canceled by the Turkish government.

**CHESTER, GEORGE RANDOLPH** (1869-1924). An American writer (see VOL. V). In collaboration with his wife, Lillian De Rimo Chester, he wrote: *The Ball of Fire* (1914); *Cordelia Blossom* (1914); a dramatization of *Cordelia Blossom* (1914); *Runaway June* (1915); *The Enemy* (1915); and *Wonderful Adventures of Little Prince Toofat* (1922). He was a frequent contributor to the *Saturday Evening Post*.

**CHES-TERTON, GILBERT KEITH** (1874- ). An English author (see VOL. V). He made a lecture tour of the United States in 1921. His works since 1914 include: *The Flying Inn* (1914); *The Wisdom of Father Brown* (1914, 1921); *Poems* (1915); *The Crimes of England* (1915); *A Shilling for My Thoughts* (1916); *A Short History of England* (1917); *Irish Impressions* (1919); *The Superstition of Divorce* (1920); *The New Jerusalem* (1920); *The Uses of Diversity* (1921); *The Erils of Eugenics* (1922); *What I Saw in America* (1922); *The Ballad of St. Barbara, and other Verses* (1922); *The Man Who Knew too Much, and Other Stories* (1922); *Tales of The Long Bow* (1925); *The Everlasting Man* (1925); *William Cobbett* (1926); *The Incredulity of Father Brown* (1926); *The Return of Don Quixote* (1927); *Robert Louis Stevenson* (1927); *Generally Speaking* (essays, 1928); *The Judgement of Doctor Johnson*, a play (1928); and *The Poet and The Lunatics*, short stories (1929).

**CHESTNUT BLIGHT.** See PLANTS, DISEASES OF.

**CHETWODE, GEN. SIR PHILIP WALHOUSE, SEVENTH BARONET** (1869- ). A British soldier, educated at Eton, who rose to the rank of colonel in 1912, brigadier general in 1914, major general in 1916, and general in 1926. He served in Burma and South Africa and during the World War commanded cavalry in France, the Desert Corps in Egypt, and the 20th Army Corps under General Allenby in the Palestine and Syrian campaigns. He was military secretary at the War Office (1919-20); deputy chief of the Imperial General Staff (1920-22); adjutant general to the Forces (1922-23); commander-in-chief of the Aldershot Command (1923-27); and after 1928 chief of the General Staff in India. He was made a Knight Commander of the Bath in 1918.

**CHETWOOD, CHARLES HOWARD** (1869- ). An American surgeon and urologist, born at Elizabeth, N. J. He was graduated in arts at Princeton and in medicine at Bellevue Hospital Medical College (1887), became professor of genito-urinary surgery in the New York Polyclinic in 1897 and was secretary of the faculty (1903-09). His principal work, *The Practice of Urology*, which ran through four editions, appeared in 1913. For many years, Dr. Chetwood has made contributions on a special condition of the bladder neck, sometimes called "Chetwood's disease," in which there are the symptoms of obstruction yet no mechanical obstruction to the passage of instruments.

**CHEVALIER, she-vá'lyá', ALBERT** (1861-1923). An English actor, music-hall singer, and composer of "Coster" songs (see VOL. V). In 1916 in London, Mr. Chevalier played Eccles in *Caste*. One of his notable characterizations was Joe Brown in *My Old Dutch*, a production which he wrote with Arthur Shirley in 1916 and with which he toured repeatedly, from 1916 to 1920.

**CHEVREILLON, shē-vrē'yōn (LOUIS) ANDRÉ** (1864- ). A French writer, a nephew of Taine, who chose England and the Orient as objects of study. He was born at Ruelle (Charente), and educated at the University College School (London), the École Alsacienne (Paris), the Lycée Louis-le-Grand, and the University of Paris. He was professor of English at the École Navale de Brest in 1887-88, and from 1889 to 1894 was *maître de conférences* at the Faculty of Letters of the University of Lille. He was with the British Army at the front during the World War, and afterward (1921) was received in the French Academy. His writings fall into two distinct classes: impressions of travel, and critical essays on England and English literature. Besides many articles in the *Revue de Paris* and the *Revue des deux mondes*, his works include: *Dans l'Inde* (1891; English translation, *Romantic India*); *Sydney Smith et la renaissance des idées libérales en Angleterre au XIX<sup>e</sup> siècle* (thesis, 1894); *Terres mortes* (1897); *Études anglaises* (1901); *Un crépuscule d'Islam* (1906); *Nouvelles études anglaises* (1910); *L'Angleterre et la guerre* (1916; English translation, *Britain and the War*, with a preface by Rudyard Kipling); *Près des combattants* (1918); *Marrakech dans les palmes* (1919); *Les Américains à Brest* (1920); *Trois études de littérature anglaise* (Kipling, Shakespeare, Galsworthy), (1921; English translation, 1923); *Sanctuaires et paysages d'Asie* (1920); *L'enchanement breton* (1925); *Derniers reflets à l'occident* (1925); and *Les puritains du désert* (of Southern Algeria, 1927).

**CHIANG KAI-SHEK** (?- ). President of the Nationalist, or Nanking, government of China and an army officer whose generalship was largely responsible for its establishment during the civil wars of 1926-28. He was elected President Oct. 9, 1928, by the Central Executive Committee of the Nationalist party, after the territorial and political unity of the country had been virtually achieved by the overthrow of opposing northern war lords and the capture of Peking and Tientsin. See CHINA, under *History*.

**CHICAGO.** The second city of the United States. The population rose from 2,189,520 in 1910, to 2,701,703 in 1920, and to 3,157,400 in 1928 by estimate of the Bureau of the Census. The Negro population increased 155 per cent, from 44,103 in 1910 to 112,536 in 1920. The area is 208.6 square miles. The metropolitan district, as officially defined, comprises the counties of Cook, Kane, DuPage, Lake, and Will in Illinois and Lake in Indiana and has a total area of 3596 square miles.

Since 1909 the development of the city according to the plan of the Chicago Plan Commission has been in process. The cost of 12 city-planning improvements between 1909 and 1920 totaled more than \$230,000,000, including bonds voted to the amount of \$61,500,000 and \$8,000,000 of special assessments on property directly benefited. In 1927 a bond issue of \$3,700,000 for the construction of the Wabash Avenue Bridge across the Chicago River and another of \$15,000,000 for the construction of the Town Hall were approved. A zoning commission, headed by the city commissioner of buildings, was appointed in 1921. Two years later, the city adopted four classes of use and five of volume districts, the latter type being a combination of the more usual height and area districts.

Roosevelt Road, one of the important street improvements, was completed from Ashland Avenue to Michigan Avenue, the street being widened for two miles of its length from 66 to 108 feet at a total cost of \$4,500,000. Michigan Avenue was widened to 130 feet its entire length to the river, and carried on in a straight line via a new drawbridge supplanting the narrow Rush Street Bridge into Lake Shore Drive, north of the river. The bridge and approaches were built on two levels. The cost of this improvement was \$13,115,558, of which amount about \$8,000,000 was for the bridge. The bridge houses have been embellished by four groups of sculpture. The two groups on the south pylons, which are the work of Henry Hering, are entitled "Defense" and "Regeneration," the one commemorating Fort Dearborn and the Massacre of 1812 and the other the great Chicago fire of 1871. The groups to be placed on the north pylons, which are the work of Earl Fraser, are entitled "The Pioneers" and "The Discoverers" and commemorate Chicago's early history. The Wacker Drive improvement on the northern boundary of Chicago's central business district was completed in 1926. Two levels have been provided. The upper level, which is 110 feet wide, is for general traffic, and the lower level, which is 135 feet wide, is for the exclusive use of heavy, commercial traffic which can pass six abreast, three lines in one direction and three in the other, without interruption from cross traffic.

Two extensive railway terminal developments, involving a total expenditure by the railroad companies of some \$163,000,000, have been going forward in line with the plan of Chicago. The Union Station, which cost \$75,000,000 to erect, is completed. The other project is that of the Illinois Central Railroad. Electrification of this railroad's suburban service has been completed, and plans were being developed for the erection of a new \$88,000,000 terminal to accommodate the 13 railroads using three different south side stations. Chicago is the largest railroad centre in the West, 38 railroads, including 23 trunk lines, terminating there. Freight traffic in and out of Chicago consists of about 21,000 cars per day; 4501 industries are served by private side tracks. Beneath the streets of Chicago's business district are 61 miles of freight tunnels, electrically operated, connecting railroad freight stations and 60 factories, warehouses, stores, and office buildings, thus eliminating trucking. In 1929 the Chicago & Northwestern Railway constructed a \$2,000,000 freight station on the site of its old passenger terminal at Wells Street, with a capacity for handling 10,000 tons of freight daily. The air rights were sold to Marshall Field & Co. which were to erect over the terminal an 18-story Merchandise Mart costing \$30,000,000. Chicago's rapid-transit service operates 1850 cars over 227 miles of track and carries 227,000,000 passengers annually. The Chicago surface lines operate 3639 cars over 1080 miles of single track and carry 882,000,000 passengers annually.

Chicago has an extensive system of parks and boulevards, the park area within the city limits being 6446 acres. More than 200 acres have been added to Lincoln Park on the north by filling in the Lake Michigan shore. The project cost \$1,875,000, but the land so made is estimated to be worth \$15,000,000. The south shore development from Grant Park to Jackson Park,

consisting of a park 1138 acres in extent, 6 miles long and varying in width from 1100 to 4000 feet, is being carried out. Within this park there will be a lagoon 6 miles long, 600 feet wide, and covering an area of 343 acres. The development will include also playgrounds, golf courses, yacht harbors, driveways, walks, picnic grounds, tennis courts, and other forms of outdoor recreation and has required the issuance of \$52,000,000 of bonds.

The Field Natural History Museum has been built at the southern end of Grant Park at a cost of \$6,000,000 as the first step in the development of this space as an educational centre. One of the principal features is a terrace, 40 feet wide and 6 feet high, which has a retaining wall, steps, and balustrade of the same marble as the building proper. Soldiers' Field, an athletic stadium seating 65,000, has been erected south of the Field Museum. The Fine Arts Building in Jackson Park has been restored at a cost of \$5,000,000 and will house an industrial exhibit, inspired by the industrial museums of Munich and Vienna and made possible by the gift of \$3,000,000 from Julius Rosenwald. Chicago is to have a large aquarium as a result of the gift of \$3,000,000 from the late John C. Shedd. The aquarium, which will form part of the lake-front development, will be 300 feet in diameter and will have an octagonal dome 100 feet high. The Morton Arboretum, founded in 1921 by Joy Morton on his estate at Lisle, is being developed into one of the largest arboreta in the United States. The Chicago Zoological Park is being organized on a 196-acre tract near Riverside. Plans include a goat hill 100 feet high, beautiful fountains, landscape gardening, an artificial lake, and many other features that will give the animals natural surroundings.

Thirteen steamship lines serve the port of Chicago, which has 101 miles of water front, 52 miles of which are equipped with dock and railroad facilities. A municipal pier 3000 feet long and 292 feet wide, with 8500 feet of dockage, was completed in 1916. Railroad tracks and warehouses for convenience of shipping and trolley tracks extend the length of the pier. A rock-filled pile breakwater, 2350 feet long, protects the pier from heavy weather on the lake and has been so built that it can be used as the dock walls of other piers and can be extended as required when additional commerce makes such action necessary. The Chicago municipal airport is one of the finest in the United States. It has an area of 320 acres, about half of which has been improved; and negotiations are under way to have the Belt Line Railroad, which bounds the north side of the field, moved further to the north to make available another 320 acres. Chicago is the terminus for seven air-mail routes. There are 19 smaller commercial, municipal, and military airports and landing fields, exclusive of auxiliary fields, and eight aircraft manufacturers are located in the metropolitan area.

There are 46 industrial districts in Chicago, comprising an area of 6855 acres. In 1925 there were 9112 manufacturing establishments employing 370,041 persons and paying \$563,634,650 in wages, according to the U. S. Census of Manufactures; the value of products manufactured, was \$3,439,163,391. During the past few years, Chicago has undergone an extensive building transformation. The year 1926 witnessed the construction of 1560 stores and factories, 130 of

fice buildings, 7415 single residence, 51 churches, halls, and theatres, 4523 apartment buildings, and 562 miscellaneous buildings. During 1927, 12,025 permits were issued for buildings at a cost of \$352,936,000. Two outstanding buildings are Tribune Tower, the home of the Chicago *Tribune*, erected in 1923 at a cost of \$7,000,000 and the Chicago Daily News Building, erected in 1929 at a cost of \$13,000,000. The latter was the first structure to use the "air rights" above the city's railroad tracks and was also the first building to utilize the elevated sidewalk arcade in an effort to solve the complicated pedestrian-traffic problem. The assessed valuation of property in 1927 was \$4,250,438,000; the net debt was \$241,700,000. Chicago has 3490 miles of streets within the city limits, of which 2550 miles were paved at the end of 1927. Ten pumping stations pumped more than 330,000,000 gallons of water through 375 miles of water mains during 1927. The typhoid fever death rate is the lowest in the United States for any city over 500,000 population. Chicago is the home of the Federal Reserve Bank of the seventh district and its bank clearings in 1928 totaled \$37,842,400,000. The Chicago public-school system includes 290 elementary, 14 junior high, 24 high, and 1 normal schools. The public-school enrollment during 1927 was 522,904. In addition, 137,958 students attended denominational schools. The ten major colleges and universities in Chicago were attended during 1927-28 by 47,000 students. In 1920 the city increased the number of city wards from 35 to 50, but reduced ward representation on the city council from two to one, thus cutting the council membership from 70 to 50.

**CHICAGO, UNIVERSITY OF.** A coeducational institution at Chicago, Ill., founded in 1890, largely through the gifts of John D. Rockefeller, although additional millions in contributions were subsequently received from other sources. The enrollment of students grew from 744 in the year 1892-93 to 7781 in 1914-15, and to 8108 in the autumn quarter and 6342 in the summer quarter of 1928. The number of members on the faculty, above the rank of assistant, increased from 274 in 1914-15 to 755 in 1927-28. The bound volumes in the libraries increased from 458,616 in 1914 to approximately 800,000 in 1928; and in addition, it was estimated that there were available about 400,000 unbound volumes and pamphlets. The productive funds increased, between 1914-15 and 1927-28, from \$18,598,275 to \$43,400,000; and it was estimated that the total resources of the University, including funds held as agent and funds held temporarily, were in excess of \$77,800,000. The University and affiliated institutions in 1928 occupied over 65 buildings for educational purposes and 196 acres of land, including the site of the Yerkes Observatory at Williams Bay, Wisconsin.

Numerous gifts and bequests were made to the University during the period under review, including the property, with an estimated value of \$1,500,000, deeded in 1918 by LaVerne Noyes, to constitute the LaVerne Noyes Foundation, the income to be used to pay tuition fees for deserving students who had served in the Army or Navy of the United States in the World War, or for their descendants. In 1925 work was begun on the construction of the Albert Merritt Billings Hospital and in following years large sums were added to the Frank Billings Medical

Endowment Fund. The Divinity School in 1916 received an anonymous gift of \$200,000 for buildings, and this sum was later augmented by a gift of \$150,000; and in 1925 by \$1,000,000 from John D. Rockefeller, Jr., as additional endowment for the school. In the same year, \$500,000 was received from the Wieboldt Foundation for a modern language building and \$1,000,000 from Douglas Smith for the endowment of medical research, the income to be used for the investigation of the causes, nature, prevention, and treatment of disease. In the autumn of 1925, the University engaged in a campaign to raise \$17,500,000 for the endowment and new buildings, and by October of that year had raised over \$6,000,000 of the amount. The University Chapel, seating about 2000, was begun in 1925 and completed in 1926. In the latter year, the grand-stands at Stagg Field were enlarged to accommodate 48,000 spectators; the Carnegie Corporation granted \$1,385,000 for the establishment of a graduate library school; and the total outlay for the construction of buildings approximated \$8,500,000, while the sum expended for the same purpose in 1927 was over \$8,000,000. In 1927 George Herbert Jones contributed \$665,000 for the erection, equipment, and maintenance, of the George Herbert Jones Laboratory, for the department of chemistry; Col. John Roberts gave \$1,000,000 for the erection and maintenance of a hospital to be known as the Bobs Roberts Memorial Hospital for children; in 1928 contributions to the Frank Billings Medical Endowment Fund totaled \$401,923; Mr. and Mrs. Albert D. Lasker gave \$1,000,000 to endow a programme of medical research into the causes, nature, prevention, and cure of degenerative diseases common to middle age; John D. Rockefeller, Jr., pledged \$15,000 a year for five years for the expenses of the Oriental Institute; and Mr. Julius Rosenwald gave a total of \$500,000 in two equal sums for the departments of physics, mathematics, and astronomy, and to the building fund of the Chicago Lying-in Hospital and Dispensary. Robert Maynard Hutchins, LL.D., was elected president in 1929.

**CHICAGO DRAINAGE CANAL.** See CANALS; SEWERAGE AND SEWAGE TREATMENT.

**CHICAGO FIELD MUSEUM.** See EXPLORATION.

**CHICAGO OPERA ASSOCIATION.** See MUSIC, under *Opera*.

**CHICAGO SANITARY DISTRICT.** See SEWAGE AND SEWAGE TREATMENT.

**CHICAGO SYMPHONY ORCHESTRA.** See MUSIC, under *Orchestras*.

**CHICKERIN, GEORGY VASSILIEVICH.** See TCHITCHERIN.

**CHILD, CHARLES MANNING (1869- ).** An American zoologist born at Ypsilanti, Mich. He was educated at Wesleyan University (Ph.B., 1890; M.S., 1892), and at the University of Leipzig (Ph.D., 1894). He was assistant in biology at Wesleyan University (1890-92); and assistant in zoology (1895-96), associate (1896-98), instructor (1898-1905), assistant professor (1905-09), associate professor (1909-16), professor (1916- ), at the University of Chicago. Besides numerous articles in zoological journals, he published *Senescence and Rejuvenescence* (1915); *Individuality in Organisms* (1915); *Origin and Development of the Nervous System* (1921), and *Physiological Foundations of Behavior* (1924).



**CHILD, RICHARD WASHBURN (1881- )**. An American author and diplomat, born at Worcester, Mass., and educated at Harvard University. He was engaged in the practice of law during the period 1906-17. In 1917-18 he was employed in the United States Treasury on problems of war finance. In 1919, he became editor of *Collier's Weekly*. He was American Ambassador to Italy, 1921-24. In 1922 he represented the United States at the Conferences at Genoa and Lausanne. He wrote: *Jim Hands* (1910); *The Man in the Shadow* (1911); *The Blue Wall* (1912); *Potential Russia* (1918); *Vanishing Man* (1919); *Velvet Black* (1920); *The Hands of Nara* (1921); *Fresh Waters* (1924); *A Diplomat Looks at Europe* (1925); and *Battling the Criminal* (1925).

**CHILD LABOR.** The movement for the restriction of the labor of children in industry has been vigorously carried on in the United States since 1914 and, while no outstanding successes could be reported, there can be no question that there was much to hearten the friends of the movement. Federal action had definitely to be abandoned; a number of States were slow to adopt even elementary reforms and were lax in the administrative enforcement of the laws on their statute books; but the manufacturers employing child labor were plainly put on the defensive and the intelligent efforts of the National Child Labor Committee were making their mark in the creation of a favorable public opinion. Too, the patient researches of the Children's Bureau of the U. S. Department of Labor and the propaganda carried on by the American Federation of Labor were helping to illumine many dark corners. The period of the World War had seen the relaxation of the vigilance of the administrative officers with the result that an unusual number of work permits for children was granted; but the economic depression that set in with the end of 1920 brought a movement back to the schools and, despite such setbacks as the upsetting of the Federal Child Labor Tax Law and the defeat of all efforts generally at Federal control, there was no concerted attempt to lower standards.

**Statistics.** Over the period 1910-1920, the number of children gainfully employed decreased markedly. In 1910 there were 1,090,225 children from 10 to 15 years, inclusive, gainfully employed in industry; by 1920 the figure had dropped to 1,060,858, or a decrease of 46.7 per cent. In the same decade, the child population had increased 15.5 per cent. Thus, in 1910, 18.4 per cent of all children were gainfully employed, as against a proportion of 8.5 per cent in 1920. This decline was to be found in all industries. In 1910 there were to be found 1,432,428 children in agriculture; by 1920 the figure had dropped to 647,309. In mining activities, there were 18,090 children in 1910 and 7191 in 1920. In domestic service, there were to be found 112,157 children in 1910 and 54,006 in 1920. In manufacturing and mechanical industries, there were being employed 260,944 children in 1910 as against 185,337 in 1920. In clerical occupations, the number increased from 71,001 to 80,140 in 1920.

It is of interest to note that more than one-third of the 1,060,858 child workers in 1920 were under 14, the legal age for factory employment in 45 States at the time of the taking of the census. The failure of the State child-labor laws to prevent this widespread employment of

children was to be attributed to the numerous exceptions permitted by many of the State laws as well as to the inadequate enforcement of their provisions. It is impossible to give more than estimates for the extent of child labor for the period following 1920. The National Child Labor Committee, in 1926 during the period of agitation for the ratification of the Federal Child Labor Amendment, placed the figure at 2,000,000. Another source, estimating on the basis of child population and school attendance, put the number of children between 7 and 15, inclusive, gainfully employed at 3,000,000 and the number of children between the ages of 7 and 18 at 5,800,000. The American Federation of Labor reported that the following States had the largest number of child workers between the ages of 10 and 15 inclusive: Georgia, 89,000; Alabama, 84,000; Texas, 81,000; Mississippi, 70,000; South Carolina, 64,000; North Carolina, 62,000; Pennsylvania, 56,000; New York, 50,000.

**Federal Action.** The period saw the complete defeat of all efforts to end child labor by the action of the Federal Government. Early in 1916 the Keating-Owen Bill was passed by both houses of Congress and became a law on Sept. 1, 1917. This measure, enacted under the interstate-commerce clause of the Constitution, prohibited the shipment in interstate commerce, within 30 days after production, of any goods produced by children under ages specified for certain industries. Its constitutionality was attacked almost immediately in North Carolina and, on appeal to the Supreme Court of the United States, the law was declared invalid in June, 1918, on the ground that it interfered with the powers reserved to the States under the Tenth Amendment. Another act was immediately passed by Congress, becoming a law in February, 1919. In an attempt to circumvent the objection of the Supreme Court, the basis of the act was shifted from the interstate-commerce clause to the taxing power of the Congress by the placing of a 10 per cent tax on the net profits of all commodities produced as a result of the labor of children. This, too, was at once questioned in the courts of North Carolina; in 1922 the law was declared unconstitutional by the Supreme Court. By a unanimous decision, the Court found that Congress was using its tax power illegally, i.e., to punish instead of for the raising of revenue.

The friends of Federal action refused to be deterred. Late in 1923 there was introduced in Congress the Federal Child Labor Amendment, which ran as follows: "*Section 1.* The Congress shall have power to limit, regulate, and prohibit the labor of persons under 18 years of age. *Section 2.* The power of the several States is unimpaired by this article except that the operation of State laws shall be suspended to the extent necessary to give effect to legislation enacted by Congress." On Apr. 26, 1924, by a vote of 297 to 69, the House adopted the amendment; on June 2, the Senate did likewise by a vote of 67 to 23. The amendment thus went to the States for ratification. It met with a speedy fate. By Jan. 27, 1925, it was seen that the amendment had been lost through the rejection of it by 13 State legislatures. Before 1925 was over, the following States had refused their ratification: Connecticut, Delaware, Florida, Georgia, Indiana, Kansas, Louisiana, Maryland, Massachusetts, Maine, Minnesota, Missouri, New Hampshire, North Dakota, North Carolina,

Ohio, Oklahoma, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Washington, West Virginia. By the end of 1928, only five states had ratified: Arizona, Arkansas, California, Montana, Wisconsin.

The following reasons were generally cited for the defeat of the amendment: It was an unwarranted interference with the rights of the States. It marked a recoil against the tendency to seek Federal action in the solution of social and economic problems. It was felt that the general hostility toward the passage of the Eighteenth Amendment (Prohibition) was making itself felt in opposition to all Federal amendments. The farming groups had opposed the ratification of the act because of their feeling that the amendment would be used to prevent the employment of their own children on family-owned farms. The American Federation of Labor directly charged that the farmers had defeated the amendment. While the friends of the amendment indicated their belief that this method of solving the problem was not closed to them and that the agitation for ratification would continue, there was a marked lessening of the propaganda. At its 1926 convention, the American Federation of Labor still breathed its defiance of the employers of child labor; at subsequent conventions, its voice was raised in other causes. Even the National Child Labor Committee, in its 1928 annual meeting, had nothing to say about the continuance of pressure for the passage of the Child Labor Amendment.

**State Action.** The status of children in industry was safeguarded by the States and many of them had elaborate codes on their statute books. Unfortunately, the enforcement of these laws presented difficult problems and too often inadequate provision was made for the creation of administrative machinery. For example, in most States, there were no special child-labor inspectors and the regular factory inspectors were expected also to perform these functions. With respect to the age limit, Utah and Wyoming did not fix a minimum age; 41 States forbade certain types of work for children under 14; 5 States forbade work for children under 15; Montana and Ohio fixed the minimum age at 16. Twenty-three States, however, allowed children under 14 to work outside of school hours and, in the following States, children under 14 were permitted to work in factories: California, Colorado, Idaho, Nevada, New Mexico, and Virginia. In 17 States, children were barred from working in only a limited group of occupations. Therefore, in only 9 States were children under 14 absolutely forbidden to work. Tenement home work was regulated in 14 States; 25 States had no laws affecting street trades. With regard to the issuance of employment permits, only 13 States required such.

The following were the provisions made with regard to the employment of children in hazardous industries: in 30 States, 16 years was the age limit for work in mines and quarries; in 33 States, 14-year-old children might work on railroads and, in 28 States, they might work around explosives; in 35 States, it was lawful for children to work on scaffolding; in 22 States, they might run elevators, and in 17, they were allowed to wipe, oil, and clean machinery in motion. Montana was the only State which did not permit children to work on or near machinery.

The following provisions were in effect with

regard to the schooling of working children: in 15 States, a child had to finish 8 grades (unless over 14 years of age); in 5 States, a child had to finish 8 grades (unless 16 years old); in 10 States, a child had to finish the sixth or seventh grade; in 5 States, the fifth grade; in 2 States, the fourth grade; in 6 States some simple educational requirement had to be filled; in 7 States no educational requirement was necessary. In most States, no permits were necessary if the child was over 16 years. In 28 States, the child had to stay in school until 16, if not working; in 14 States, the child had to stay in school until 17 or 18, if not working. In 24 States, health certificates were required for working children under 16 years. The following were the requirements with regard to hours of work: Montana forbade all factory labor by children under 16; 37 States had an 8-hour day and a 48-hour week (3 of these had the 44-hour week); 5 States had a 10-hour day and the 54-hour week; Georgia and North Carolina each had a 60-hour week.

Almost all States forbade night work for children under 16; 13 States fixed the hours of night work as between 7 P.M. and 6 A.M.; 24 States provided for longer rest periods; Nevada and Utah made no provision at all. The States sought to protect minors, illegally employed, who had suffered injuries in the following ways: in 14 States, children illegally employed fell outside the workmen's-compensation law and the only recourse was a civil suit; in 19 States, such minors that were injured might ask for compensation under the workmen's law; in Wisconsin, the employer alone had to pay triple compensation; in Maryland, Michigan, New Jersey, and New York, the employer had to pay double compensation; in Illinois and Missouri, the employer had to pay an additional 50 per cent. Continuation-school laws were on the statute books of 27 States: in 14, employed children under 16 had to attend these schools for from 4 to 8 hours weekly; in 13 States, employed children under 18 had to go to continuation school.

**Standards.** The minimum standards of the National Child Labor Committee were as follows: 1. No child under 14 shall be employed in any gainful occupation. 2. No child under 16 shall be employed: a. At any work or in any place dangerous to life, health or morals. b. After 7 at night or before 6 in the morning. c. For more than 8 hours a day or 48 hours a week. d. During the hours when the public school is in session, unless the child has completed the eight grade. e. Without a work permit. 3. No child under 18 shall be employed at any work or in any place dangerous for children under 18, e.g., oiling, wiping, or cleaning machinery in motion; switch tending; working in connection with electric wires, explosives, elevators, hoisting machines; night messenger work.

The National Association of Manufacturers, late in 1927, announced the following plan for the greater protection of working children of the ages of 14 and 15. 1. An employment certificate issued under State authority for each job applied for. 2. A physical examination by physicians designated by the State. 3. Completion of the sixth grade with proper provision for vacation permits. 4. A minimum of four hours a week of continued education either in continuation schools or under shop plans approved by properly constituted State authority,

which should have the power to release individuals incapable of further education. 5. For children under 16, in manufacturing, mining, transportation, or commercial occupations, a 48-hour week. No night work after 9 at night or before 7 in the morning. 6. The strengthening of laws forbidding the employment of children in hazardous occupations. This plan was subject to considerable attack on the following grounds: 37 States and the District of Columbia already had 8-hour laws; 37 States and the District of Columbia already forbade night work after 5, 6, or 7 P. M.; it was a minimum programme in that a large number of States had already accepted or gone beyond the standards set up by the manufacturers, e.g., only 6 States did not require employment certificates, 17 States did not require physical examinations, 19 States did not require the completion of the sixth grade, 21 States had no continuation-school law, 32 States permitted work before 7 A. M., 5 States permitted work after 9 P. M. in manufacturing industries and 15, in mercantile establishments.

The following is the programme adopted in 1928 by the International Federation of Trade Unions, the Labor and Socialist International, and the Socialist Youth International: 1. The minimum age for work shall be through 14 years. 2. Attendance at an elementary school shall be compulsory until admission to the wage-earning class. 3. The introduction of compulsory vocational instruction until the eighteenth year. 4. The extension, up to the completion of the eighteenth year, of protective legislation applicable to apprentices and young workers. 5. The 48-hour week. 6. A free Saturday half-holiday and a free Sunday. 7. No night work. 8. A minimum of three weeks' paid holiday for wage-earning young persons under 16, a two weeks' paid holiday for wage-earning young persons between 16 and 18. 9. Regulations providing for the welfare, unemployment relief, and training of unemployed young workers.

**International Action.** By the draft convention adopted at the Washington Conference of 1919, 14 years was set as the entering age for children working in manufacturing plants, mines, and transportation. By the conventions of 1920 and 1921, the occupations of seafaring, commerce, and agriculture were included. The convention of 1919 was ratified by the following countries: Belgium, Bulgaria, Chile, Czechoslovakia, Denmark, Estonia, Finland, Great Britain, Greece, Irish Free State, Italy, Japan, Latvia, Netherlands, Poland, Rumania, Jugoslavia, and Switzerland. China and India passed similar laws. The 1920 convention affecting seafaring activities was ratified by 19 countries. The 1921 convention, concerning itself with the employ of children in agriculture, was ratified by 11 countries. The 1919 and 1921 conventions also forbade the employment of children (under 18 years) in industry and agriculture between 10 at night and 5 in the morning. These were adopted by 20 countries, as follows: Austria, Belgium, Bulgaria, Chile, Denmark, Estonia, Finland, France, Great Britain, Greece, Hungary, India, Irish Free State, Italy, Latvia, Netherlands, Poland, Rumania, Jugo-Slavia, and Switzerland.

**CHILD WELFARE.** Since 1915 the interest in the problems of child welfare has constantly increased and there has been great activity among public, as well as private, agencies in the United States. In 1912 there was a special bureau for

the health of children in only one State; by 1928 such bureaus were to be found in all the States. The practice of physical and dental examinations in the public schools was rapidly spreading. Special agencies to provide for dependent, neglected, and delinquent children had been one of the great developments of the period under examination (see JUVENILE COURTS). As a result of mothers'-pension legislation, 44 States had made it possible for dependent children to stay in their own homes. During the period 1915-28, States were putting on their statute books laws providing for the care and education of the physically handicapped, the tubercular, the blind and deaf, and the mentally defective. The same period saw the great development of the idea of foster-home care for dependent children, with the result that institutional orphan asylums were regarded askance by those familiar with the latest methods in child care. It is true that a good deal of the enthusiasm that marked the consideration of those problems was not subject to scientific scrutiny largely because of the absence of reliable data. There were no data that made it possible, e.g., to compare the effects of foster-home care with that in an institution.

Again, how many of the programmes for the checking of delinquency, the boys' clubs, the Big Brothers, etc., had in mind a definite idea of the nature of the problem and whether or not the methods then in use were meeting with any success? Frank critics pointed out that these elaborate projects were attracting the good boys (who would remain good, anyway) and had no effect on the bad boys. At any rate, the period showed that it was necessary to get at fundamentals. Nursery schools, where two-year-old children were assembled in groups, provided for expert supervision of play, feeding, sleeping, habit formation, etc., so that, through the examination of control groups, it might be possible to answer some of the perplexing problems that were arising.

In the field of public health, the advances were apparent. During the year 1927, the infant mortality rate was the lowest on record. For the 683 cities in the birth-registration area, the rate was 64.9 per 1000 live births, as compared with the 1926 rate of 73.7. Seattle had the lowest rate among the large cities, with 41 deaths per 1000 live births; New Orleans had the highest rate, with 88. There can be no question that this gratifying improvement was due to energetic public-health programmes, especially those that grew out of the work of the Shepherd-Towner Act. See MATERNITY PROTECTION.

The Children's Bureau of the Department of Labor, which was founded in 1912 and was the first national organization of its kind in any country, has been a clue in this field. Its work began with an inquiry into the subject of infant mortality and published reports on its findings and popular bulletins on proper infant and maternal care. Subsequently, it carried on research and published much material on such subjects as child labor, juvenile delinquency, and juvenile courts, illegitimacy as a problem in child welfare, and the mothers'-pension laws. It also investigated the methods of child care in New Zealand, which had the lowest infant mortality rate of any country. The Bureau was given the administration of the first Child-Labor Act, which was in effect nine months before it was declared unconstitutional,

and of the Maternity and Infancy Act. See MATERNITY PROTECTION; CHILD LABOR; MOTHERS' PENSIONS; EDUCATION IN THE UNITED STATES.

**CHILDREN'S BUREAU.** See CHILD LABOR; CHILD WELFARE.

**CHILE**, chē'lā. A South American republic extending along the western or Pacific coast from Peru to the southern extremity of the continent. Its area is 200,084 square miles and its population, by the census of Jan. 1, 1920, 3,754,723. This was a gain of 505,444 over the last official census, that of 1907, or an annual increase of 1.2 per cent. The populations of the principal towns in 1927 were Santiago, the capital, 587,875; Valparaíso, 191,750; Concepción, 64,074; Iquique, 36,200; Talcahuano, 35,152; Chillán, 31,187; Antofagasta, 60,331. The movement of population continued toward the cities in 1920: 46.6 per cent was urban, as compared with 38.6 per cent in 1895 and 43.3 per cent in 1907.

**Agriculture.** In 1924-25 there were in Chile 5,095,000 acres of arable land, or 2.7 per cent of the total area, 32,744,000 acres of permanent meadows and pasture; 239,000 acres of trees, shrubs, and bushes; and 12,216,000 acres of woods and forests. The following table shows the advance made in agriculture from the pre-war to the post-war period.

Crop	Area (thousands of acres)		Production (thousands of units—bushels except as indicated)	
	1909-10	1926-27	1909-10	1926-27
	to 1913-14		to 1913-14	
Wheat	1,055	1,432	21,243	23,286
Barley	116	190	4,309	5,202
Oats	81	139	3,503	4,139
Corn	59	58	1,538	1,577
Potatoes	73	69	9,048	11,230
Beans	....	95	....	2,226
Peas	....	23	....	377
Grapevines	150	175	56,735 *	54,432 *

\* Unit, gallon of wine.

In 1927-28 there were 33,524,000 bushels of wheat, 7,032,000 of barley, and 7,172,000 of oats produced. The possibility of reaching the American market during the winter for fruits and vegetables has led to a growing interest in horticulture and gardening. The trend toward intensive agriculture manifested itself in the increase in dairy farming, though production by 1928 did not yet suffice for local wants. In 1926 livestock included 323,581 horses, 27,364 asses, 40,187 mules, 1,918,433 cattle, 4,093,872 sheep, 357,033 goats, and 246,636 pigs. These showed little change from the figures of 1912. The wool clip in 1919 amounted to 16,937 metric tons, and in 1927 it was 10,000 metric tons.

**Mining.** In spite of the importance of agriculture, mining is the greatest source of the

silver, cobalt, manganese, coal, salt, borax, sulphur, and other minerals. Nitrate of soda with its by-product, iodine, remains the most important single mineral product and the chief article of commerce; its production steadily absorbed large blocks of capital. The following table indicates the production and export of nitrate for certain years.

Year	Production in Metric Tons	Export in Metric Tons
1910	2,465,415	2,335,941
1915	1,755,291	2,023,294
1918	2,859,303	2,919,177
1919	1,703,240	803,961
1921	1,311,036	1,193,062
1923	1,903,527	2,257,158
1926	2,016,429	1,452,635
1927	1,615,111	2,375,441

A break in the nitrate market followed in 1921 and 1922 as a result of the fall of the farmers' purchasing power the world over. The manipulations of a European buyers' pool and a producing association were features of this trade. More than 3,000,000 tons accumulated with no buyers. The ensuing depression affected the whole country because of Chile's dependence on its nitrate trade. Chilean pesos dropped from 3 to 11 to the dollar; more than four-fifths of the nitrate plants closed, and hard times were universal, so that the Government was compelled to resort to unemployment doles. The market did not recover until the producers yielded to necessity in 1922-23, and cut prices materially. This was due largely to the development of synthetic fertilizer manufactures. The year ending June 30, 1923, saw the sale of 2,000,000 tons of nitrate, and the year 1927 saw the exportation of 2,375,441 tons. In the calendar year 1927, total mineral products exported were valued at \$164,711,000, an increase of \$40,000,000 over the 1911 figures.

**Manufacturing.** In 1926 Chile had 3075 manufacturing establishments using raw materials to the value of 813,771,000 paper pesos (1925); 78,499 workmen were employed. Goods valued at 1,471,584,000 paper pesos were produced. Leading manufactured products are food supplies, gas and electric power, textiles, leather, furs, clothing, chemicals, paper, metal goods, alcohol, lumber, and tobacco. In 1920-21 German capital became active once more and German shipping became important, woolen mills, flour mills, and railway shops and other industrial establishments increasing in the southern districts around Concepción, Penco, and Valdivia.

**Commerce.** Up to 1920, Chilean commerce showed steady advancement except in 1915 and 1916, but the depression that set in with 1920 brought the trade record for 1922 below the pre-

Country	Imports		Exports	
	1913	1927	1913	1927
United States	\$20,048,159	\$38,340,000	\$30,413,385	\$64,381,000
Belgium	5,671,428	9,082,000	5,674,659	3,898,000
Germany	29,578,138	16,286,000	30,772,742	22,365,000
Great Britain	36,109,210	23,836,000	55,548,341	72,862,000
France	6,623,260	6,658,000	8,847,885	6,755,000
Others	22,202,808	26,308,000	11,144,575	33,682,000
Total	\$120,274,001	\$120,510,000	\$142,801,577	\$203,943,000

country's economic wealth. The copper industry increased in recent years, Chile advancing to the place of the world's second largest producer. Iron ore deposits, placed at 1,000,000,000 tons, are found in the departments of Atacama and Coquimbo. Besides, there are mines for gold,

war level. Imports for 1913, 1920, 1922, and 1927 were worth \$120,274,001, \$166,103,810, \$86,571,275, and \$120,510,000; exports for the same years were \$142,801,577, \$284,293,108, \$121,037,500, and \$203,943,000. The accompanying table indicates the distribution of the

trade by countries for 1913 and 1927. In 1928 imports amounted to 1,169,700,000 pesos (1 peso = \$.1217) and exports to 1,965,900,000 pesos, an increase over 1927 of 9 per cent in imports and 16.4 per cent in exports.

The United States steadily forged to the front in Chilean trade during the World War and was able to maintain its leading position afterward. In 1918 Chilean exports to the United States equalled the combined values of all other countries, while imports from the United States into Chile accounted for 46.6 per cent of the total. In 1927 American imports into Chile were 29.7 per cent of the total, as compared with 16 per cent in 1913. Exports to the United States were 31.6 per cent in 1927 and 21.3 per cent in 1913. Thus, Great Britain was completely supplanted. The maintenance of cordial commercial relations between Chile and the United States was due to the expansion of shipping facilities, the local establishment of American banks and credit information companies, investments in Chilean mines and industries, and the completion of direct cable service. Shipping in 1922 was far below the pre-war level, but improved materially by 1928. Foreign vessels and tonnage entering Chilean ports in 1911 were 14,898 vessels, of 26,164,068 tons, and in 1926, 3666 vessels, of 11,612,000 tons. By the law of 1922, coastwise trade was confined to ships of Chilean registry. In 1912 six American ships of 9000 tons entered Chilean ports; by 1926 the figure was 501 ships of 1,773,000 tons.

Communications. In 1926 there were 5356 miles of railway, 3398 of them State owned, as compared with 2740 in 1911, with 1418 State owned. In 1921 work was begun on electrification of the line between Santiago and Valparaiso and that between Llay-Llay and Los Andes, 233 miles in all; this was completed in 1924. Though agitation was carried on for construction of the Chilean section of the Antofagasta (Chile)-Salta (Argentina) railroad, no headway was made; this was due to a feeling prevalent in Chile that Argentina would receive most of the benefit from the line. The projected railway is 350 miles, 200 miles of which lie in Chile.

Finance. The budget for 1929 provided for the collection of 1,123,291,500 pesos in revenue. The 1912 figures were 101,050,000 gold pesos and 189,200,000 paper pesos. Expenditures in the 1928 budget totaled 1,071,603,975 pesos; in 1912 expenditures according to the budget were 81,070,966 gold and 280,894,118 paper pesos. The public debt on Dec. 31, 1922, was \$240,673,000. The paper peso in 1914 was worth, on an average, 5.50 to the dollar, and in 1918, 3.47; but in 1921 the industrial depression lowered it to 8.29; in 1922 it was 8.41; and the average for 1923 was 8.22, notwithstanding improved economic conditions. By 1927 it was fairly well stabilized at about \$0.1207, or a little over 8 to the dollar.

Education. Primary education was made compulsory in 1920, but the figures for 1928 show no great change from 1911. In the later year, primary schools numbered 3123 (2896 in 1911); enrolled pupils, 459,777 in July, 1928 (375,274 in 1911); and teachers, 9414 in 1926 (4829 in 1911). In 1926, 60,620 pupils were in secondary schools (20,329 in 1911). Two new universities were opened in 1920, the Industrial University at Valparaiso and the University of Concepcion. Agricultural and vocational education are receiving increased attention.

History. The known sympathies of a considerable element of the Chilean population for Germany in the World War, through family, intellectual, and commercial ties, did not interfere with the neutrality which it maintained throughout. The falling off of trade immediately following the outbreak of the War caused serious unrest, but affairs improved when Chile began to play a prominent part in furnishing the Allies with war materials. In 1918 this intercourse reached its peak, with widespread prosperity. In 1919 exports fell to half their former volume but were completely restored in 1920. Not until the world-wide depression of the next year did trade once more languish, to the accompaniment of labor troubles and disorders.

The end of the administration of Juan Luis Sanfuentes (1915-20), Conservative coalition leader, brought on an election campaign which revealed how widely liberal tendencies had spread. The campaign was fought between Arturo Alessandri, candidate of the Liberal Alliance, a bloc of middle-class and working-men's parties, and Luis Barros-Borgoño, the representative of the governing bureaucracy. The returns gave Alessandri 179 electoral votes to Barros-Borgoño's 175, but, because of several contests and the tense political feeling, Alessandri's victory was not assured until a special Court of Honor found for him a vote of 177 to 176 (Oct. 4, 1920). The new president was committed to a reform programme that included administrative decentralization, qualified woman suffrage, separation of church and state, an income tax, a labor code, and state control of the nitrate industry. He found it, however, almost impossible to make progress with these reforms, which met with such opposition from the conservative elements in Congress that even the necessary routine functions of government could hardly be carried on. To quiet the political turmoil, the President, on Jan. 7, 1924, dissolved Congress; but a compromise was effected and on February 9 the Senate, in return for acceptance by Alessandri of a limitation on his power to suspend Congress, passed a number of measures, including an income-tax law, which he particularly desired. The Congressional elections of March, 1924, upheld his liberal policies and, when Congress met on June 1, the Government had a majority in both Houses; but the hopes for harmony which such a state of affairs aroused were soon dissipated. Congress seemed to have become merely a battlefield for political factions. Little or no legislation of value could be passed, government finances were demoralized, salaries of government officials were left unpaid, and no revenue was in sight to meet the heavy and growing deficit. Failure of a bill increasing military pay brought matters to a head. On September 4, a group of army officers presented an ultimatum demanding the immediate passage of certain measures. Although the President and Congress promptly complied and the existing ministry resigned, and although a little later the military group issued a statement saying that no military or other dictatorship was intended, it was recognized that the powers of government had definitely passed into new hands and a bloodless revolution had been brought about. President Alessandri left the country on a six months' "leave of absence." A *Junta de Gobierno*, or committee of government, headed by General Luis Altamirano, appointed a cabinet containing both military and civilian ele-



ments (September 12), and announced a general election of President and Congress for the following May 10, 1925.

With Congress dissolved, the new government, through a series of decree laws, entered on a vigorous programme of reform measures affecting the whole life of the country; but its progress was halted abruptly when a new *coup d'état*, Jan. 23, 1925, placed a second military group in control. The two factions came near to civil war but were brought together under a plan by which military, naval, and civilian elements were represented on a new *Junta*.

Immediately after the *coup*, President Alessandri had been invited to return and resume the Presidency. He replied from Venice, Italy, consenting to do so provided the military should return to their proper duties, a constituent assembly should be called to revise the constitution, new election laws should be passed, and a non-partisan civil government should be established. These conditions having been agreed to, he returned on March 20 and was enthusiastically received. He at once set about the task of placing the government on a constitutional basis by appointing a committee to propose changes in the existing constitution. Labor troubles marked this unsettled period. A general strike in Valparaíso in February for a while paralyzed business, and later outbreaks of workers in the nitrate regions brought the military into action and resulted in the banishment of a number of radicals to the island of Juan Fernandez.

A more auspicious development in 1925 was the adoption of plans for stabilizing Chilean finance. A financial mission headed by the American, Prof. E. W. Kemmerer, made an exhaustive study of the country's finance and advanced a number of recommendations. As a result, a central bank was created (August 21) and a law was signed (September 16) establishing as the country's monetary unit the gold peso of 0.183057 grams fine, valued at about 12 cents, United States currency, or at the rate of 40 to the pound sterling. After many years of instability, Chilean currency was thus at last put on a gold basis.

In July, the constitutional committee made its report. It recommended a revised constitution whose central feature would be a concentration of power in the hands of the President. Ministers were made responsible to the President only. The President's term was made six years instead of five, and he was to be elected by direct popular vote. Other provisions separated church and state, centralized financial control, etc. In August, a plebiscite overwhelmingly approved the new constitution. Before the election of a new President could be held (as provided for in the constitution), political feeling ran very high over candidacies, and, as one result, President Alessandri resigned. The leading factions at length agreed upon former President Figueroa and he was elected (October 24) by a large majority. This result, however, failed to bring the public peace of mind so much desired. Strike riots in Santiago followed the election and were symptomatic of a restlessness of labor which was always threatening to break out in disorders.

During the following year, this feeling was reflected politically in tense parliamentary situations, the radical and labor elements being opposed by the military. Leading the army group

was the Minister of War, Col. Carlos Ibáñez, a forceful figure destined to dominate the politics of Chile for years. Early in 1927, Colonel Ibáñez took a series of steps which, by mid-year, had placed him in the Presidency with the powers of a dictator. In February, he became Premier and Minister of the Interior, and in April, Vice President, with practically full control. President Figueroa resigned and, in May, elections were held to choose his successor. Colonel Ibáñez was elected by a great majority. As his power grew, he waged vigorous war on all communistic and disloyal influences as well as corruptionists, his professed aim being the promotion of an intense, even an austere, nationalism. His measures were often drastic. Early in 1927, he banished a large number of communists to the island of Mas-a-Fuera and in 1928 also deported to the same uninviting place bands of "red" agitators. Other political opposition was crushed by the summary exile of various leaders, most prominent of whom was former President Alessandri. Measures were taken to weed out of the schools and the government service all persons suspected of being in sympathy with radicalism. As a result of these measures, a new national spirit was evoked which greatly stimulated many lines of activity. Trade and industry revived, the financial situation improved, unemployment decreased.

In the field of international relations, the post-war period was for the most part uneventful except for one all-important development, the attempt over several years to settle the Tacna-Arica question. In 1919, at the request of the Council of the League of Nations, Chile joined the League, and had the pleasure of seeing Augustin Edwards, Chilean Minister to London, elected president of the third League Assembly in 1922. In the spring of 1923, the Fifth Pan-American Conference was held at Santiago. The chief controversial issue, disarmament as between the A. B. C. powers of South America, was left unsettled and the failure to reach an agreement caused much disquietude in Chile, as the country was spending an average of 22 per cent of its budget on defense. On Feb. 24, 1927, Chile and Italy signed a treaty in which a method was outlined for settling any future disputes that might arise.

Chile's international concerns, however, centred almost wholly on the Tacna-Arica problem, a rankling source of trouble since the Treaty of Ancon in 1884. That treaty provided for a plebiscite to determine the ownership of the two obscure provinces, Tacna and Arica, which have no economic importance with their area of only 26,036 square miles and population of 39,000. Negotiations in 1920 and 1921 ended in an impasse. In July, 1922, both governments agreed to accept the President of the United States as arbitrator and agreed further that if a plebiscite was determined upon, the President was to fix the conditions under which it would be held. President Coolidge announced his decision in March, 1925. It called for a plebiscite, with payment of 10,000,000 pesos to the losing country as provided in the Treaty of Ancon. A plebiscite commission of three, made up of one representative of Chile, one of Peru, and one member, the chairman, to be appointed by the President of the United States, was to supervise the preparations for, and the holding of, the plebiscite. The award also decided that the province of Tar-

apa rightly belonged to Peru, and Chile acquiesced. Gen. John J. Pershing, U. S. A., was selected as the American member of the commission, which organized at Arica on August 4. Friction presently developed, particularly over the date of the plebiscite, which Chile insisted should be held without delay, and, later, over alleged misuse of her administrative powers by Chile to prevent a fair vote. Chile's delegates remained away from many meetings of the commission. On December 9, the commission announced February 15 to March 15 as the registration period and April 15 as the date of the plebiscite. General Pershing resigned and was succeeded on January 13 by Gen. William Lassiter, U. S. A. Although registration of voters began, the plebiscite date was postponed and it became evident that the whole plan had fallen through. In November, 1925, Secretary Kellogg, of the United States Department of State, made a further effort to effect a settlement by submitting a concrete proposal, assigning the two provinces to Bolivia, but it proved unacceptable. President Ibáñez favored direct negotiations between Peru and Chile and they were carried on into 1929. Just when they seemed to have reached an impasse, it was announced at Washington (May 10, 1929) that through the good offices of President Hoover a settlement of the long-drawn-out controversy had been reached. The terms of the settlement gave Tacna to Peru, and Arica to Chile. Chile was to pay to Peru \$8,000,000 and was to grant to Peru a wharf, customhouse, and railway station at Arica. Bolivia and her desire for an outlet to the sea were not mentioned in the settlement. See TACNA ARICA CONTROVERSY. In July, 1929, Chile ratified the Kellogg Peace Pact.

**CHINA.** China proper consists of the 18 provinces, about 2,000,000 square miles in area, Chihli, Shansi, Shantung, Kansu, Shensi, Honan, Anhwei, Kiangsu, Chekiang, Kiangsi, Hupeh, Szechwan, Kweichow, Hunan, Fukien, Kwantung, Kwangsi, and Yunnan; and the dependencies of Manchuria, Mongolia, Sinkiang (Chinese Turkestan), and Tibet—a total area of 4,282,000 square miles. The exact population is un-

known; estimates vary from 325,000,000 to 445,000,000. China, therefore, has a density of population of from 80 to 100 per square mile and about 175 for China proper; Shantung had 528 to the square mile; and Kansu, 40. Six-sevenths of China's population, however, live on one-third of its area and are concentrated generally along the coasts and in the huge delta plains of the three great rivers, the Yellow in the north, the Yangtze in the centre, and the West River in the south.

**Agriculture.** No reliable statistics of production in China are available. The only reliable clue to production is the surplus exported and regularly recorded by the Maritime Customs, under foreign control. The following estimate of China's production of chief crops is based on observation by reliable authorities: silk, 100,000,000 pounds; rice, 600,000,000 bushels; wheat, 200,000,000 bushels; soya beans, 150,000,000 bushels, 70 per cent Manchurian; Han cotton, 2,200,000 bales; Kaohang corn, 200,000,000 bushels; maize, 100,000,000 bushels; millet, 100,000,000 bushels; peanuts, 200,000 tons. Soya beans and raw cotton showed remarkable increases following 1913. Other crops remained the same.

The following tables give a comparison between the exports and imports of China for the years 1913 and 1926. It will be noted that despite the years of the World War and the almost continual struggle for supremacy in the civil war in China, with its political agitation, military operations, commandeering of transportation facilities, labor disputes, boycotts, and currency depreciation, the dollar value of imports and exports has more than doubled.

The combined value of China's export and import merchandise trade in 1927 was \$1,332,770,000, representing exports of \$656,864,000 and imports of \$675,906,000. During 1927 the United States supplied 16.2 per cent of China's imports and bought in return 13 per cent of her exports: Japan's shares were 28 and 30 per cent, respectively; Great Britain's (exclusive of Hongkong), 7.3 and 6.3 per cent; Germany's, 3.8 and 2.2 per cent.

## IMPORTS FOR CONSUMPTION BY PRINCIPAL COMMODITIES

Commodity		Quantity		Value (thousands of dollars)	
		1913	1926	1913	1926
<b>Total</b>				416,219	854,408
Fishery products	1000 lbs	196,438	283,766	9,472	10,620
Wheat	1000 bns	5	9,236	4	13,654
Rice	1000 lbs	721,984	2,493,440	13,420	68,282
Wheat flour	1000 bbls	1,787	2,915	7,543	18,021
Sugar	1000 lbs	948,230	1,556,901	26,503	62,495
Tobacco, leaf	"	21,545	100,678	2,608	19,437
Cigarettes	million	6,209	7,739	9,190	15,781
Cotton, raw	1000 lbs	17,965	366,002	2,202	71,250
Cotton yarn	"	358,048	59,904	51,874	21,470
Shirtings and sheetings, gray	1000 pieces	9,549	3,773	22,103	17,180
Shirtings and sheetings, white, plain	1000 pieces	4,491	2,932	13,831	16,284
Drills and jeans, gray and white	"	4,012	2,319	10,666	8,890
Gunny bags	1000 lbs	(*)	135,260	(*)	11,355
Timber, softwood	1000 sq. ft	184,848	304,710	2,948	8,800
Paper and cardboard		.....	.....	5,284	21,028
Coal	1000 tons	1,691	2,898	6,877	20,469
Kerosene	1000 bbls	4,381	5,547	18,544	43,012
Iron and steel sheets and plates	1000 lbs	123,571	221,267	3,724	8,742
Copper ingots and slabs	"	26,765	13,112	4,475	1,882
Machinery, electrical		.....	.....	2,221	8,958
Machinery, other		.....	.....	6,389	14,177
Chemicals and fertilizers		.....	.....	5,364	15,990
Indigo, synthetic	1000 lbs	42,610	45,396	7,032	9,527
Silver <sup>b</sup>		.....	.....	26,257	40,435

\* Not shown separately.

<sup>b</sup> Not included in totals.

## DOMESTIC EXPORTS BY PRINCIPAL COMMODITIES

Commodity		Quantity		Value (thousands of dollars)	
		1913	1926	1913	1926
Total				294,413	656,864
Egg albumen and yolk	1000 lbs	20,796	65,535	2,149	13,863
Eggs, frozen or dried		10,225	66,935	443	8,704
Eggs, fresh or preserved	1000 doz	30,267	63,230	2,055	6,445
Millet and sorghum	1000 lbs	224,291	963,333	2,786	20,189
Beans, yellow (soya)	1000 bus	16,488	43,426	12,030	48,778
Beans, other		6,454	6,715	4,971	8,274
Tea, all sorts	1000 lbs	192,281	111,909	24,774	19,886
Bean cake	1000 tons	703	1,678	18,223	56,406
Cigarettes	1000 lbs	993	11,390	266	11,716
Fur skins	thous	8,780	10,172	1,175	6,124
Hides and skins, raw or tanned				15,269	14,913
Bristles	1000 lbs.	7,029	8,918	3,238	7,956
Cotton, raw		98,508	117,135	11,852	22,344
Wool, sheep's		37,363	27,791	4,006	5,277
Silk, raw		15,913	18,329	48,444	99,399
Silk, raw, wild		3,955	4,146	5,233	10,669
Silk waste		15,581	20,357	4,871	7,988
Cotton yarn		170	25,631	12	8,217
Shirtings and sheetings	1000 pieces	1	1,536	2	6,889
Silk piece goods	1000 lbs.	2,291	2,502	9,827	16,237
Pongees		2,233	2,660	4,846	7,215
Coal	1000 tons	1,489	3,085	4,812	19,903
Tin in slabs	1000 lbs.	18,492	14,579	7,969	6,641
Peanuts		152,193	400,006	3,673	14,086
Sesame seed		271,286	120,195	9,032	5,490
Peanut oil		34,210	109,697	2,068	8,182
Bean oil		65,576	355,631	2,724	22,794
Wood (tung) oil		61,820	99,758	2,921	11,371

**Shipping.** During 1926, 153,996 vessels of 134,659,606 tons entered and cleared Chinese ports. Of these, 5338 of 6,496,351 tons were American; 36,474 of 47,645,090 tons, British; 2262 of 2,321,632 tons, French; 813 of 2,905,127 tons, German; 1045 of 731,499 tons, Italian; 29,654 of 38,948,844 tons, Japanese; 2407 of 3,301,874 tons, Norwegian; 1444 of 447,094 tons, Portuguese. In 1913 the total tonnage which entered and cleared was 93,334,830; in 1921, 114,619,544.

**Railroads.** China had in 1927 only 8750 miles of railroads to cover an area of 4,500,000 square miles. There was practically no new construction after 1913. The 23 different railroad lines form two north-and-south trunk lines, one from Changsha, below the Yangtze, to Peking and one extending from Shanghai to Tientsin and on up to Harbin. There is one east-and-west trunk line, which, when completed, will extend from Lanchow, in Kansu, to Haichow, on the seacoast of Shantung. There are various connecting and disconnected short lines.

**National Debt.** On Oct. 21, 1921, China's national debt was reliably estimated at \$1,814,002,511.88 silver (\$1 silver = about \$.50 gold). In addition, there was at least \$86,000,000 (silver) contracted in concealed debt, treasury notes, and unpaid salaries of officials, or a total of \$1,900,002,511.88. The detail of this debt, which was about \$5 (silver) per capita is as follows: Secured on Maritime Customs and Salt Revenue; general foreign loans, \$267,979,252.34; foreign railway loans, \$334,802,631; foreign indemnities, \$482,841,744; internal long-term loans, \$275,226,738; internal short-term loans, \$69,101,978.54; treasury notes, \$18,640,000; total secured, \$1,449,592,343.88; unsecured: foreign obligations, \$217,047,073; native obligations, \$41,412,078; concealed debt, \$65,000,000; advances on salt, \$40,951,017; additional concealed debt, \$40,000,000; treasury notes, \$14,000,000; salt bonds, \$10,000,000; Dragon Boat Festival notes, \$2,000,000; unpaid

salaries, \$20,000,000; total unsecured, \$450,410,168. An American estimate placed the public debt on Dec. 31, 1925, at \$1,250,000,000. All foreign loans and indemnity obligations secured on the customs revenue were met in full during 1927 and 1928. See below, under *History*, for the establishment of the Nationalist government in 1928 and for the relations of China to the Washington Arms Conference.

**History.** At the beginning of 1914, Yuan Shih-kai was carefully proceeding in the execution of his plans for the reconstruction of the old autocratic government and of the centralization of power. Step by step he emasculated the innovations of Western democracy and parliamentarianism. Outside of the circles of Young China, these measures produced little reaction, for the mass of people were not greatly interested in the Western innovations which ran counter to their instincts and customs, and, after all, they were tired of being looted in the name of liberty. It was only when the President decided to perform henceforth the Winter Solstice sacrifice at the Temple of Heaven that the people began to take notice, because by performing this ceremony, the symbol of the old emperor's function in the state, he practically proclaimed himself an autocratic ruler. This policy of Yuan Shih-kai was strikingly demonstrated by the presidential mandates, especially the Presidential Election Law of December, 1914, whereby the President's term of office was lengthened to 10 years. Deftly Yuan Shih-kai's astute statesmanship restored the authority of the central government, at the head of which he ruled as undisputed dictator.

If the restoration of the monarchy and the realization of Yuan Shih-kai's designs on the throne had been merely matters of internal politics, they would probably have succeeded; but questions of foreign policy intervened to frustrate Yuan's schemes. After the capture of Kiaochow, the Japanese government presented, on Jan. 18, 1915, a protocol embodying the notori-

ous Twenty-one Demands, the fulfillment of which would have meant the most serious infringement of Chinese sovereignty that had occurred thus far. (See JAPAN and SHANTUNG.) After four months of negotiations, in which Yuan Shih-kai took the stand that acceptance of the demands would tend to impair China's sovereignty and the treaty rights of other Powers, the Chinese Foreign Office was compelled, by a 48-hour ultimatum, to accept most of the Japanese demands, in slightly modified form. As originally presented, the Twenty-one Demands were grouped in five sections. The first section required the Chinese government's full assent, in advance, to whatever settlement Japan and Germany might make regarding the disposition of German rights in Shantung, the opening of additional commercial ports in Shantung, and the construction of a branch from the Shantung railway to Chefoo or Lungkow.

These stipulations were accepted with very little alteration and embodied in a treaty and several notes, signed on May 25, 1915. In return, Japan agreed to return the leased territory of Kiaochow Bay to China, after the War, if certain conditions were fulfilled. (See PEACE CONFERENCES and SHANTUNG.) Section II, likewise accepted and embodied in a treaty with several supplementary exchanges of notes, strengthened Japan's grip on southern Manchuria and eastern inner Mongolia, by extending the Japanese lease of Port Arthur, Dalny, the South Manchurian Railway, and the Antung-Mukden Railway to 99 years, by granting Japanese subjects the right of leasing or owning land and engaging in any kind of business, by handing the Kirin-Changchun Railway over to Japanese administration, and by assuring to Japan an option on the development of mines, the financing of railways, and the nomination of foreign advisers in these provinces. Section III proposed to convert the Hanyehping Company, the great Chinese coal, iron, and steel concern located at Hankow on the Yangtze, in the British sphere of influence, into a joint Sino-Japanese enterprise with monopolistic control of future mine development in the neighborhood. To this extraordinary demand, China assented in an exchange of notes, but the clause relative to future mining operations was omitted. Section IV embodied a blanket pledge on the part of China "not to cede or lease to a third power any harbor, bay, or island along the coast of China"; this pledge China refused to incorporate in any treaty or note, as such a declaration would have implied a Japanese protectorate.

Finally, Section V, or "Group Five" as it was more commonly called, contained provisions that would have meant the firm establishment of a Japanese protectorate over China; China was to employ "influential Japanese as advisers in political, financial, and military affairs"; Japan was to have a share in the police administration "of the important places in China"; China was to purchase "say 50 per cent" of her war munitions from Japan, either directly or through a Sino-Japanese arsenal. Furthermore, Japanese were to be allowed to propagate religious doctrines, i.e., Buddhism, in China; Japanese hospitals, churches, and schools were to be given the right of owning land; Japan was to build certain railways in the Yangtze Valley, again infringing on the British sphere of influence; and Japan was to have an option on supplying capital for mines, railways, har-

bors, and dockyards in Fukien Province. To Group Five, the Peking government resolutely refused assent; the most that could be conceded was an exchange of notes stating that China had not given any foreign nation permission to construct military or naval works on the Fukien coast. There had been rumors of an agreement for such construction by the Bethlehem Steel Company.

Although the other items in Group Five were temporarily dropped, the Japanese government merely postponed them "for future discussion"; and they may be regarded as significantly expressive of the imperialist aims of the Japanese government in 1915. The net result of China's partial acquiescence in the Twenty-one Demands of 1915 was to fortify Japan's privileged position in her spheres of influence—south Manchuria, eastern Mongolia, Shantung, and Fukien—and to open the heart of the rich Yangtze valley to Japanese economic penetration. The attitude of the United States Government toward the Japanese manœuvre was set forth in identical notes to China and Japan, May 9, stating that the United States could not recognize any agreements impairing treaty rights, the integrity of China, or the Open Door; and as Secretary Bryan had already issued a statement to the press on May 6, expressing his hope that the agreements might be mutually "satisfactory" and contribute to the "prosperity" and "cordial relationship" of "these great Oriental empires," it was obvious that the United States, while formally supporting Chinese integrity, was not disposed to offer any determined opposition to Japanese aggression.

These events served to make it clear that in any fundamental change in the Chinese government, such as the restoration of the monarchy, Japanese intervention would have to be reckoned with. When, therefore, the State Council referred the question of the monarchy to a vote of the provinces, in October, 1915, the Japanese Minister in Peking, supported by his British and Russian colleagues, "offered friendly advice" on behalf of his government against the restoration of the monarchy. This intervention of the Powers, especially of Japan, sealed the fate of Yuan's aspirations to the throne. Although the provinces registered a unanimous vote in favor of his accession on Nov. 5, 1915, the proclamation of the monarchy on December 12 was followed almost immediately by an insurrection, which rapidly accumulated speed and became general. The Southern leaders set up a provisional government at Canton and hailed as president the former Vice President, Li Yuan-hung. After many and prolonged manœuvres to save his face, Yuan Shih-kai died on June 5, 1916, of a broken heart, as it was said. Li Yuan-hung became President, and Tuan Chi-jui, Premier, of the Chinese Republic.

If Yuan's death was universally regarded as a temporary solution of China's great internal problem, it proved almost at once to be quite the opposite. After his death, conditions in China became rapidly more chaotic. The new Peking government made a show at parliamentary government by convening the Parliament of 1913 for Aug. 1, 1916. Its measures, however, did not tend to produce any coöperation from the Southern or Canton government. The essential difference between the two camps was that Peking was dominated by the military party, a combination of military governors and shrewd

politicians, in which the former used the latter for their purposes, whereas Canton represented the Kuo Min-tang Party and Young China with their exuberant enthusiasm for Western democracy.

During the remainder of 1916 the political and financial situation grew more disorganized. Then came the entry of China into the World War. On Mar. 14, 1917, Allied influence (supported by persuasion from the United States), finally prevailed over German intrigue and the Peking government severed relations with Germany. The Premier and the military party insisted upon waging war actively but were held back by President Li, the Kuo Min-tang, and the Canton chieftains, who favored a declaration of war by parliamentary procedure. President Li dissolved Parliament unconstitutionally, and, on May 23, 1917, dismissed Premier Tuan, who thereupon set up a provisional government in Tientsin supported by the military governors, or Tuchuns. When, on June 6, the United States intimated in a note that internal unity was more important than a declaration of war, Japan, which was generally regarded as controlling Tuan, resented the move. At this juncture, a new force appeared. On June 12, General Chang Hsün arrived before Peking with an army and, after 18 days of apparently satisfactory meditation, suddenly restored the Manchu Emperor to the throne. But the rule of the young Son of Heaven lasted only 12 days. From Tientsin, Tuan Chi-jui marched on Peking with troops supplied by the Tuchuns and the republican South, ejected Chang Hsün and the Emperor, and reestablished the Republic. Resuming the premiership, Tuan, on July 18, replaced Li Yuan-hung as President with Vice-President Feng Kuo-chang. A formal declaration of war on Germany followed, on Aug. 14, 1917. It involved the sequestration of German property, the uprooting of German financial and commercial interests in China, and, as a reward from the Allies, a loan of 10,000,000 yen, secured by the salt revenues (gabelle), and a suspension of Boxer indemnity payments.

Submissive to Japan, the new Government enjoyed relatively strong authority. But the Southern faction, opposing the militarism of the Peking government and especially a declaration of war without action by Parliament, revolted in June, 1917, and set up a new government in Canton headed by Dr. Sun Yat-sen who had traveled and studied extensively in the West. Premier Tuan's desire for strong military measures against the rebellious elements was opposed by President Feng and a hopeless tangle ensued, with war between North and South (in which some provinces remained neutral), conflict between the Peking leaders, and independent action by the Northern Tuchuns. Premier Tuan finally had his way and the war against the secessionists was waged, with fluctuating success, during the remainder of 1917 and the first half of 1918. To preserve a semblance of constitutionality, Tuan convened an assembly for a revision of the electoral law. On the promulgation of this law, on Feb. 17, 1918, the new Parliament was elected, which, on September 4, chose Hsü Shih-chang as President to replace Feng Kuo-chang, who had proved unsatisfactory to the Anfu Club. The new President made a sincere effort to end the civil war and on Nov. 16, 1918, ordered the Northern commanders to withdraw from Southern territories. This armistice was

followed in the spring of 1919 by a peace conference at Shanghai, which, however, achieved nothing.

Under Tuan Chi-jui and the Anfu Party, China became powerless in the hands of the Japanese, since the Allies were too preoccupied with the World War to interfere. In March, 1918, the Peking government concluded military and naval agreements with Japan whereby the Japanese, under the pretext of action against a Bolshevik danger, obtained a complete hold on Northern China, including control of the Chinese Eastern Railway and Northern Manchuria. At the Peace Conference, Japan's actions with regard to China during the War received the official indorsement of the Allied Powers when Lloyd George and Clémenceau, in accordance with secret pledges given to Japan in 1917, and President Wilson, in order to save the League of Nations, and relying on the Japanese promise eventually to excavate Shantung, accorded Japan all the former German "rights, title, and privileges in the province of Shantung." (See PEACE CONFERENCES.) The Chinese delegates, supported by Chinese public opinion, pleaded their case with ardor and ability and refused to sign the Versailles Treaty, which contained the article relating to Shantung. The decision of the conference aroused vehement indignation in China, which Young China successfully employed to launch an anti-Japanese movement. The general disappointment and resentment of the Chinese people, who derived some comfort from the fact that the United States refused to ratify the Treaty, were directed primarily against the ruling Anfu Party, the pro-Japanese policy of which was blamed for the national misfortune. Although, in the great excitement, the guilt of that political clique was greatly exaggerated for reasons of internal policy, there was nevertheless much cause for such feeling, since the position of the Chinese delegation at the conference had been seriously injured when it became known that the Tuan government had concluded, in the fall of 1918, a secret agreement whereby Chinese rights with regard to Shantung had been practically surrendered. In the summer of 1920, the anti-Japanese movement, under the influence of the agitation of the students, drove Tuan Chi-jui and the Anfu Club from the government. The Anfu leaders took refuge in the Japanese Legation, and some of them fled subsequently to Japan to escape popular wrath.

Japan worked hard to consolidate her position in China, but after the Peace Conference the Powers were once more able to devote their attention to Far Eastern affairs, and subsequent events brought about a partial modification of the Japanese policy in China. The new Peking governments were less subservient to Japan than the Anfu leaders and strove to recover some of the ground lost during the War. Repeated attempts on the part of Japan in 1920 and 1921 to come to an agreement with China regarding Shantung, by offering to restore the territory provided certain concessions were granted her, failed because of Peking's steadfast refusal to consider anything short of almost unconditional evacuation. At the Washington Conference (see WASHINGTON CONFERENCE) at the end of 1921, the Chinese delegation insisted on bringing the Shantung question before the Conference. The Japanese, on the other hand, wanted to negotiate with the Chinese directly, for this would have confirmed the tacit Japanese contention, contained also in the Lansing-Ishii Agreement,



that China was in fact an informal Japanese protectorate. The Conference decided on a compromise by conceding the Japanese demand but providing for Anglo-American mediation in case of deadlock. When the deadlock actually took place, the English and American mediators, influenced by public opinion at home, brought pressure to bear on the Japanese to give way. The Shantung Treaty which was signed by Japan and China early in 1922 provided for the restoration to China of the former German Leased Territory of Kiaochow and all public properties therein, together with the Tsingtao-Tsinanfu Railway and its branches, the value of the railway properties being reimbursed to Japan by China. The conference reached, in addition, numerous other agreements of primary importance to China. See SHANTUNG and WASHINGTON CONFERENCE.

The lapsing of the Anglo-Japanese Alliance as a result of the conclusion of the Four Power Treaty, it is widely believed, should affect China greatly in the future, inasmuch as in consequence thereof Great Britain will be inclined in the future to coöperate with the United States rather than with Japan in regard to Chinese affairs. The surrender by the Japanese of Kiaochow Bay induced the British to promise to relinquish the Leased Territory of Wei-hai-wei. Provisions were made also for a revision of the customs schedule and for the abolition of the foreign post offices in China. The conclusion of the Nine Power Treaty reaffirming the Open Door and the integrity of China brought with it also the abrogation of the Lansing-Ishii Agreement.

In general, the Washington Conference resulted in a material improvement of the Chinese situation with reference to the Powers. Whether it was due to pressure from the Powers or to a voluntary new orientation of Japanese policy, Japan seemed to modify thereafter her policy of encroachment on Chinese territory and sovereignty. By far the most important result of the Washington Conference with regard to China, however, was the adoption of the open-door policy, which, in substance, amounts to a concerted exploitation of China by the Powers as over against competitive exploitation based on spheres of influence in the past. This development is to be ascribed directly to the efforts of the United States. The Chinese Loan Consortium and its workings were part and parcel of this policy. An agreement had been arrived at, in October, 1920, whereby combined financial supervision over China had been provided through the establishment of the Four Power Consortium to represent banking interests in the United States, Great Britain, France, and Japan. The chief points in the arrangement were the establishment of an international board for the abolition of special spheres of influence, insistence on the disbanding of troops, and the combining of all railway concessions into a large Chinese railway system financed and supervised by the consortium.

After the fall of Tuan Chi-jui and the Anfu Club from power, the Government passed into the hands of the Chihli faction, the ruling politicians of which renewed the old struggle for spoils on a still greater scale. General Wu Pei-fu, who had been an important factor in the defeat of the Anfu Club, and who had come to the fore with a proposal for a national convention, was deftly pushed aside. A few powerful

super-Tuchuns, chief of whom were Tsao Kun and Chang Tso-lin, reduced the authority of the central government to a mere shadow, removing the figurehead officials at will. In the South, the situation was hardly more hopeful. The Canton government had become disrupted and intermittent fighting took place between Sun Yat-sen, his former lieutenant, Chen Chiung-ming, and other factional leaders. In 1922 a struggle for supremacy broke out among the Northern Tuchuns. Wu Pei-fu, lord of the Yangtze, opposed Liang Shih-yi, who was a creature of Chang Tso-lin, lord of Manchuria.

In the fighting that ensued between Chang and Wu, the powerful Manchurian Tuchun was defeated and driven back to his own province. The victory made General Wu a dictator. He forced President Hsü Shih-chang and the cabinet to resign and recalled former President Li Yuan-hung and the twice-dissolved Parliament of 1917. In view of Li's reputation as a defender of parliamentary rule and of General Wu's supposed liberal tendencies, these developments gave rise to hopes for the establishment of orderly and constitutional government.

These hopes were sadly disappointed; neither President Li nor Parliament (nor the Cabinet), which was composed of leaders of Young China, were able to cope with the situation, and it was evident that General Wu's good intentions had been grossly exaggerated. The Tuchun rule remained essentially as before, with the three powerful leaders, Wu Pei-fu, Tsao Kun, and Chang Tso-lin striving for supremacy. Relations between North and South likewise continued hostile, but both General Wu and Dr. Sun Yat-sen were each prevented from advancing against the other's capital by rivalry in their own territories. Slowly, however, two large hostile camps evolved, the Northern group under Wu Pei-fu and Tsao Kun, with Chen Chiung-ming in the South as collaborator, and the Southern group, led by Dr. Sun Yat-sen, who counted on the aid of Marshals Chang Tso-lin and Tuan Chi-jui in the North.

In 1923 Peking again changed masters, when President Li Yuan-hung was forced out by the militarists and fled to Tientsin and then to Shanghai, where, in conjunction with 200 members of Parliament, he attempted unsuccessfully to form a provisional government. He later found an asylum in Japan. The Presidency remained unfilled until October, 1923, when Marshal Tsao Kun (by wholesale bribery, it was claimed), induced enough members of Parliament to return from Shanghai to form a quorum and elect him to the office. He thus emerged as the most powerful factor in the North and, on the whole, used his new authority well. Immediately after his inauguration, he persuaded Parliament to adopt a new constitution providing for far-reaching provincial decentralization. He faithfully supported Wu Pei-fu in his successful campaign against the South which, in the spring of 1924, brought a large portion of southwestern China under Northern control. For a brief space, the country came near being unified, nominally at least, under one central authority. Only Manchuria and the provinces of Chekiang, Kwangtung, and Yunnan refused to acknowledge the authority of Tsao Kun.

The prestige of the central government was so far restored that it was able to conclude important agreements with two foreign governments. In May, Germany and China came to

terms with respect to financial claims and other matters. Against Chinese reparation claims, Germany surrendered large blocks of pre-war railway bonds and bonds of the reorganization loan of 1913, while China released unsold German property sequestered during the war and permitted the reestablishment of the Deutsche-Asiatische Bank. On May 31, after months of negotiation, China signed a series of agreements with Russia providing for recognition of the Soviet government, the right of China to purchase the Chinese Eastern Railway, renunciation by Russia of extraterritorial rights and of Boxer indemnity payments, return to Russia of legation and consular buildings, etc. In June, 1924, the United States Congress passed a law remitting all further payments on the Boxer indemnity obligations.

In September, civil war again raised its head in the North. Chi Hsi-yuan, in control of Kiangsu Province, and Lu Yung-hsiang, Governor of Chekiang, began fighting each other for the possession of Shanghai. Their little war soon drew in the big leaders. Marshal Chang Tso-lin took up the cause of his ally Lu, and Wu Pei-fu made common cause with Chi. Other leaders throughout China showed their sympathy with one side or the other. Dr. Sun Yat-sen taking side with the Manchurian overlord. Chang Tso-lin marched on Peking and Wu Pei-fu came up with large forces to defend the capital; but before they met in a decisive engagement, the issue was decided in a totally unexpected manner. Wu's general in command in Peking was the so-called Christian general, Feng Yu-hsiang, whose rigid discipline and insistence on moral conditions in his army gave him what were reputed to be the best troops in China. On being ordered to attack the Manchurian forces, he suddenly deserted Wu, took over the control of Peking, and formed a new government. Wu held out for a few days but was compelled to retreat and his army disintegrated. Chang Tso-lin and Feng Yu-hsiang, temporarily allies, placed Tuan Chi-jui at the head of the government, but with the title of Chief Executive instead of President. He announced a new constitution and a provisional government and called a reorganization conference to meet in 1925.

When Sun Yat-sen came north and conferred with Marshals Feng, Tuan, and Chang, hope for a central government with authority over the whole country was once more renewed; but the hope again proved illusory. On Feb. 1, 1925, the reorganization conference met, but its eleven weeks of secret sessions accomplished very little. In the midst of it, on March 12, Dr. Sun Yat-sen died. He was the leader of the Kuo Min-tang, and had been the central figure of the whole revolutionary movement and the moving spirit in the overthrow of the Manchu dynasty. In 1911 he had been chosen first President of the Republic but had stepped aside in favor of Yuan Shih-kai, who surpassed him, he thought, in administrative ability. Throughout the year, the political situation continued unstable, although no clashes involving the major leaders occurred until toward the close of the year.

In another field, however, outbreaks and turbulence with a far-reaching effect marked the year 1925. Throughout these troubled years of incessant civil war, two developments in Chinese life calculated to bring increasing conflicts with foreign interests in the country had

been growing more pronounced. One was the spirit of nationalism, more or less closely allied at first with a deep interest in the radical theories of Moscow. It found its chief expression in the activities of the Kuo Min-tang and the Canton government, but it permeated the North as well and influenced the policies of the various Peking governments. The other development was the steady and continued industrialization of China. Factories and mills multiplied, particularly along the coast and the inland transportation arteries, bringing in their train a revolution in the mode of life of millions of Chinese. A large part of these mills were capitalized and operated by foreigners, though they employed Chinese labor.

Without the restraints of factory laws or an informed public opinion, this rise of machine industries repeated many of the worst evils that marked the industrialization of England a century before. Children of five and six years of age often worked 12 hours a day, while wages even for adults hardly sufficed in many cases to support life. These conditions induced a rapid unionization of labor, whose solidarity was strikingly evidenced in such events as the Hong-kong seamen's strike of 1922, which tied up shipping along the coast. Labor restiveness, anti-foreign feeling, and an awakening national consciousness combined, in 1925, to produce a state of public mind which observers felt to be increasingly charged with danger.

On May 30, 1925, the expected outbreak came. A Japanese overseer had killed a Chinese laborer in a Shanghai mill, and when a parade of strikers and students, organized in protest, grew threatening, they were fired upon by Sikh police of the International Settlement on the order of a British police officer. Nine Chinese were killed and twenty wounded. These and further killings in the rioting that followed in the next day or two kindled a flame which swept over the whole country, rousing the Chinese against all foreigners, but particularly against the British and the Japanese. Strikes and boycotts against British and Japanese goods were declared, and demonstrations in Peking and many of the treaty ports caused much further loss of life. On June 2, American, British, and Italian marines were landed at Shanghai from cruisers and gunboats which had rushed to the scene and the International Settlement was made ready for a siege.

For a while, the situation was extremely tense. A general strike tied up business of all kinds, the merchants even closing their doors; but the intense feeling of the Chinese gradually eased off, and by June 27, normal business could resume again. In other cities, however, the wave of anti-foreign agitation did not so quickly subside. It reached its height in Canton. A great parade of Chinese on June 23, in protest against the Shanghai killings, passed the Shameen, the foreign district, and when firing began on one side or the other, British and French marines turned their machine guns on the demonstrators, killing and wounding between 100 and 200 Chinese participants. A French civilian was killed and three other foreigners were wounded. While there was no further violence, the hostility of the Chinese found expression in a stringent boycott against British trade in Hongkong which lasted for 15 months and for a time practically paralyzed foreign business. Many months later, the

British Government was obliged to arrange for a loan of £3,000,000 to Hongkong to help the city over the crisis. In other parts of China, anti-foreign demonstrations and rioting continued throughout July but gradually subsided into the more peaceful form of boycotts and strikes. The Shanghai shootings, however, were branded deep in the national consciousness and immensely furthered the cause of the Nationalists.

Parallel with this popular growth of national feeling, a series of moves were being made on the international board tending to remove something of the stigma of helplessness which foreign powers had so long held fastened upon China. The tendency in that direction had been particularly marked since the Washington Conference. On Dec. 10, 1922, Japan returned Tsingtao to China against the payment of 14,000,000 gold yen. The Tsingtao Railroad was returned on Jan. 1, 1923, on China's promise to compensate Japan in due time by the payment of 53,000,000 gold marks. A Chinese note of Mar. 10, 1923, requesting the abrogation of the Sino-Japanese Treaties and Agreements of the spring of 1915 was met by Japan with a blunt refusal. (See JAPAN.) Japan maintained her hold on Inner Mongolia and Manchuria and, in the latter province, she was generally credited with being the support of Chang Tso-lin in his open defiance of the Peking government and his wars on other Tuchuns. (See MONGOLIA and MANCHURIA.) The restoration of Wei-hai-wei by Great Britain and of Kwang-chow-wan by France, as promised at the Washington Conference, had not been effected by the summer of 1929, partly because of failure of Great Britain and China to agree on terms of surrender, and in the case of France, partly because of failure to settle the Boxer indemnity dispute.

Whatever impulses the Western powers may have had toward a more liberal attitude in these and other matters, were held in check by the absence of a strong and authoritative government. In particular, this lack of control resulted in two administrative difficulties which served as constant international irritants. These were financial disorders and the bandit problems, due directly to internal strife and Tuchun rule. The Peking government found it increasingly difficult to collect revenues for carrying on the administration and for paying outstanding foreign obligations. The military governors in the interior withheld the taxes and used them for their own selfish purposes, while certain lucrative revenues, such as the customs duties and the income from the salt gabelle, were pledged as securities for foreign loans. At the same time, the financial supervision of the consortium struck a snag because the Chinese government refused to give the guarantees which were regarded as absolutely necessary for the stabilization of Chinese finances.

The bandit problem was no less vexing. Endless civil wars and Tuchun rule had resulted in a tremendous increase of the mercenary soldiery fighting for one or the other of the many factions. On the failure of the chieftains to pay their undisciplined hosts, or on their disbanding, these soldiers resorted with arms in hand to open banditry. For lack of authority, the central government was either unable or unwilling to cope with the situation. Consequently, murder, rape, and robbery were almost daily occurrences. Many cases of kidnaping of

foreigners, particularly of missionaries, took place during these years of turmoil.

The most flagrant instance was the derailing of the Shanghai-Peking Express on May 6, 1923, which resulted in the abduction of some 300 passengers, including 20 foreigners. This affair elicited sharp protests from the Powers. After dilatory tactics on the part of the Peking government, the foreign prisoners were released some months afterward. Claims for damages were filed, but it was not until Feb. 21, 1925, that the Peking government settled the most important of these claims by paying \$300,000 in silver to the dean of the diplomatic corps. The American claims covering material and moral damage amounted to \$144,000.

This same year of 1925 saw also other important steps taken to bring greater harmony in the relations of China with the Powers. The long-drawn dispute with France referred to above, which arose when China insisted on paying her Boxer indemnity obligations in depreciated French paper instead of gold francs, was settled, on April 12, by an agreement under which unpaid installments were to be used to rehabilitate the Banque Industrielle de Chine and payments due in the future were to constitute a loan to the Chinese government in terms of American dollars. On June 30, Great Britain provided for the use of future Boxer indemnity payments for purposes mutually beneficial to the two nations.

With the settlement of the dispute with France, that country ratified the treaties of the Washington Conference relating to China, and the way was finally cleared for carrying out the treaty provisions calling for a conference of the Powers for the purpose of raising Chinese customs duties, in general, from 5 per cent to 7½ per cent. This conference met October 26, and the Chinese delegates immediately presented a demand for full tariff autonomy. This was eventually conceded by the Powers, with the effective date set at Jan. 1, 1929, and with insistence by the Powers that "likin" taxes were to be abolished at the same time; but disagreement as to interim rates kept the conference in session over many months. The Chinese delegates ceased to attend the sessions and the conference finally faded out without settling the question; but both the Peking and the Canton governments, over the protests of the Powers, in due course placed the 2½ per cent surtax on imports.

Another provision of the Washington Treaties was carried out when the signatories followed Secretary Kellogg's initiative in appointing representatives to an extraterritoriality conference. This conference met in Peking Jan. 12, 1926, and continued its investigations for eight months. On September 16, it made its report, which included recommendations that the Powers might consider the progressive abolition of extraterritoriality privileges when China had adopted specified reforms in her judicial system, and pending such action that Chinese laws should be followed, so far as practicable, in the procedure of the extraterritorial courts.

While these efforts at adjustment with the Washington Conference participants were in progress, Russia had been pursuing a policy of her own toward both the North and the South. Russian influence and aid were effective factors in promoting and maintaining the Kuo Min-tang. In July, 1925, General Borodin, Russian Com-

munist, was appointed adviser to the Nationalist government. While his connection with the Russian government remained for a while unknown to the public, it was later disclosed that the Russian Embassy was supplying him with funds. Following the agreements of 1924, Russia made her Peking representative an ambassador; but relations with the Peking government were of an uncertain friendliness. The open sympathy of the Russian authorities with the Kuo Min-tang brought very strained relations with such Northern leaders as Chang Tso-lin, who was bitterly opposed to Communism. It led to a raid on Russian Embassy buildings in April, 1927, and the seizure of secret documents, and to much friction over the control of the Chinese Eastern Railway.

In June, 1926, China took a significant step when she gave notice to Belgium that the Treaty of 1865, due for revision in October, would be abrogated. This was the first of the long string of "unequal treaties" which China attempted to cancel. These treaties were a major grievance with all Chinese factions, since it was through them that foreign nations, large and small, enjoyed numerous privileges predicated on Chinese weakness. They included extraterritoriality privileges, maintenance of foreign postal services on Chinese soil, restriction of customs rates to 5 per cent, maintenance of bodies of foreign troops in China and of war vessels in Chinese waters, establishment of autonomous communities of foreigners in certain cities, control over banks and railways, etc. While the war had cancelled these privileges in the case of Germany and Austria, and Russia had renounced them, other powers were slow to surrender them. Belgium protested the unilateral abrogation of the Treaty of 1865 and referred the controversy to the Permanent Court of International Justice, but early in 1927 withdrew the case and began negotiations with Peking for a new treaty.

While these events were taking place, the interminable struggle for control continued with little pause. In the South, a Yunnanese army occupied Canton and on June 6, 1925, its leader, General Yang Hsi-min, opened hostilities on the Kuo Min-tang. By June 12, however, the latter was completely victorious, driving the Yunnanese with great slaughter from the city. In the North, the career of Chang Tso-lin, lord of Manchuria, came near being ended when a rebellion by General Kuo Sung-lin failed of success, as reported, only through the timely extension of aid to Chang by the Japanese. As it was, Kuo Sung-lin was defeated and executed, with his wife, in December, 1925. In December also, Feng Yu-hsiang attacked and defeated General Li Ching-lin, governor of Chihli, and captured Tientsin from him. Li was allied with Chang Tso-lin, who sent him munitions but too late.

It appeared to be only a question of time before the two victorious generals, Feng and Chang, would battle for supremacy, particularly as the former was now definitely allied with the Southern Nationalists. The clash came on Jan. 19, 1926, and resulted in a defeat for the Manchurian general. General Wu Pei-fu, however, came to his assistance and with the help of General Li Ching-lin, who brought an army from Shantung, the new allies forced Feng first out of Tientsin to Peking, and then out of the capital to Kalgan. Here the Kuominchun, or

Nationalist army, remained until August 16, when it retired in good order into Mongolia. In March, these hostilities almost precipitated an international crisis, when the Kuominchun fortified the Taku forts at the mouth of the Pei River, which leads to Tientsin and Peking, and stopped all river traffic. The United States, Great Britain, France, Italy, and Japan joined in a protest that this action violated the Boxer protocol of 1901 by which free communication between Peking and the sea was to be maintained. The protest was effective and the river was cleared. President Tuan Chi-jui's position, however, was still further weakened by the incident and when his supporter, Feng Yu-hsiang, was driven from Peking, he was deposed.

The varying fortunes of the warring factions in the North were soon rendered of secondary significance by the military developments of the South. While the antagonism of the Right and Left groups in the Kuo Min-tang grew sharper (following the death of Sun Yat-sen), it did not for the time being prevent unity of action in military affairs. In May, 1926, the Southern Nationalists were materially strengthened by the addition of the army of Tang Sheng-chi, who deserted Wu Pei-fu. With this aid, Chiang Kai-shek, commander-in-chief of the Cantonese forces, was able to advance rapidly northward. In July, the combined armies recaptured Changsha, in Hunan Province, which a short time before had been lost to Wu's troops, and proceeded northward toward Hankow. The rapid progress of the Southern forces brought Wu hurriedly from the North to take personal charge of the defense; but his army crumbled away before the advancing Nationalists, who, in September, reached Hankow, on the Yangtze River. That important centre, together with the neighboring city of Hanyang, were surrendered to the Nationalist armies on Sept. 7, but nearby Wuchang resisted the besiegers until October 10. Meanwhile, Chiang Kai-shek continued his triumphant advance. Wu Pei-fu's army melted away before him and the general himself was forced to retire to Chengchow. A more formidable army now appeared to check the onrush of the Southern troops. This was the force of General Sun Chuan-fang, military governor of Kiangsu Province and of Shanghai. On March 30, he had proclaimed the independence, under his control, of the five provinces of central China—Kiangsu, Chekiang, Anhwei, Kiangsi, and Fukien. As between the North and the South, he had remained neutral until the successes of Chiang Kai-shek brought the Nationalist to the borders of his territory. Then he made common cause with Wu Pei-fu and Chang Tso-lin. His army engaged that of Chiang in September and October with varying success.

The Nationalists had a most powerful ally in the sympathy of Chinese generally with their central idea of "China for the Chinese." Operating behind the lines of the enemy, it tended to disintegrate the opposition and detach great numbers of enemy troops. Wholesale desertions wiped out the greater part of Sun Chuan-fang's army, and when two columns of troops were directed against Chiang Kai-shek from the North, both encountered such opposition that they failed to reach their destination. By the close of 1926, Chiang held control of most of the territory south of the Yangtze, including the greater part of the provinces of Kiangsi, Fukien, and Chekiang, and was threatening

Shanghai. After the capture of Hankow, the seat of the Nationalist government was moved to that city from Canton.

The dramatic and spectacular success of the Nationalist armies brought swift repercussions in the foreign offices of the Powers, among the populace of China, and in the ranks of the Kuo Min-tang itself. Great Britain on Dec. 25, 1926, made public a memorandum handed by the British chargé d'affaires in Peking to the representatives of the "Treaty Powers" in which a new "constructive policy" was suggested, including practical recognition of the government of the South, immediate consent to the imposition of the "Washington surtaxes" on all imports into the country, a liberal attitude with regard to extraterritoriality and the abandonment of the foreign control over the "concessions," etc. It proposed, however, that the Powers should act in concert, and this suggestion, together with orders for further large troop movements to China, added to the suspicion in China that the real object of Great Britain was to form a united diplomatic front in opposition to the rising tide of nationalism. On the other hand, the memorandum was received with marked dissent in both France and Japan because its liberal concessions, in the words of the semi-official Paris *Matin*, were "flagrantly inopportune." On December 28, the French cabinet refused to accept the suggested collaboration.

The attitude of Japan, which was particularly concerned about the tariff increases, was much the same as that of France. Failing to obtain united action by the Powers, Great Britain accepted the Nationalist suggestion of separate negotiations and submitted an offer of liberal concessions; but the Nationalist Foreign Minister, Eugene Chen, refused to continue negotiations because of the British show of military force. On Jan. 26, 1927, Secretary Kellogg issued a statement defining the position of the United States in which he asserted that the United States Government desired to deal with China "in a most liberal spirit" and expressed a readiness to continue negotiations on extraterritoriality and customs in company with the other Powers, or to take up negotiations on behalf of the United States alone, as soon as China could agree on delegates representing the people or the authorities of the whole country.

All the Powers maintained their right to protect their own nationals in the disturbed areas. The need for such protection at this time was particularly pressing. Throughout China the successes of the Nationalists had raised a storm of anti-Christian and anti-foreign agitation, attended frequently by threatening demonstrations and actual mob violence. European and American refugees came in increasing numbers from the interior to the coast cities where they could rest under the protection of foreign warships and troops. Religious bodies took steps to remove their missionaries from the more isolated stations.

So full of menace did the situation become that the American Minister, on Jan. 13, 1927, advised American citizens throughout the interior and the South to seek protection in the coast cities. The United States dispatched further naval vessels and marines to the Far East and other Powers took similar action, Great Britain ordering 20,000 additional troops to Shanghai. Early in January, the British concessions in Hankow and Kiukiang were overrun

by mobs. On March 24, when the Nationalists entered Nanking, a systematic attack was made on foreigners there. Seven persons were killed, including one American, the American and Japanese consulates were entered and damaged, and the British, Japanese, and American consuls were fired upon. British and American citizens, including the American consul, took refuge in buildings of the Standard Oil Co., and when they were fired upon there, gunboats of the United States and Great Britain lying nearby on the river shelled the city for a short time until the persons under attack could be removed to the vessels. Although there was little loss of life, the Nanking incident greatly intensified the hostile feeling toward foreigners throughout the country and on the other hand brought sharp communications from England and America to the Nationalist government and the lodging of claims which were eventually fully satisfied.

In the meantime, the Nationalist military forces were continuing their triumphant advance with Shanghai as their immediate objective. In January, they occupied the province of Anhwei and on February 17 captured Hangchow. Continuous Nationalistic propaganda in enemy territory, threats of strikes by workers in cities they approached, and the defection to their cause of one military leader after another as they advanced greatly helped their forward progress. Their Northern commander, Feng Yu-hsiang, likewise threatened with an army of 50,000 the rear of the opposing armies, which now comprised the forces of Chang Tso-lin, Chang Tsung-chang, Governor of Shantung, and Sun Chuan-fang, late governor of the "five provinces."

Shanghai was finally occupied on March 21, when the general in command came over to the Nationalists. Two days later, Nanking was captured and Chiang Kai-shek began preparations for the final drive on Peking. By this time, the antagonism of the moderates and the communists within the Kuo Min-tang organization had deepened to the point of an open rupture. Chiang Kai-shek, as leader of the moderates, definitely broke with the communists and set up his own government at Nanking in opposition to the Hankow government of the extremists. The move aligned the army of Tang Seng-chi with his foes, but Chiang nevertheless continued his advance northward. In addition to Feng Yu-hsiang, he now had as allies Wu Pei-fu and the "model governor" of Shansi Province, Yen Hsi-shan, who cast in his lot with the Southern cause.

By May 30, Chiang's army had taken Pengpu and Suchow and was threatening an advance into Shantung. Early in June, the Northern forces retreated across the Yellow River. With the Northern cause apparently desperate, rumors of peace negotiations and an alliance between Chang Tso-lin and Chiang Kai-shek on the basis of Sun Yat-sen's principles were heard but were sharply denied by the latter. In the middle of June, Chang Tso-lin was constituted dictator of the Northern forces and the Peking government. Toward the close of June, Feng Yu-hsiang and Chiang Kai-shek met in Suchow to plan a concerted advance on Peking; but in July, the defense of Shantung suddenly stiffened. The Northern army concentrated on an attack on Suchow and, after prolonged and bitter fighting, recaptured the city. It marked the turn of the tide. Chiang Kai-shek, driven back from one position after another, resigned his command



on August 15, because of his reverses and in order to preserve harmony in his party, and later retired to Japan.

Under General Sun Chuan-fang, the Northern army now advanced until it threatened Nanking and Shanghai; but their desperate situation rallied the Nationalists and they first stopped the enemy advance and then gradually pushed the Northern army back until by the middle of December they were again in possession of Suchow. Once more successful, the Nationalist leaders insisted on the return of Chiang Kai-shek to the command of their forces and he consented, but stipulated that he was to retire when the military victory should be complete. On both sides, the early months of 1928 were spent in preparations for a renewal of the conflict. In April, the Northern general, Sun Chuan-fang, attacked Feng Yu-hsiang, but the latter's army counter-attacked and in conjunction with the forces of Chiang Kai-shek inflicted a severe defeat on the Northerners. On May 1, Chiang Kai-shek captured Tsinan, capital of Shantung Province; but the victory immediately brought a clash with the Japanese, who had moved considerable forces to Shantung, and on their orders he was forced, under protest to the Japanese Government and to the League of Nations, to evacuate the city. He then turned toward Peking, but events made it unnecessary for him to advance on the capital. Faced by converging Nationalist armies, Chang Tso-lin did not await the attack but on June 3 (it is believed on the advice of the Japanese) left the city with his cabinet for Manchuria. When his train neared Mukden, it was bombed and he died shortly afterward from his injuries. There was strong evidence that the Japanese were concerned in the plot. On June 5, General Yen Hsi-shan, Governor of Shansi, occupied Peking with his Nationalist army, and the full triumph of the Nationalist cause was assured. The death of Chang Tso-lin removed the last great obstacle to the consolidation of the country under the Kuo Min-tang. Although there was some further scattered fighting, the opposing armies soon melted away. Chang Tso-lin's son and successor, Chang Hsueh-liang, received the representatives of the new régime cordially and readily acknowledged the authority of their government over the whole of China. On the insistence of the Japanese, he delayed announcing his adherence for several months, but, on December 29, he raised the flag of the new government over his palace instead of the old flag of the Republic.

With the military victory completed, the Nationalist leaders turned at once to the task of reconstruction. Peking was abandoned as a capital and renamed Peiping, and the seat of the new government was placed at Nanking. Without waiting for the formal organization of a new constitutional government, the United States, on July 25, signed a treaty with China recognizing the Nationalist régime and its complete tariff autonomy, the Senate ratifying the treaty on Feb. 11, 1929. Before the close of the year, twelve nations in all had taken action of this kind with respect to the tariff, stipulating only that no nation should enjoy greater tariff benefits than the signatories of the treaties. They included the United States, Germany, Norway, Belgium, Italy, Denmark, Portugal, the Netherlands, Great Britain, Sweden, France, and Spain. Five of these—Italy, Belgium, Spain, Denmark, and Portugal—had

also pledged themselves to abandon extra-territoriality by Jan. 1, 1930.

On October 3, the basis for a new government was laid by the promulgation of a new constitution (which, however, was declared to be provisional in character) creating five branches of government, executive, legislative, judicial, examination (for testing candidates for public position), and control (for exercising powers of impeachment and auditing). The President and Vice President were provided for as heads of the executive branch and presumably of the nation itself. On October 9, the Executive Committee of the Kuo Min-tang elected Chiang Kai-shek President, and he announced a cabinet which included the following: Minister of Foreign Affairs, C. T. Wang; Finance, T. V. Soong; War, Feng Yu-hsiang; Agriculture, Yu Pei-chi; Industry, H. H. Kung; Education, Chiang Meng-ling; Railways, Sun Fo; Interior, Yen Hsi-shan; Communications, Wang Po-chun; and Health, Hsueh Tu-pi.

These officials applied themselves at once to the task of making China a unified state which could take its place as an equal in the family of nations. Among the first moves in that direction was the promulgation on Dec. 10, 1928, of a new schedule of import tariffs to go into effect Feb. 1, 1929. They covered practically all articles of import and were drawn up to provide revenue rather than protection, with a moderate range of 7½ to 59 per cent. Japan alone held out against any new rates until her old treaty with China should be abrogated by mutual consent, but finally accepted them on the day before they became effective. Foreign administration of the customs machinery was not affected by tariff autonomy. In January, 1929, an attempt was made to form a practicable plan for cutting down the country's military forces by nearly a million men. The major policies of the Government were directed toward centralizing administration of the country in the capital, particularly with respect to financial and military matters. The first formidable challenge to its authority came in the shape of a revolt by General Chang Tsung-chang, former Governor of Shantung. It centred around Chefoo. Hostilities began on February 21 and for a while the rebel forces made some headway; but in May they were defeated by the government general, Liu Chen-nien, and Chang Tsung-chang fled to Japan. Another revolt in Hankow was quickly put down. More dangerous than these actual outbreaks was the disaffection of Feng Yu-hsiang, who resigned his post as Minister of War in the spring of 1929. Antagonism between Feng and his following and the official government led by Chiang Kai-shek grew greater until, in May, it was reported that Feng was on the verge of beginning war on the Nanking government. By a resolution of the Central Executive Committee of the Kuo Min-tang on May 23, Feng was dismissed from all official connection with the Government and a punitive mandate against him was authorized. The situation did not reach the stage of open warfare, however, and in midsummer it was reported in the press that he was being sent abroad by the Government on an extended mission of study. Disorders occurred in Canton in May, when Kwantung forces were obliged to defend that city against an attack by a Kwangsi faction. On May 30 occurred the final act in the history of Japanese occupation of Shantung,

when the last of the Japanese troops departed from the province. On June 1, an elaborate state funeral was held at Nanking for Dr. Sun Yat-sen, whose body had been brought down from near Peiping. Throughout the first half of 1929, a very severe famine prevailed in central China affecting tens of millions of Chinese. See *RUSSIA*, under *History*.

**CHINA, ANCIENT CIVILIZATION OF.** See *ETHNOLOGY*.

**CHINARD, shîn'ar', GILBERT (1881- )**. A French philologist who was born in Châtellerauld and studied at Poitiers and the Sorbonne. He was instructor of French at the College of the City of New York in 1908, then for four years at Brown University, and from 1912-19, professor at the University of California. After 1919, he was at Johns Hopkins, where he was joint editor of the *Johns Hopkins Studies in Romance Literature and Languages*, and professor of French literature after 1925. His publications include: *L'exotisme américain dans la littérature française, au XVIème siècle* (1911); *L'Amérique et le rêve exotique* (1913); *L'exotisme américain dans l'œuvre de Chateaubriand* (1918); *Chateaubriand, Les Natchez* (1919); *La doctrine de l'Américanisme* (1919); *Volney et l'Amérique* (1923); *Jefferson et les Idéologues* (1925); *Les réfugiés huguenots en Amérique* (1925); *The Common Place Book of Thomas Jefferson* (1926); *Destruction of Tracy, de l'Amour* (1926); and *Les amitiés françaises de Jefferson* (1927).

**CHIROL, chîr'ol, SIR VALENTINE (1852- )**. An English journalist and writer on the Orient (see *VOL. V*). His later works include: *Cecil Spring-Rice: In Memoriam* (1919); *The Egyptian Problem* (1920); *India, Old and New* (1921); *The Occident and the Orient* (1924); *India (Modern Nations Series, 1926)*; and his reminiscences, *Fifty Years of a Changing World* (1927).

**CHIROPRACTIC.** A system of preventing and healing disease by manipulation which followed the success of osteopathy but which its practitioners assert to be of independent origin and derived by its originator, D. D. Palmer, from discoveries made accidentally during so-called magnetic healing. At first, a practitioner of the latter and conductor of a school of magnetic healing, D. D. Palmer, then of Davenport, Iowa, changed his methods to what he designated as a chiropractic. He soon established his cult in Oklahoma, where he opened a college. This period, from the accidental discovery until the establishment of the school, covered the decade 1895-1905. Palmer later removed to California and continued his practice there until his death at San Diego in 1913. Disputes arose as to the legitimate successor of Palmer and also as to the essential features of chiropractic. B. J. Palmer, son of the founder, opened a school of Chiropractic at Davenport which turned out thousands of graduates practicing the so-called Palmer method.

It has been admitted by the legitimate chiropractors that many bogus graduates and unqualified practitioners often usurped the name and functions of chiropractic, and they asserted that universal legalization of the practice would be necessary to eliminate this fraudulent element. Owing to the highly technical character of the manipulations of chiropractic, as well as the different conceptions of the art by its own practitioners, no attempt will be made to describe them here.

Since the introduction of this cult, about 150 schools have been started for qualifying practitioners of chiropractic, but many have closed—no less than 48 in the past few years—and the number functioning in 1928 was said to be only 40 of very unequal facilities for instruction. No less than six exist in California, where the cult flourishes. The best known are the original Palmer School at Davenport, Iowa, with between 200 and 300 annual graduates, the National College of Chiropractic in Chicago, and the Los Angeles College of Chiropractic with an output of about 100 graduates.

At a meeting of chiropractors in Pittsburgh, Feb. 26, 1928, B. J. Palmer complained that 80 per cent of the chiropractors in Pennsylvania were practicing medicine, and that this defection meant the downfall of the cult as such. During the preceding 18 months the supreme courts of seven States had handed down legal injunctions whereby the cause of chiropractic was permanently lost. Bills for legalizing the cult have been lost in the legislatures of New York, Massachusetts, Pennsylvania, and the District of Columbia, while licensing boards have been recognized in Kentucky and Indiana.

**CHITTENDEN, RUSSELL HENRY (1856- )**. An American physiological chemist (see *VOL. V*). During the World War, Chittenden was a member of the Advisory Committee on Food Utilization and also a member of the executive committee of the National Research Council. He edited the *United States Report of the Inter-Allied Scientific Commission* (1918). In 1922 he was made emeritus professor of physiological chemistry at the Sheffield Scientific School, Yale University.

**CHLOROPHYLL.** See *BOTANY*.

**CHODAT, shôd'â, ROBERT (1865- )**. A Swiss botanist (see *VOL. V*), director of the Botanic Institute, The Alpine Garden "La Linnaea," and the laboratory of Alpine biology at Bourg-St.-Pierre. In 1914 he was made a member of the Linnean Society and in 1918 director of l'Herbier Boissier. His later works include: *Végétation du Paraguay* (1916-1921); *Biologie des Plantes* (1917); another volume of *Principes de botanique* (1920); and *Scenedes mus, monographie* (1926).

**CHOLECYSTOGRAPHY.** See *GALL-STONE DISEASE*.

**CHÖSEN.** See *KOREA*.

**CHRISTEN, krës'ten, JOSEFINE (1869- )**. An Austrian sculptor and feminist, born in Bohemia of Czech and French parentage. She studied music and for 13 years was on the operatic stage under the direction of the famous manager, Angelo Neumann. Then she studied art in Prague and later in Paris, and in 1908 settled in Vienna. From 1915 to 1917, she was with the Austrian Army as official sculptor, and in 1918 exhibited her war work. Becoming absorbed in political life, she founded and was president of the Austrian Women Voters' Association. Her principal works are "Cain," "Salome" and "The Consoling Muse." She did many private monuments and exhibited portraits in Paris, Vienna, Turin, etc. Her musical compositions included a mass, some orchestral works, and songs with piano accompaniment.

**CHRISTIAN X, CARL FREDERIK ALBERT ALEXANDER VILHELM (1870- )**. King of Denmark and Iceland (see *VOL. V*). By his personal popularity and tact, he was able during the World War to keep Denmark strictly neu-

tral. In 1915 he approved a new constitution which limited the monarchy, in 1917 Denmark sold the Danish West Indies to the United States, in 1918 Iceland was given greater states rights, and in 1920 Denmark entered the League of Nations. The great event of his reign, however, was the plebiscite which brought back North Schleswig to Denmark. During his reign more than 2500 square miles of useless land were reclaimed to agriculture; a merchant marine was developed; world-wide commercial enterprise launched; and a number of important scientific discoveries were made. See DENMARK, under *History*.

**CHRISTIAN CHURCH.** This denomination changed the name of its administrative body from the American Christian Convention to the General Convention of the Christian Church in 1922. There were, in 1916, 1213 ministers; 1265 churches, including 111 colored; 118,737 members, including 10,120 colored; and 1115 Sunday schools, with 91,853 members. These compared with the following statistics reported to the denomination in 1928: 1113 ordained ministers, including 216 colored; 308 unordained, including 121 colored; 1202 churches, including 173 colored; 118,206 members, including 14,107 colored; 917 Sunday schools with 93,108 members; and 372 Christian Endeavor societies with 8264 members.

The foreign mission work, which has been carried on for some years in Japan and Porto Rico, was extended to South America in 1926. Home missionaries are active in the Western lumber camps and among the Indians, and with Negroes and mountaineers. The Christian Publishing Association, at Dayton, Ohio, in addition to other periodicals, issues one of the oldest religious newspapers in the United States, *The Herald of Gospel Liberty*, a weekly founded in 1808. The denomination maintains eight educational institutions, a home for aged ministers, and an orphanage.

On Mar. 3, 1924, the Commission on Christian Unity of the Church addressed an overture to a number of churches looking toward a corporate unity. As a result of this action, the National Council of the Congregational Church and the General Convention of the Christian Church voted a merger of the two denominations, to be known as the General Council of the Congregational and Christian Churches, which came officially before the two bodies in 1929. The enterprises of the two denominations are being combined as rapidly as the necessary legal adjustments can be effected.

**CHRISTIAN ENDEAVOR, INTERNATIONAL SOCIETY OF.** Founded in 1881 as the United Society of Christian Endeavor, the name was changed in August, 1927. It is an interdenominational society designed to train young people for church membership and church work. Departments of Christian vocations, and of travel and recreation were added in 1927 to the four groups, junior, intermediate, and senior societies, and alumni council, into which the activities of the organization were previously divided. The number of societies throughout the world increased from 75,000 in 1914 to approximately 80,000 with 4,000,000 members by 1929. In the latter year, the International Society included branches in over seventy countries besides the United States and Canada. The Comrades of the Quiet Hour, who devoted themselves to a definite period of prayer and meditation each

day, increased in membership from 168,779 in 1918 to 252,622 in 1927; and the Tenth Legion, whose members gave one-tenth of their incomes to religious work, increased its membership from 51,302 to 73,859. A biennial convention of the Society was held at Kansas City, Mo., July 3-8, 1929. The headquarters of the society are at Mount Vernon and Joy Streets, Boston, Mass.

**CHRISTIANIA.** See OSLO.

**CHRISTIAN SCIENCE.** During the years 1915-28, the Christian Science denomination continued and increased its previous progress. In the first thirty-five years of the Christian Science movement (1879-1914), the number of organized congregations (churches and societies) grew from one to 1488. During the fourteen years from the beginning of 1915 to the end of 1928, this number increased from 1488 to 2382. Of the last mentioned number, 1997 were in the United States, 185 were in Great Britain and Ireland, 61 were in Canada, 38 in Germany, 17 in South Africa, 14 in Australia, 12 in Switzerland, 9 in New Zealand, 4 in France, 4 in Holland, 3 in Sweden, and 38 in other countries. At the end of 1928, there were 9589 Christian Science practitioners accredited as such by the Christian Science Mother Church, the First Church of Christ, Scientist, in Boston, Mass. At the same time, the number of Christian Science teachers authorized by The Mother Church was 306.

One of the most notable developments during the period under review is the growth of Christian Science Sunday Schools. In the early history of this denomination, children attended Sunday services with their parents. Afterwards, only the larger churches had Sunday Schools. In recent years, however, each church and society has conducted a Sunday School for pupils up to the age of twenty years. Now, it is not unusual for the number of children in a Sunday School to equal or exceed the number of adult members in the church or society, and more than a few of the pupils in these schools have parents who are not interested in Christian Science for themselves.

Another notable development during the period 1915-18 has been the increased appreciation and respect for Christian Science shown by the public. Criticism and misapprehension of this religion have diminished, attendance at its church services and lectures has increased steadily. So has the demand for Christian Science literature (the writings of Mary Baker Eddy and the periodicals issued by The Christian Science Publishing Society); so has the inquiry for Christian Science healing and the acknowledged results thereof. Acquaintance with Christian Science and interest in this subject have been greatly extended by the radio broadcasting of church services and lectures, which is now done extensively and regularly.

Notable, also, have been the recognitions given to Christian Science by national and state governments. For instance, there have been chaplains in the United States Army and Navy, and numerous acts of legislative bodies have implied that Christian Science treatment has acquired a permanent place among remedial practices. Thus, the United States Congress, when legislating for the District of Columbia, and the legislatures in most of the United States have applied religious freedom to the practice of Christian Science, either explicitly or in general terms. The same can be said for several of the

Canadian Provinces; and in England, where Christian Science is not so well known, the British Parliament, when passing the Nursing Homes Registration Act, 1927, exempted Christian Science houses from medical requirements.

During the period 1915-28, the Christian Scientists developed and extended their unique agency, the Christian Science reading room. Each Church of Christ, Scientist, provides, at a place convenient for the public, at least one reading room where anybody who desires to do so may read or study the Bible with the books and periodicals which constitute the authorized literature of Christian Science, or may enjoy an interval of meditation and rest. In the larger cities, each of the local churches has a reading room in its own vicinity, while all of them unite in maintaining one or more reading rooms in central locations; and the quiet welcome to be found at these rooms is accepted by a large and increasing number of people who may or may not be affiliated with Christian Science.

During the years 1915-28, the growth and permanency of the Christian Science denomination has been evidenced remarkably by the increased number of church edifices. Almost without exception, the meetings of this denomination in Boston and elsewhere began in rented halls. Now, many or most of the branch churches have followed the example of The Mother Church in erecting and owning their own buildings. Always designed to be of churchly type, many of these edifices are notable for beauty as well as adaptation to Christian Science services.

In 1920 The Christian Science Benevolent Association opened a large sanatorium in Brookline, Mass., which was under the auspices of The Mother Church. As enlarged since then, it furnishes accommodations for 148 guests, who may go there either for care while in quest of Christian Science healing or for recuperation and rest. A site for a similar institution has been acquired at San Francisco which is also to be under the auspices of The Mother Church. At many other places, homes for the care of patients under Christian Science treatment are conducted by Christian Scientists as personal undertakings, the practice of Christian Science healing being always regarded as an individual ministry.

Another institution opened in 1927 under the auspices of The Mother Church is The Christian Science Pleasant View Home. This is a home for elderly Christian Scientists on the site near Concord, N. H., where Mrs. Mary Baker Eddy resided from 1892 to 1908. As now constructed, the main building has accommodations for 150 residents and employees, and is surrounded by grounds comprising about 100 acres. An auditorium seating 150 is used for Christian Science services; the dining-room, large enough for 200 persons, anticipates additional buildings or extensions. Admission to the home depends on length of service and creditable work for Christian Science.

In recent years, the Christian Science Mother Church has encountered persistent opposition from former members still claiming to be Christian Scientists. Controversy and litigation have resulted, but the attitude of The Mother Church has been consistently defensive, and neither its position nor its progress appears to have been impaired.

**CHRISTIANS.** See **CHRISTIAN CHURCH.**

**CHRISTIE, GEORGE IRVING** (1881- ). An American educator, born at Winchester, Ont.,

Canada. He graduated from Iowa Agricultural College in 1903 and since 1905 has been connected with the agricultural department of Purdue University as superintendent of agricultural extension, director of the Agricultural Experiment Station, and director of the Summer School for Teachers. He was State Food Director for Indiana, 1917-19, and assistant Secretary of Agriculture, 1918-19. He was also a member of several important boards relating to agriculture during the World War. Since 1919 he has been superintendent of the International Grain and Hay Show.

**CHRISTY, HOWARD CHANDLER** (1873- ). An American painter (see VOL. V). He returned to portrait painting in 1920 and painted portraits of Will. H. Hays, George Harvey, Post Wheeler, and others. He also painted portraits of the late President Warren G. Harding, former President and Mrs. Coolidge, Charles E. Hughes, Premier Mussolini, Crown Prince Humbert of Italy, and many others.

**CHROMOSOMES.** See **ZOOLOGY.**

**CHUBB, PERCIVAL** (1860- ). An American educator (see VOL. V). He was president of the Drama League of America from 1915 to 1917 and from 1918 to 1920.

**CHURCH OF ENGLAND.** See **ENGLAND, CHURCH OF.**

**CHURCH OF GOD.** See **ADVENTISTS.**

**CHURCH OF THE NEW JERUSALEM.** See **NEW JERUSALEM, CHURCH OF THE.**

**CHURCH UNITY.** See **RELIGIOUS CONTROVERSIES**, and articles on different denominations.

**CHURCHES OF CHRIST.** See **DISCIPLES OF CHRIST.**

**CHURCHES OF CHRIST IN AMERICA, FEDERAL COUNCIL OF THE.** See **FEDERAL COUNCIL OF THE CHURCHES OF CHRIST IN AMERICA.**

**CHURCHILL, CHARLES SAMUEL** (1856- ). An American railway official, born in New Britain, Conn. He graduated from the Sheffield Scientific School in 1878 and, from 1879 to 1881, was engaged in surveys and railroad construction in Connecticut and Pennsylvania. He served as superintendent of construction and as engineer of many important railroads in the Middle West and, from 1918 to 1926, was vice president of the Norfolk & Western Railroad. He was chairman of commissions representing the Southern group of railways on Federal valuation, in 1913. An authority on the ventilation of railway tunnels and on the testing of materials, he was a frequent contributor of technical articles to engineering publications and a member of several scientific and engineering societies.

**CHURCHILL, WINSTON** (1871- ). An American author (see VOL. V). His most recent works include: *A Far Country* (1915); *The Dwelling Place of Light* (1917); *A Traveller in War-Time, with an Essay on the American Contribution to the Democratic Idea* (1918); *Dr. Jonathan*, three-act play, (1919); and *The Orisis* (1921).

**CHURCHILL, THE RT. HON. WINSTON LEONARD SPENCER** (1874- ). An English statesman (see VOL. V). At the outbreak of the World War, he was First Lord of the Admiralty but was forced to resign in 1915, and was then appointed Chancellor of the Duchy of Lancaster. After brief service in the army, he was made Minister of Munitions, 1917-18. He was blamed for the Dardanelles disaster of 1917, but never

theless served as Secretary of State for War and for Air (1918-21). He was Secretary of State for the Colonies (1921-22). From 1924 to the advent of the Labor Government in June, 1929, he was Chancellor of the Exchequer in the Conservative ministry, having turned from the Liberal Party in order to oppose socialism. In 1925, under his administration, Great Britain returned to the gold standard. He wrote: *The World Crisis* (4 vols., 1923-27), of which a large part is a defense of his policies as First Lord of the Admiralty, and *The World Crisis: The Aftermath* (2 vols., 1928, 1929).

**CILICIA.** This region in southeastern Asia Minor was the centre, after the World War, of Armenian nationalistic aspirations and later of French imperialistic schemes. It was occupied by the British-French forces in their triumphant march north in 1918; its control fell to the French in 1919 in accordance with the terms of the secret Sykes-Picot agreement of May, 1916. The later discredited Sèvres Treaty of 1920 put the stamp of approval on the occupation by assigning a portion of Cilicia to the French mandate territory of Syria. A secret treaty, signed at the same time by France, Great Britain, and Italy, protected France in her rights in the rest of the territory by means of a zone of influence. Armenians flocked there in the hope of gaining asylum, as well as possible French support in operations against the Turkish Nationalists who late in 1920 were moving against their compatriots in the East. The French policy had veered about, however. Rather than manifest an interest in Armenians, the French bent all their energies to conciliating the Turks. The Turks, strangely enough, were unyielding, and French attempts at the pacification of Cilicia were stubbornly resisted in 1920-21. The policy proved wasteful and ill-advised, and from March, 1921, the French tried to withdraw as gracefully as they might. Finally, on Oct. 20, 1921, France and the Angora government signed a treaty which provided for the evacuation of Cilicia. (See **TURKEY**.) A subsequent agreement provided for the protection of the Christian populations, the postponement of military conscriptions, and the creation of a Franco-Turkish commission with Cilician representation for the safeguarding of property. By Great Britain, the step was regarded with hostility, for it meant a further repudiation of the Entente as well as the endangering of British interests in the Near East. The boundary between Syria and Turkey, as fixed by the Treaty of Oct. 20, 1921, was written into the Treaty of Lausanne of July 24, 1923. Cilicia thus once more reverted to Turkey.

**CINCINNATI**, sîn'sîn-nā'tī. The second city of Ohio, ranking eighteenth among cities of the United States. The population increased from 384,745 in 1910 to 401,247 in 1920, and to 413,700 in 1928, by estimate of the Bureau of the Census. Approximately 90 per cent of the population is American born. A home-rule charter was adopted in 1918 by popular vote, and in 1926 the city-manager form of government was accepted, with proportional representation for the nine members of the Council. The City Manager is selected by the Council and receives a salary of \$25,000 a year. One of the Council members, chosen by that body, acts as Mayor.

A rapid transit system is under construction, a portion of it utilizing the right of way of the abandoned Miami and Erie Canal, which was

turned over by the State for the purpose. The completed work will include 2.45 miles of subway, 9 miles of open trackage, 0.2 miles of tunnel, 3.4 miles of concrete trestle and 1.4 miles of concrete elevated structure. The exhaustion of \$6,000,000 provided by a bond issue in 1916 led to a halt in construction in 1928. On Jan. 1, 1929, by charter amendment, the duties of the Rapid Transit Commission passed to the City Manager. Further plans are to be developed. The street railway is privately owned, being operated on a service-at-cost system. A double-deck terminal for interurban electric cars was finished in 1923 at a total cost of approximately \$11,000,000. The Southern Railway, extending 336 miles from Cincinnati to Chattanooga and valued at approximately \$48,000,000 by the Interstate Commerce Commission, is the only railroad in the United States which is municipally owned.

To accommodate nine railroads, radiating from Cincinnati to all sections of the United States, a Union Depot and Freight Terminal to cost \$75,000,000 is being erected. Cincinnati is also a leading airport. Lunken Field, in the eastern part of the city, consists of 953 acres with a 3800-foot runway, while Watson Field, at Blue Ash, consists of 100 acres. The improvement of the Ohio River, with a view to establishing a 9-ft. stage the year round, was completed in 1924 and has proved of special benefit to Cincinnati in the shipment of coal from the Kentucky, Tennessee, and West Virginia fields.

The average number of wage earners in metropolitan Cincinnati's 2094 manufacturing establishments in 1925 was 90,659. The output of these establishments was valued at \$678,700,219. The Bureau of Business Research of Ohio State University estimated the total wage and salary payments for 1926 at \$235,279,000, the second largest in the State. From 1920 to 1926, there was an increase of 24.4 per cent in industrial payrolls and during the same period an increase in manufacturing total wage and salary payments of 6.56 per cent.

The assessed valuation of real and personal property in Cincinnati is \$1,107,000,000, the tax rate for 1928 being \$21.60 per \$1000. In December, 1928, the general bonded debt amounted to \$99,322,580. In 1928 the total value of building permits issued was \$42,661,323, an increase of approximately 13 per cent over the previous year. Cincinnati has 626.33 miles of paved streets and 625 miles of sewers. Recent public improvements include the Central Parkway, which cost \$4,250,000, and the Chamber of Commerce Building, which cost \$2,000,000. Among the bonds approved by vote of the people in 1928 were: \$1,000,000 for the Western Hills Viaduct to be built by the city and the Union Terminal Company, the latter to pay approximately \$2,500,000 and the city \$1,000,000; \$1,000,000 for the widening of Plum Street from the Central Parkway to Second Street, so as to expedite traffic in the central district; \$2,000,000 for the elimination of some 10 important grade crossings; \$300,000 for an outdoor dispensary at the General Hospital; \$500,000 for playfields; and \$100,000 for additional parks.

Cincinnati has 23 banks with a capital of \$26,125,000. Surplus and undivided profits amount to \$31,942,871; loans, \$208,586,710; deposits, \$357,390,010; total resources, \$448,962,024. The per-capita wealth is approximately 4,500,



The churches number 403, with the following in the lead: Roman Catholic, 71; Baptist, 66; Presbyterian, 42; Methodist Episcopal, 41; Protestant Episcopal, 20; Jewish, 18. The extensive public-library system includes one main library and several branches in schools and other agencies, with a yearly circulation of 2,345,919 books. There are 14 other special libraries. The public schools number 65, with an enrollment of 69,753 and the parochial schools, 208 with an enrollment of 45,625. See CINCINNATI, UNIVERSITY OF.

**CINCINNATI, UNIVERSITY OF.** A coeducational municipal institution at Cincinnati, Ohio, founded in 1871. From 1914 to 1928, the student body increased from 1866 to 9001, and 1310 attended the summer session of 1928; the faculty increased from 186 to 571 members; the library, from 96,000 bound volumes and 79,000 pamphlets to 144,648 volumes; the productive funds, from \$1,500,000 to \$6,239,545; and the income, from \$290,000 to \$1,820,821. The College of Commerce was merged with the College of Engineering, which was known thereafter as the College of Engineering and Commerce; the Cincinnati Hospital Training School for Nurses became a department in the College of Medicine in 1916; the Cincinnati Law School became the College of Law of the University in 1918; the School of Household Arts, organized in 1914, was made the department of home economics in the College of Education; a new department of hygiene and physical education was organized in 1916; and a department of leather research and a professorship of surgical anatomy were created in 1921. In 1922 the School of Applied Arts was opened under the direction of the dean of the College of Engineering and Commerce. A chemistry building and a women's building were completed in 1916 and a dormitory for men in 1923; the Alphonso Taft College of Law Building was opened in 1925 and in that year the Tanners' Council of America built a research laboratory in connection with the College of Engineering and Commerce. In 1929 Dean Herman Schneider, Sc.D., was elected president succeeding Frederick Charles Hicks, Ph.D.

**CINCINNATI SYMPHONY ORCHESTRA.** See MUSIC, under *Orchestras*.

**CINEMA.** See MOVING PICTURES.

**CINEPHOTOGRAPHY.** See PHOTOGRAPHY.

**CITIES.** See MUNICIPAL GOVERNMENT.

**CITRUS CANCER.** See PLANTS, DISEASES OF.

## CITY AND REGIONAL PLANNING.

The existence in 1929 of over 700 city-, village-, and regional-planning bodies in the United States where there were none of either twenty-five years earlier, attests the rapid growth of a significant movement caused not only by city growth but also by an increasing consciousness of its many attendant problems. Since about 1920, practical recognition has been given to the fact that planning problems do not stop at city boundaries but extend to large tributary areas which often go beyond county and sometimes pass over state lines; hence, regional planning. In any new field, it is easier to plan than to execute. This is particularly true in one requiring education, then legislation, and then still more education before governing bodies will provide funds to widen and extend streets, to acquire and improve playgrounds, parks and reservations, to provide transit facilities, and to build civic centres or groups of public buildings, suit-

ably placed in parked areas. Consequently, in the city- and regional-planning fields, plans were far in advance of executed projects, or even projects fairly started; and what has gone beyond the paper stage is often piecemeal work. This is due largely to the difficulties of fitting into governmental framework the new parts essential for comprehensive city and regional planning.

In regional planning, the difficulties are still greater than in city planning, because regional areas embrace scores of governmentally independent cities, villages, and rural townships, not co-terminous with counties, often covering several counties, and not easily brought under a single governmental organization because of various obstacles, some human and some constitutional. In both city and regional areas, notably the former, various public improvements have been carried out, each independent of the other, but without much needed correlation, and not always with due regard for the entire area, even for the one class of engineering works—as streets, sewers, water supply, or parks. It is this correlation, through not only a master plan for each class of service but also by means of a grand master plan for all, that is the reason and aim of city and regional planning.

**Zoning.** After some years of city planning, much of which never got beyond the paper stage, partly because done by temporary voluntary bodies instead of by permanent governmental agencies, it became evident that dependable city planning rested on zoning; that is, upon determining, subject to reasonably frequent modification, what parts of a city shall be devoted to residences of various types—single, semi-detached, or apartment—what part to business, what to manufacturing, and where a few classes of industry actually or likely to be nuisances, but essential to at least a large city, shall be allowed. Permissible heights of buildings and percentage of lots built upon also are taken into consideration. Upon use and height of buildings and percentage of the ground covered by them depend density of population, street widths, kinds of pavement, size of water mains and sewers, transportation facilities, size, location and character of schools, playgrounds and parks, telephone and light service. The need for zoning did not become widely apparent until just before the entry of the United States into the World War.

The fact that zoning requires no construction outlay and comparatively little operating expense and that it prepares the way for the more orderly, more economical, and more efficient construction of several kinds of municipal works facilitated zoning at a time when many other municipal activities were almost at a standstill. Although not known by that name at the time, zoning in America was begun as early as 1904 by Boston, following State enabling legislation of 1898 and 1904 which empowered Boston to limit the height of building near the Public Library on Copley Square. In 1909 Los Angeles instituted zoning in a limited way. Two other cities zoned in 1913. In 1915 zoning was adopted by Neenah, Wis. What gave it its real start in America was the exhaustive study of the subject made in New York City, followed by the adoption of a remarkably complete zoning ordinance in 1916, under the State Enabling Act passed two years earlier. Two more cities adopted zoning in 1916 and four in 1917.

At the close of 1920, there were 38 zoned cities, and in the next year the number doubled. Prog-

ress was then rapid, so that at the end of 1928, according to figures gathered by the U. S. Department of Commerce, there were 742 zoned cities. These cities were located in 44 States and the District of Columbia. The only States without at least one zoned city in 1928 were Vermont, West Virginia, Montana, Wyoming, and New Mexico.

The distribution of the 742 zoned municipalities by States and years is shown by the accompanying table, compiled by the Division of Building and Housing of the U. S. Department of Commerce. New York led with 132 zoned cities, and was followed by New Jersey with 84; California, 72; Illinois, 66; Massachusetts, 62; Pennsylvania, 42; Ohio, 39; Michigan, 31. These eight States had 528 of the 742 zoned cities. It should be understood that the character of zoning varies greatly from city to city. These variations have been indicated in a list of zoned cities, by States, giving also dates of the various ordinances, which has been issued and revised from time to time by the U. S. Department of Commerce.

Zoning is effected by a city ordinance. When comprehensive, it prescribes the percentage of the area of lots which may be covered with buildings or sets a minimum limit on the depths of front and rear and the widths of side lots; the heights to which buildings may be carried, either specifically or in relation to street widths, but generally with provisions for towers and for carrying other limited parts of a building above the main cornice line by means of one or more setbacks; and the classes of buildings that may be erected, as, for instance, residence, business, or industrial. Generally, there are two or more subdivisions in each main class. For instance, there may be single-family, two-family, and apartment-house residence districts, or even many more subdivisions in this class.

**Constitutionality of Zoning.** The legal basis of zoning is the police power. Reliance should not be placed on the general grant of police powers by the State to the city but rather in specific State zoning legislation, preferably but not necessarily applicable to all the municipalities of the State. Since there was no such thing as zoning when many of the State constitutions were adopted, it has been considered necessary or advisable to secure constitutional amendments authorizing zoning in some States. Broadly, the power to authorize zoning rests with each State legislature, subject to the limitations of the constitution of its own State, and of the United States. A standard or model State-zoning enabling act was drawn in 1922 by a committee of experts appointed by Secretary of Commerce Hoover, and has been revised from time to time since. Acts modeled wholly or partly on this standard have been passed by many States.

Prior to the sweeping decision of the United States Supreme Court in the *Euclid* case (1926), summarized below, upholding the broad principles of zoning, State court decisions were in some cases strongly adverse to zoning and in others equally strong in support of its legality under the State constitution, depending largely upon the conservatism or broad social vision of the State judges. The *Euclid* decision established the fundamental principles of zoning so firmly as to leave little to the Federal district and State courts except to rule the reasonableness of properly drawn and equitably enforced zoning

ordinances. In 1923 there were two adverse decisions in the *New Jersey* Supreme Court, and one in the *Missouri* Supreme Court, while the *Louisiana* and *Wisconsin* courts upheld local zoning ordinances. The two adverse decisions in New Jersey were limited in application compared with those in the three other States. They were upheld on appeal, but in 1927 a State constitutional amendment giving authority for zoning was adopted by a heavy popular majority and in 1928 a statute putting it into effect was enacted.

The Missouri decision, in the highest State court, was sweepingly against zoning as outside the police power and confiscatory, while the Louisiana and Wisconsin decisions, also in the highest State courts, were as unconditionally sweeping in the opposite direction. The Missouri decision, four to three; held that the *St. Louis* zoning ordinance "provides for the taking of property for a public use without compensation and without a judicial hearing," is outside the police power, and would result in "confiscation pure and simple." The *New Orleans* zoning ordinance, sustained by the Louisiana Supreme Court in reversal of a lower court, rests on this authorization of zoning in the Louisiana constitution of 1921: "All municipalities are authorized to zone their territory to create residential, commercial and industrial districts and to prohibit the establishment of places of business in residential districts." The court held that the New Orleans ordinance "is a valid exercise of the police power" and not in violation of the Federal constitution. The Louisiana court even went so far as to declare that aesthetic considerations, as affecting "the comfort and happiness of the residents" of a district and sustaining "in a general way the value of property in a neighborhood," may be protected by a zoning ordinance. It also said: "An eyesore in a neighborhood of residences might be as much of a public nuisance, and as ruinous to property values in the neighborhood generally, as a disagreeable noise, odor, or menace to safety or health."

In the *Milwaukee* decision, given by the State Supreme Court of Wisconsin on Dec. 11, 1923, the court said in part:

If in the prosecution of governmental functions it becomes necessary to take private property, compensation must be made, but incidental damage to property resulting from governmental activities or laws passed in the promotion of the public welfare is not considered a taking of the property for which compensation must be made.

... It cannot be denied that a city systematically developed offers greater attractiveness to the house seeker than a city developed in a haphazard way. The one compares to the other as a well ordered department store compares to a junk shop.

By a unanimous decision of the Kansas State Supreme Court in a *Wichita* case, the validity of excluding a commercial building from a residence district was established. Included in the decision were these sentences: "There is an aesthetic and cultural side of municipal development which may be fostered within reasonable limitations. Such legislation is merely a liberalized application of the general welfare purposes of the State and Federal constitutions." See *National Municipal Review*, June 1923, for synopsis of case and decision.

**Euclid Zoning Decision.** The ruling decision on the constitutionality of zoning was handed down in 1926 by the United States Supreme Court (*Village of Euclid v. Ambler Realty Co.*, 272 U. S. 365; see 1926 *New International*

*Year Book*). It overruled a Federal District Court and upheld a zoning ordinance passed in 1922 by the Village of Euclid, Ohio, a suburb of Cleveland, having a population of about 7500. Despite the fact that the court accepted evidence designed to show that the market value of the tract of land in question for residential purposes, to which it was restricted by the zoning ordinance, was only \$125 per acre, while for the industrial use to which the owner wished to put the land it was worth \$10,000 an acre, the court upheld the ordinance as not against either the constitution of Ohio or Section 1 of the 14th Amendment of the Constitution of the United States. In the course of its opinion, in discussing nuisances, the court held, as applicable to placing business in a residence district: "A nuisance may be merely a right thing in the wrong place—like a pig in the parlor instead of the barnyard. If the validity of the legislative classification for zoning purposes be fairly debatable, the legislative judgment must be allowed to control." (*Radice v. New York*, 264 U. S. 292, 294.) After pointing out that some State courts have reversed their own decisions against zoning, the court reviews, with approval, lower court decisions upholding the exclusion of business buildings from residence districts, in the interest of "the health and safety of the community." The court also states:

The matter of zoning has received much attention at the hands of commissions and experts, and the results of their investigations have been set forth in comprehensive reports. These reports, which bear every evidence of painstaking consideration, concur in the view that the segregation of residential, business, and industrial buildings will make it easier to provide fire apparatus suitable for the character and intensity of the development in each section; that it will increase the safety and security of home life; greatly tend to prevent street accidents, especially to children, by reducing the traffic and resulting confusion in residential sections; decrease noise and other conditions which produce or intensify nervous disorders; preserve a more favorable environment in which to rear children, etc.

In both the United States and Canada, city planning is controlled by several States and provinces, and activities of the general government in that field are confined to advice, research, and the collection and dissemination of information. State activities in America have been confined to legislation except that in a few instances State departments or divisions of city planning have been created, notably in Massachusetts and Pennsylvania. In 1917 Canada, through its Department of Conservation and Development put out a model town-planning act for the benefit of such of the provincial Legislatures as might wish to pass acts dealing with the subject.

In 1919 the British Town Planning Act of 1909 was amended. An important change was a clause making town planning compulsory instead of permissive, the compulsory feature going into effect Jan. 1, 1923, in all places which by the Census of 1921 had a population of 20,000 or more. See *The New International Year Book*, 1919, for further details.

Regional planning received increasing attention since papers on the subject were presented to the National Conference on City Planning at its meeting in 1919 (see *Proceedings* of the Conference). Up to 1924, the subject had not gone beyond the study and report stage. By far the most notable undertaking of this kind, under the name, "Plan of New York and Its Environs," (changed later to "Regional Survey of New

York and Environs") was begun early in 1921 and first publicly announced in May, 1922, at a largely attended meeting of engineers, architects, city planners, publicists, and civic workers held in New York City at the call of the Russell Sage Foundation, the chief backer of the project. The plan included the entire metropolitan district of New York and New Jersey and all of Long Island and took in territory extending 40 miles south and west from the City Hall of New York into New Jersey, 60 miles north up the Hudson River Valley, 55 miles east into Connecticut and the whole of Long Island, taking in Bridgeport, Conn.; West Point, N. Y.; Princeton, N. J., and a large part of the New Jersey seacoast. The regional survey embraces some 5500 square miles with a resident population of some 10,000,000, living in over 400 communities. The work was in charge of a committee having Fred Eric A. Delano as chairman, with Thomas Adams as general director of plans and surveys. By 1929 the committee had published several of its proposed Survey volumes and a series of monographs and had under way two Plan volumes.

Los Angeles Regional Planning Conferences were held in 1922 and 1923. The committee on Municipal and Metropolitan Affairs of the Boston Chamber of Commerce made a report in 1922 on *Metropolitan Planning and Development in Boston and Its Environs*. In 1923 there was formed within the Metropolitan District Commission of Massachusetts a Division of Metropolitan Planning to investigate the transportation service and its coordination with roads, bridges, waterways, railroads, street railways, and other arteries of traffic. In January, 1924, a Minneapolis-St. Paul Metropolitan Planning Committee was organized to serve an area 25 miles in radius. This movement had been started by the Northwestern Section of the American Society of Civil Engineers. During 1923 the Regional Planning Association of America was formed, with Clarence S. Stein of New York City as secretary.

Up to the end of February, 1929, a list maintained by the U. S. Department of Commerce included 30 regional-planning commissions, official and unofficial, besides 649 official and 37 unofficial municipal-planning commissions. These ranged from bodies confined to counties to the tri-state organization covering metropolitan New York, Connecticut, and New Jersey, and a second tri-state body centering in Philadelphia to the National Capital Park and Planning Commission at Washington, the studies of which extend into Maryland and Virginia. Notable for accomplishment in cooperation with minor civil divisions has been the Chicago Regional Planning Commission, a voluntary organization. In New York State working under State legislation, the Niagara Frontier Planning Board (Buffalo) and the Onondaga County Regional Planning Board may be mentioned. See *Engineering News-Record*, Oct. 4, and Nov. 22, 1928, pp. 496 and 758 for the first two of a series of articles on regional engineering, by W. W. DeBerard, former chief engineer of the Chicago Regional Planning Commission.

Construction work to carry out city replanning improvements included large expenditures at Chicago for important street widenings and extensions, and also lesser improvements and set down the scale to the widening of streets for a block or two in small places at St. Louis, Detroit, Philadelphia, Boston, and elsewhere. Civil

groups at Cleveland, Denver, San Francisco, and smaller places have been developed.

**Civic Centre Projects.** Notable groups of public buildings were to be found in 1929 from coast to coast, only partly executed, as a rule, or else in the planning or at best the site-acquisition state. A simple but impressive group had been completed some years earlier at Springfield, Mass., consisting of a city hall and an auditorium, with a detached tower between them. In the District of Columbia, progress had been made on a revivification of the L'Enfant plan for grouping Federal buildings, adopted over a century ago, Department of Commerce, Internal Revenue, and Archives buildings had been authorized, and five others were projected on a large triangle bounded by Pennsylvania Avenue, Fifteenth and B Streets. The five additional buildings proposed but not authorized were for the Department of Labor, Department of Justice, a General Accounting Office, Independent Establishments and Interstate Commerce Commission. Progress also had been made on a plan for a municipal centre, also bounded on one side by Pennsylvania Avenue; a bill authorizing the District Commissioners to purchase land for the purpose, but carrying no appropriation, was signed by President Coolidge on Mar. 2, 1920.

At Rochester, the outcome of the subject was uncertain early in 1929, while at Buffalo, there was some definite accomplishment. The Cleveland group plan had several buildings completed along a mall leading up from the lake bluff, this being one of the earliest projects. At Cincinnati, a county court house had been built as a part of a group plan along the Central Parkway, a boulevard on the site of an abandoned canal. The City of Duluth dedicated a city hall in November, 1928, near the existing county court house and construction was to start in 1929 on a Federal building. Progress had been made at St. Paul on both a State and a city civic centre, plans for each having been approved by the city-planning board, but neither had been approved by the respective legislative and appropriating bodies, although the bonds had been voted for a city hall and court house and public-safety building, without specification of their sites.

At St. Louis, land had been partly acquired in 1929 for a memorial plaza and civic centre near the city hall; a civil courts building had been completed and steps were being taken for a municipal auditorium and convention hall, to be followed by a memorial building and, it was hoped, by a Federal building. Across from a park in front of the Colorado capitol, the State Office Building and the State Museum, an amphitheatre, Carnegie Library, and Colonnade to Civic Benefactors had been built and the surrounding area landscaped. Still further on, the city had bought land and torn down buildings for a site for city and county buildings, bids for the construction of which had been received. The United States Mint was on the corner of the next block. San Francisco built a city hall on a fire-swept area after the earthquake of 1906 and across the plaza fronting the city hall there stood in 1929 an auditorium and a State building. Several other buildings were projected as a part of this group. Los Angeles completed a large city hall in 1928 on part of a civic-centre site previously approved and set apart by the city and the county authorities. A Federal building on the site was in existence; funds for a State building were available, and a county

Court of Justice building was projected for early construction, to replace an old court house and a hall of records on the civic-centre site which will be torn down and the space they filled left clear. A "great circle" is included in the project, near a small circular plaza which is the original centre of the Pueblo Los Angeles, dating back to 1781.

New cities under construction in 1929, more or less like the "garden cities" of England, included Radburn, N. J., and Westchester, Ill., laid out *de novo* for populations of 25,000 and 98,000, respectively, the first as a self-contained city with business, industries, residences, and parks, the other a purely residential city, with facilities for business to meet local needs only. As a site for Radburn, the City Housing Corporation (New York City), bought 1,000 acres of land in the borough of Fair Lawn, between Paterson on the west and Hackensack on the east, some fifteen miles from New York City. After preliminary engineering studies, ground was broken Aug. 1, 1928. By Mar. 1, 1929, some streets had been provided with water, sewerage, gas, electric-light wires, and paving; 200 one-family houses and a large store and office building were nearly completed and plans had been made for a group of apartment buildings to house 1000 families. Additional housing at the rate of 1000 families a year was proposed. A feature of Radburn was the separation of automobile and pedestrian traffic, short stub-end residence streets extending either way from through-traffic streets, with gardens and walks between the houses, parks, and playgrounds behind them, and a school for each two or three blocks. Walks in the parks and underpasses beneath main vehicular streets enable children to go to school without crossing motor-vehicle routes at grade. The general scheme just outlined, adopted at Radburn and elsewhere, was thus characterized by Jacob L. Crane, Jr., in an article entitled "Turning City Streets Inside Out," in *The American Mercury*, March, 1929:

The specifications call for a large enough area to provide for group play, say at least 100 ft. wide and as long as the block happens to be. There should be no access for automobiles. Woodmar in Indiana, the Country Club District at Kansas City, an outlying development near Dallas and the Radburn project in New Jersey furnish examples. A two-thousand acre Illinois land operation now under development is laid out with interior playgrounds. . . . If we are to have suitable interior parks or playgrounds, we must turn our houses around and front them on open spaces. We could then push our houses back to the service-way which the street has become.

The new city of Westchester, Ill., was located on 2200 acres of undeveloped land, 13 miles west of Chicago. The project was laid out according to an article by one of the designing and constructing engineers (see *Engineering News-Record*, Feb. 21, 1929). Construction work on the first (500-acre) unit of this project was well under way early in 1929, with over \$3,000,000 spent or to be spent for streets, sewers, and street lighting.

**Bibliography.** Among the many books on city planning and allied subjects published since 1913 are Nolen, *City Planning* (New York) and *New Towns for Old* (Boston); Lewis, *The Planning of the Modern City*, followed by new edition in 1922 (New York); Adams, *Rural Planning and Development* (Ottawa, Canada); *Garden Cities and Back to the Land* (London); Moore, *Daniel Burnham, Planner of Cities* (Boston); Williams, *The Law of City Planning and Zoning*, on world-wide legislation and American

court decisions (New York); Baker, *Legal Aspects of Zoning* (Chicago); James, *Land Planning in the United States for the City, State and Nation* (New York); Kimball, *Manual of Information on City Planning and Zoning* (Cambridge, Mass.); Hughes and Lanborn, *Towns and Town Planning, Ancient and Modern* (London); Adshead, *Town Planning and Town Development* (London); Wier (editor) *Parks: A Manual of Municipal and County Parks* (New York). Consult also annual reports of *National City Planning Conference* (New York); *City Planning*, a quarterly (Boston) in which once a year is an annual survey; and *Town Planning Review*, a British quarterly. For more details regarding many of the projects and doings mentioned in this article, see issues of the *New International Year Book*.

to deal with social and industrial problems. Aside from the work carried on throughout the year by the executives and various committees, the Federation assembles annually to arrange its programmes, and to take its stand upon current public matters. At the 1924 meeting held in New York City, April 23-24, the department on current economic and political movements reported on industrial, social, and civic progress in the past fifty years. The discussion embraced the new economic policy of the American Federation of Labor, Soviet Russia, pacifism and militarism, and practical politics. A department of industrial relations was created on Dec. 30, 1924, in memory of August Belmont and Samuel Gompers, to alleviate the difficulties between employer and employees. In 1925 the New York Industrial Round Table convened

## ZONED MUNICIPALITIES—BY STATES AND YEARS

COMPILED BY UNITED STATES DEPARTMENT OF COMMERCE, DIVISION OF BUILDING AND HOUSING, SUBJECT TO FINAL REVISION

States	1904	1909	1913	1915	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	Totals
Alabama	..	..	..	..	..	..	..	..	..	..	..	1	..	2	1	..	4
Arizona	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	2
Arkansas	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	2
California	..	1	2	..	1	1	2	3	3	7	14	7	8	3	12	4	72
Colorado	..	..	..	..	..	..	..	..	..	..	1	..	2	..	..	2	5
Connecticut	..	..	..	..	..	..	..	..	..	..	..	1	7	3	4	8	18
Delaware	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1
Dist. of Col.	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1
Florida	..	..	..	..	..	..	..	..	..	1	1	2	3	5	1	..	12
Georgia	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	3
Idaho	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Illinois	..	..	..	..	..	..	..	..	3	10	16	12	4	15	4	2	66
Indiana	..	..	..	..	..	..	..	..	..	1	4	..	7	2	1	1	16
Iowa	..	..	..	..	..	..	..	..	..	..	1	1	5	2	4	2	14
Kansas	..	..	..	..	..	..	..	..	1	1	1	1	2	5	9	2	22
Kentucky	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	2
Louisiana	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	2
Maine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	3
Maryland	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	2	3
Massachusetts	1	..	..	..	..	..	..	1	1	8	4	10	16	6	10	..	62
Michigan	..	..	..	..	..	..	..	..	..	4	4	8	8	8	7	2	31
Minnesota	..	..	..	..	..	..	..	1	..	1	..	..	1	..	..	..	3
Mississippi	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1
Missouri	..	..	..	..	..	1	..	..	..	8	2	..	..	..	..	2	8
Montana	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Nebraska	..	..	..	..	..	..	..	1	..	..	..	..	1	8	..	2	7
Nevada	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	3
New Hampshire	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
New Jersey	..	..	..	..	..	..	..	4	19	30	19	4	1	..	2	5	84
New Mexico	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
New York	..	..	..	1	..	..	1	3	7	22	16	13	13	16	16	24	132
North Carolina	..	..	..	..	..	..	..	..	..	1	..	..	..	4	..	..	5
North Dakota	..	..	..	..	..	..	..	..	..	..	1	2	2	..	1	..	4
Ohio	..	..	..	..	..	1	1	2	..	6	8	2	5	4	6	4	39
Oklahoma	..	..	..	..	..	..	..	..	..	..	2	1	1	1	2	..	7
Oregon	..	..	..	..	..	..	..	..	..	..	1	1	..	1	..	..	3
Pennsylvania	..	..	..	..	..	..	..	..	..	1	2	1	1	4	..	..	9
Rhode Island	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
South Carolina	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	3
South Dakota	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	4
Tennessee	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	1
Texas	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	3
Utah	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
Vermont	..	..	..	..	..	..	..	..	..	2	1	2	..	1	2	..	8
Virginia	..	..	..	..	..	..	1	..	..	..	2	..	..	..	..	..	3
Washington	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
West Virginia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Wisconsin	..	..	1	1	..	..	2	1	2	3	4	3	2	5	4	1	29
Wyoming	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals by years	1	1	2	1	3	4	7	17	38	101	105	75	109	94	102	80	742
Grand total	1	2	4	5	8	12	14	21	38	76	177	282	357	466	560	662	742

**CITY MANAGER.** See MUNICIPAL GOVERNMENT.

**CIVIC CENTRES.** See CITY AND REGIONAL PLANNING.

**CIVIC FEDERATION, THE NATIONAL.** An American educational society, organized in 1900,

twice, once to discuss the possibility of eliminating industrial waste and controversy, and again to compare competitive and regulated industries. The department of subversive movements continued its opposition to Russian communistic activities in the United States.



The department of current economic movements devoted the year to a study of the effects of the Sherman Law. After a prolonged study of old-age pensions in the United States and other countries, the industrial welfare department issued, in 1925, the *Proposal upon Old Age Annuities*.

In 1926 the Round Tables discussed the problems of the coal industry in the United States, and the practicability of compulsory arbitration.

The department of political education completed, Nov 1, 1926, the campaign of the previous year, to rouse general interest in voting, and in other party activities. The industrial relations department advocated trade agreement in organized industry. In 1927 the movement to enlist the public in political affairs was continued under the department of active citizenship. According to the recommendations of the department of industrial relations, a commission was appointed to study: The Sherman Anti-Trust Act; government by injunction; the "yellow dog" contract; and the company union. In April, 1927, the department of industrial welfare published a second report on old-age pensions. In cooperation with the woman's department, it made a survey of the housing conditions in army posts. The woman's department also made a survey of illiteracy among adults, and investigated almshouses in New York, Pennsylvania, New Jersey, and Connecticut. The National Civic Federation sent various commissions to Europe in 1927 to study foreign social and industrial conditions.

In 1928 the work of the Federation continued along the lines instituted in the previous year. The efforts of the department of active citizenship were endorsed by both presidential candidates, and the interest in the election was unprecedented. In 1929 Elihu Root was honorary president of the organization, and Matthew Woll acting president. Headquarters were at the Metropolitan Tower, New York City.

**CIVIL SERVICE REFORM LEAGUE, NATIONAL.** An organization founded in 1881, to establish and promote the merit system of appointment, promotion, and removal of government officials throughout the United States. The League has continued its activity in investigating conditions in the Government, in protesting against violations of the law, and urging the extension of the merit system. As a result of its findings on the source of inefficiency in government departments during the War, President Wilson reorganized the Civil Service Commission in 1919. Clauses inimical to civil-service reform were struck out from the National Defense Bill, the Shipping and Defense Bills of 1916, and the 1920 Census Bill, although the Rural Credits Bill and the Volstead Bill were enacted without changes suggested by the League. A bill sponsored by the League which provided for the reorganization of the Foreign Service was enacted, a successful campaign was conducted in Colorado in cooperation with the local committee for a civil-service amendment to the constitution, and civil-service charters were secured with its aid in several important cities throughout the Nation. Under the Harding administration, the League protested the dismissal of the director and 30 employees of the Bureau of Engraving and Printing and the dismissal of A. P. Davis from the office of Commissioner of Reclamation. During 1928 the League sponsored legislation placing postmasters of the first,

second, and third classes in the competitive civil service, and urged legislation empowering the President to place in the competitive classified service all Federal positions then exempt by statute. It also urged the adoption of the recommendation of the Joint Congressional Committee to include in the competitive service all field positions in the Internal Revenue Service, and reported to Congress the need for the extension of the Civil Service Act to the District of Columbia service. The League was successful in 1928 in its campaign against the proposal made in Congress to include in the competitive service, without examination, the old prohibition agents, and succeeded in its efforts to have such positions filled after competitive examination. *Good Government* is the official organ of the League and the president in 1928 was George McAneny. Headquarters are at 8 West 40th Street, New York.

**CLAIR, MATTHEW WESLEY** (1865- ). A bishop of the Methodist Episcopal Church born at Union, W. Va., and educated at Morgan College, Baltimore. He was ordained to the ministry of the Methodist Episcopal Church in 1889, and held various charges in West Virginia and in the District of Columbia until 1919, when he became district superintendent in Washington. In 1920 he was made bishop and assigned to Monrovia, Liberia.

**CLAIRE, INA (FAGAN)** (1892- ). An actress and vocalist born at Washington, D. C., who opened her career by impersonations of Harry Lauder in vaudeville entertainment in 1907. She has spent her time between plays and vaudeville and is best known for her talent of mimicry. Some of her best parts included: Polly Shannon in *Polly with a Past* (1917); Jerry Lamar in *The Gold Diggers* (1919); and the wife in *Bluebeard's Eighth Wife*. She also starred in *The Awful Truth* (1923), *Grounds for Divorce* (1924), and *The Last of Mrs. Cheyney* (1925).

**CLAPP, CHARLES HORACE** (1883- ). An American geologist and university president, born at Boston, Mass. He was graduated in 1905 at the Massachusetts Institute of Technology, where in 1910 he received the Ph.D. degree. In 1905 he became instructor of geology at the University of North Dakota, and at the same time, assistant geologist of the State Survey. Two years later, he returned to the Institute of Technology. During 1908-15, he was geologist on the Geological Survey of Canada, and then for three years was professor of geology at the University of Arizona. He was called in 1916 to the chair of geology at the Montana School of Mines; in 1918 he became president of the School of Mines and in 1921, president of the State University of Montana. He was also director of the Montana Bureau of Mines, 1919-22, and assistant geologist of the United States Geological Survey 1914-25. His original investigations have to do with petrology and economic geology, on which subjects he has published many papers and reports.

**CLAPP, EDWIN JONES** (1881- ). An American economist, born at Hudson, Wis., and educated at Yale University and at the University of Berlin, Germany. During the period 1910-12, he taught economics at Yale and at New York University. From 1914 to 1920, he was professor of economics in New York University, and afterward was privately engaged in the study of economic problems. He wrote:

*The Navigable Rhine* (1911); *The Port of Hamburg* (1911); *Economic Aspects of the War* (1915); *The Port of Boston* (1916); *Railway Traffic* (1917); *The Port of Charleston* (1921), and *The Port of Baltimore* (1921). He was financial editor of the *New York American*, 1922-23, and editor, 1924. Later he served as staff correspondent and financial writer for the *Hearst newspapers*.

**CLARK, ALBERT CURTIS** (1859- ). An English classical scholar (see Vol. V). He became professor of Latin at Oxford University in 1913. His later works include *The Primitive Text of the Gospels and Acts* (1914); *Recent Developments in Textual Criticism* (1914); *The Descent of Manuscripts* (1918); *The Reappearance of the Text of the Classics* (1921).

**CLARK, BARRETT H (ARPER)** (1890- ). An author and editor born in Toronto, Canada. He is best known for his many books on the theatre, including *The Continental Drama of To-day* (1914); *British and American Drama of To-day* (1915); *Contemporary French Dramatists* (1915); *How to Produce Amateur Plays* (1917-25); *A Study of the Modern Drama* (1925); *Eugene O'Neill* (1926); *Oedipus or Pollyanna* (1927). He was editor of *The World's Best Plays* series, 58 vols. (1915-26); four titles in the Drama League's series (1914-18); Walter Pritchard Eaton's *Plays and Players* (1916); *Representative One-act Plays by British and Irish Authors* (1921); *Appleton Play-Book* (1926), and *Great Short Novels of the World* (1927). He is co-author of *The Rivet in Grandfather's Neck* (1921) and edited and translated many foreign plays. He was dramatic director of Camp Humphreys in the World War.

**CLARK, CHAMP** (1850-1921). An American politician (see Vol. V). From 1919 until his death, he was Democratic minority leader in the United States House of Representatives, having been Speaker in the House previous to that date. He was defeated in the election of 1920. He died in Washington, D. C., on Mar. 2, 1921.

**CLARK, CHARLES EDWARD** (1889- ). An American law teacher. He was graduated at Yale College in 1911 and at the Yale School of Law, *summa cum laude*, in 1913, and practiced at New Haven for six years. He was a member of the Connecticut Legislature in 1917 and became assistant professor of law in the Yale Law School (1919-22), associate professor (1922-23), and professor after 1923 (Lines Professor, 1927-29, and Starling Professor, 1929- ). In 1929 he was made dean of the Yale Law School. He is co-author of *Probate Law and Practice in Connecticut* (1915), and author of *Code Pleading* (1928), and *Real Covenants* (1929).

**CLARK, CLARENCE DON** (1851- ). An American senator (see Vol. V). He was appointed member of the International Joint Commission in 1919 and became chairman of the United States section.

**CLARK, GEORGE LUTHER** (1877- ). An American lawyer, born at Waynesville, Ohio. He graduated from Kenyon College in 1896, and studied law at Indiana University and at Harvard. From 1902 to 1904, he was instructor in law at Leland Stanford, Junior, University, and from 1904 to 1909 was professor of law at the University of Illinois. He held a like position at the University of Michigan from 1909 to 1912, at the University of Missouri from 1913 to 1921, at the University of Cincinnati, 1924-25, and at New York University after

1925. He is author of *Equity* (1919); and *Selected Cases on Equity* (1921).

**CLARK, JAMES TRUMAN** (1852-1922). An American railway official, born in Albany, N. Y. He was educated in the public schools of that city and began his railway service as messenger boy with the New York Central Railroad in 1870. In 1873 he joined the Chicago and Northwestern Railroad and was rapidly promoted to important positions with that line, becoming vice president in charge of traffic in 1899. From 1916 to 1922, he was president of the C. St. P. M. & O. Railway.

**CLARK, JOHN BATES** (1847- ). An American economist (see Vol. V). He retired from his Columbia professorship and from his post as director of the division of economics and history in the Carnegie Endowment for International Peace in 1923. In 1928 a volume of economic essays in honor of Professor Clark was published by his colleagues, friends, and former students.

**CLARK, JOHN MURRAY** (1860- ). A Canadian lawyer and scholar. He was educated at the University of Toronto. At one time, he was president of the Royal Canadian Institute, the most important learned society of the Dominion. He was appointed by the government to codify the mining laws of Canada. Among his publications are *The Law of Mines in Canada*; *Company Law*; *International Arbitration*; *The Future of Canada*; *Proportional Representation*; *Thermotics, Canada and the Navy*; *The Reign of Law*; *Canada's Gold and War Finance*; *Disallowance*; *The Virginia Experiment*; *Canada and Virginia*; *The Gold Standard and the Pre-Cambrian*; and *Geneva*.

**CLARK, J (OSHUA) REUBEN JR.** (1871- ). An American lawyer and diplomat. Born and reared in Utah, he studied at the Latter Day Saints' College, Salt Lake City, and at the University of Utah. After several years of teaching in his native State, he went to New York, where he was admitted to the bar and obtained the LL.B. degree from Columbia University. He was assistant solicitor of the State Department at Washington in 1906-10 and solicitor, 1910-13. He served as general counsel for the United States before the American British Claims Commission in 1913 and as counsel for the State Department and expert assistant to the American commissioners at the Conference on Limitation of Armaments in 1921. In 1927 he was retained by Ambassador Dwight W. Morrow as special counsel in negotiating a settlement of issues between the United States and Mexico. He was appointed Under Secretary of State in 1928 and at once gave particular attention to Latin-American affairs. In the Taft administration, under the direction of Secretary Knox, he prepared a memorandum, *The Right of the United States to Protect Its Citizens in Foreign Countries by Landing Forces*.

**CLARK, L (EON) PIERCE** (1870- ). An American neurologist and psychiatrist and a leading authority on epilepsy. Born at Ingle-side, N. Y., he received his medical degree from New York University in 1892 and became resident physician of the Craig Colony for Epileptics. After serving many years in this capacity, he settled in New York as a neurologist. In connection with the treatment of epilepsy he has of late years advocated psychotherapeutic measures as valuable and has made converts to

this view in this country and Great Britain. He has written assiduously on the subject of epilepsy for nearly 30 years. In 1926 he founded the *Archives for Psychoanalysis*.

**CLARK, SIR WILLIAM (HENRY) (1876- )**. A British public official, appointed High Commissioner in Canada in 1928. He was educated at Eton, Trinity College, and Cambridge University and after some years in the diplomatic service became private secretary successively to Lloyd George, Winston Churchill, and other public figures. In 1916-17 he was controller general of commercial intelligence in the Department of Board of Trade, and in 1917-28 controller general of the Department of Overseas Trade. He was knighted in 1915.

**CLARK, WILLIAM MANSFIELD (1884- )**. An American physiological chemist. He was born at Tivoli, N. Y., graduated at Williams College in 1907, and received the degree of Ph.D. at Johns Hopkins in 1910. He was research chemist in the dairy division of the U. S. Department of Agriculture, 1910-20, and professor of chemistry in the Hygienic Laboratory of the U. S. Public Health Service, 1920-27. After 1927 he was De Lamar professor of physiological chemistry at Johns Hopkins. In 1928 he was elected to the National Academy of Sciences. He is the author of *The Determination of Hydrogen Ions* (1920).

**CLARKE, SIR EDWARD GEORGE (1841- )**. An English lawyer (see VOL. V). He retired from the bar in 1914. His later works include: *The Book of Psalms: The Prayer Book Version Corrected* (1915); *The National Church* (1916); *The Story of My Life* (1918); and *Benjamin Disraeli: The Romance of a Great Career* (1926).

**CLARKE, JOHN HESSIN (1857- )**. An American jurist, born at Lisbon, Ohio. He graduated from Western Reserve University in 1877, and in the following year was admitted to the Ohio bar. From 1878 to 1880, he practiced at Lisbon, and after 1880 at Youngstown. He moved to Cleveland in 1897 where he remained until 1914. For many years he was general counsel of the New York Central and the St. Louis railroads. He served as United States district judge for the Northern District of Ohio from 1914 to 1916, and in the latter year was appointed associate justice of the Supreme Court of the United States. He resigned in 1923 in order to devote all his time to the interests of the League of Nations, of which he was an ardent supporter.

**CLARKE, JOHN MASON (1857-1925)**. An American geologist and paleontologist (see VOL. V). He was president of the Geological Society of America in 1916-17. His works include: *Organic Dependence and Disease* (1921); *James Hall of Albany* (1922); *L'Île Percée* (1923).

**CLARKSON COLLEGE OF TECHNOLOGY**. A college for men founded in 1896 at Potsdam, N. Y. The number of students increased from 104 in 1914 to 375 in the autumn of 1928 and the number of faculty members from 10 to 24; productive funds totaled \$700,000. In that year also the college received as a gift an estate of 625 acres which was the ancestral home of the Clarkson family. The moving of the institution to this site—Clarkson Hill—is contingent upon the receipt of additional funds for the purpose. Joseph Eugene Rowe, Ph.D., succeeded John F. Brooks, Sc.D., as president in 1928.

**CLARK UNIVERSITY**. A non-sectarian institution, comprising a college for men and a coeducational graduate division of arts and sciences, at Worcester, Mass., founded in 1889. The enrollment in the autumn of 1928 was 481, distributed as follows: Undergraduates, 236; graduate students, 65 (as compared with 94 in 1914); special students, 16; and extension students, 165; and in addition, there was a summer-session enrollment of 224. Between 1914 and 1928, the number of members in the faculty was increased from 21 to 40; the library was increased from 60,000 to 105,000 volumes; and the productive funds from \$2,400,000 to \$5,000,000. A graduate school of geography was established in 1921; a department of geology was added in 1922; special emphasis was given in 1923 and 1924 to studies in history, international relations, economics, and geography; and the publication of two new quarterly journals, the *Journal of Economic Geography*, and *Genetic Psychology* (*Monographs*) was begun in 1925. President, Wallace W. Atwood, Ph.D.

**CLASSICAL PHILOLOGY**. See **PHILOLOGY, CLASSICAL**.

**CLAUDEL, klôd'-êl', PAUL (1868- )**. A French diplomat, poet, dramatist, and member of the French Institute, who was born in Champagne at Villeneuve-sur-Fère, and educated in Paris. He frequented the Symbolist circles, attending Mallarmé's famous Tuesdays. Later, he entered the French consular service and was sent successively to the United States, China, Czechoslovakia, and Germany. During the World War, he was transferred to the diplomatic service, acting first as Minister to Brazil (1916) and Denmark (1919), and then as Ambassador to Japan (1921-26) and to the United States (1927- ). After his conversion to Catholicism at 20, he became a poet of mysticism, and broke with the French classical tradition of analytic clarity. He excelled in giving an impression of ensembles and was best known for his dramatic poems. He had a literary vogue both before and after the War, when *L'annonce faite à Marie* (1911) was played in Paris. Claudel's works include: *Vers d'Exil* (1895); *La Connaissance de l'Est* (1900); *L'Arbre* (1900-01); *L'Otage*; *Cette Heure qui est entre le printemps et l'été*; *Art poétique* (1907); *L'Echange*; *Le Partage de Midi*; *La Tête d'or*; *Le Repos du septième jour*; *La jeune fille Violaine*; *La Ville*; *La Connaissance du monde*; *Cinq grandes Odes* (1910); *Le Pain dur*; *La Nuit de Noël* (1914); *Corona bénigatilis*; *Poèmes d'été* (1914); *Poèmes de guerre*; *L'Ours et la lune* (1919); *Le père humilié* (1920); *Feuilles de Saints*; *Les Euménides d'Eschylle*; *Proteus* (1922); *L'oiseau noir dans le soleil levant*, social life in Japan, illustrated by Foujita (1927), and *Positions et Propositions* (1928). Quite a number of these works have been translated into English.

**CLAUSSEN, JULIA (1879- )**. A famous Swedish dramatic mezzo-soprano, born in Stockholm. After studying in her native city, Berlin, and Bayreuth, she made her début at the Royal Opera in Stockholm in 1903. During 1912-17 she was one of the principals of the Chicago Opera Company, appearing also as guest in London and Paris. Since 1917 she has been a member of the Metropolitan Opera Company. The extraordinary range of her voice (F-c2) enables her to sing with equal facility

high soprano rôles (Brünnhilde, Kundry, Aida) and low contralto rôles (Fides, Dalila).

- **CLAXTON, PHILANDER PRIESTLEY** (1862- ). An American educator (see Vol. V). He resigned as United States Commissioner of Education in 1921, becoming provost of the University of Alabama, 1921-23, and superintendent of schools at Tulsa, Okla., in 1923. He is also known as a member of several peace societies.

**CLAYTON, HENRY DE LAMAR** (1857- ). An American jurist. He was born in Barbour County, Ala., and graduated from the University of Alabama in 1877, and from the law department of the university in 1878. From 1893 to 1896, he was United States District Attorney, and in 1897 was elected to the 55th Congress, serving until May, 1914, when he was appointed district judge for the Middle and Northern Districts of Alabama. While in Congress, he was the author of the Clayton Act for the regulation of railways and was chairman of the Judiciary Committee in the 62d and 63d Congresses. In 1908, he served as permanent chairman at the Democratic National Convention.

**CLAYTON ANTI-TRUST ACT.** See TRUSTS.

**CLEARING HOUSES.** See FINANCE AND BANKING.

**CLEARWATER, ALPHONSO TRUMBOUR** (1848- ). An American jurist. He was born at West Point, N. Y., and was educated in public and private schools. In 1871 he was admitted to the bar and was elected district attorney of Ulster County in 1877, being re-elected several times. He was appointed justice of the Supreme Court to succeed Alton B. Parker, chosen chief judge of the Court of Appeals. He held many important positions both in legal and civil life, and was many times a delegate to national, State, and other conventions. He is the author of numerous papers and addresses on historical, patriotic, and biographical subjects, and served on many important legal commissions. He supervised the translation of the Dutch records of Ulster County, 1895-98. In 1925 he served as a commissioner on the consolidation of State departments. He is known as a collector of early American silver.

**CLEMEN, klēm'-ən. OTTO CONSTANTIN** (1871- ). A German theological historian born in Grimma. He studied theology and history, specializing on the Reformation. His principal works are *Johann Pupper von Goch* (1896); *Georg Helts, Briefwechsel* (1907); *Alcaian Chrosner* (1908); *Studien zu Melanchthons Reden und Gedichten* (1913); *Alle Einblatt-drucke* (1911); *Beiträge zu deutschen Kultur-geschichte aus Milau, Riga und Reval* (1919). Clemén is the editor of many pamphlets on the Reformation and the works of Luther.

**CLEMEN, PAUL** (1866- ). A German writer born at Sommerfeld. He studied philosophy and history, and later became professor of art history at Bonn and director of the art galleries of the Rhine provinces. In 1907-08 he was exchange professor at Harvard. He has written among other works: *Die Portraitdarstellung Karls des Grossen* (1889); *Der karolingische Kaiserpalast zu Ingelheim* (1890); *Merovinger und Karolinger Plastik* (1892); *Die Kunstdenkmäler der Rheinprovinzen* (1892); *Ruskin* (1900); *Die romanische Monumental-*

*malerei in den Rheinlanden* (1910); *Denkmalpflege in Frankreich* (1918); *Kunstschutz im Kriege* (1919); and *Belgische Kunstdenkmäler* (1921).

**CLÉMENTEAU, klá'man'só', GEORGES EUGÈNE BENJAMIN** (1841- ). A French statesman (see Vol. V), who had written and spoken about the possibility of war long before the World War began, urging the realization of the artillery programme. In September, 1914, his paper, *L'Homme Libre*, was suppressed on account of its violent criticism of the army medical services. Two days later, he issued *L'Homme Enchaîné*, in which he fought the policy of the Government. He also attacked them in the Senate. On the outbreak of War, he was president of the Foreign Affairs Committee, and later became president of the Army Committee of the Upper Chamber. His policy was directly opposed to M. Caillaux's (q.v.), as he advocated fighting to the finish. On Nov. 16, 1917, he succeeded M. Painlevé as Prime Minister, and formed his "Victory Cabinet," thus defeating the efforts of M. Caillaux. While he was in power during the War, his policy was drastic in regard both to the conduct of the War and to food restriction. This policy was accepted without opposition as long as the War lasted, but after the Armistice, his countrymen showed less confidence in him as a leader in peace-time. Attempts were made to drive him from office before the peace negotiations, but he remained in power until after the Peace Treaty was signed, presiding over the Peace Conference, as France's chief delegate. On Feb. 19, 1919, he was fired upon and wounded by a young anarchist, Émile Cottin. He was proposed as candidate of his party for the Presidency in 1920, but withdrew his name when he saw that he stood little chance of success against M. Deschanel. He then retired from politics, traveled in the Orient in that year and visited the United States in 1922. He became a member of the French Academy in 1918, and was given the doctor's degree at Oxford in 1921. *Démophilènes* (1926) and *American Reconstruction* (1928) were two of his late works. Consult *Clémenteau, sa vie—son œuvre*, by G. Gefroy and Lunet (1920).

**CLEMENT, ERNEST WILSON** (1860- ). An American teacher in Japan and writer on Japanese subjects (see Vol. V). He was vice president of the Asiatic Society of Japan from 1916 to 1921. In 1920 he resigned as special correspondent of the *Chicago Daily News*. His recent works include: *A Short History of Japan* (1915), *Constitutional Imperialism in Japan* (1916), and *Fifty Sessions of the Japanese Imperial Diet* (1925).

**CLEVELAND.** Fifth city in size in the United States. The population rose from 569,342 in 1910 to 796,841 in 1920, and to 1,010,300 in 1928, by estimate of the Bureau of the Census. The area of the city has increased from 51.83 square miles in 1914 to 70.67 square miles in 1928. Cleveland is the largest city in the United States operating under the city-manager plan of government. The necessary charter amendment was passed in November, 1921, and the plan went into effect in January, 1924. The Council consists of 25 members, who are elected in groups of five, six, seven, and seven from four large districts by proportional representation. The proposal to return to the federal form has been submitted to the voters several

times but defeated each time, although by not a very large majority. Among the important municipal building enterprises which Cleveland has undertaken in recent years have been the construction of the first units of the Union Terminal group, the erection of additional buildings on the Mall, and the development of the Western Reserve Medical Centre. The Terminal group will be a city within a city, and the cost of the entire enterprise will be approximately \$200,000,000. The Terminal Tower, 52 stories in height, will be the focal point of the group, which will include the enlarged Cleveland Hotel, a 12-story office building, a large department store, the 18-story Medical Arts Building, and the 18-story Builders Exchange Building. The entire project will occupy about 35 acres.

The Mall group, in the heart of the downtown section, is nearing completion as the result of favorable action on the part of voters on recent bond issues. Already constructed are the City Hall, the County Court House, the Public Auditorium, the Federal Building, Main Library, Plain Dealer Building, and Federal Reserve Bank Building. Wings to the large Auditorium provide a dozen smaller halls, one of which is an experimental theatre. A \$2,000,000 school headquarters building and a \$2,500,000 stadium are under construction.

The Western Reserve Medical Centre will consist of the following: Lakeside Hospital (\$3,600,000); Nurses' Dormitory (\$1,600,000); Rainbow Hospital (\$600,000); Western Reserve University Medical School (\$2,250,000); Western Reserve University Nursing School (\$750,000); Babies' and Children's Hospital (\$1,125,000); Maternity Hospital (\$1,500,000); Allen Memorial Library (\$600,000); Pathological Institute (\$750,000); and the Private Pavilion (\$800,000). Funds for the erection of the entire group have been provided by public subscription; and the Rainbow, Babies' and Children's, and Maternity hospitals, the Medical School, and the Library have already been constructed. The Medical Centre is part of a great educational and cultural development, the plans for which include Western Reserve University, Case School of Applied Science, the Cleveland Museum of Art, the School of Education, and several churches. See WESTERN RESERVE UNIVERSITY and CASE SCHOOL OF APPLIED SCIENCE.

Public utilities are being rapidly expanded. Chief of these, as the result of an \$8,000,000 bond issue approved in 1927, is the simplification of the communication over the Cuyahoga River Valley between the eastern and western sections of the city. About \$1,000,000 will be used for the purchase of land at the bridge approaches and \$7,000,000 for the structure itself. More than \$1,250,000 has been spent in purchasing and developing a municipal airport, located nine miles from the heart of the city. More than 1000 acres have been acquired, and nine hangars have been built. This airport is a division point for the New York-Chicago line and is considered one of the best in the United States.

As the result of a Federal road survey, Cleveland is spending approximately \$1,000,000 annually for the building of new streets and the extension and widening of existing ones. The development of its lake front is also under way. Plans call for filling in where needed, between Gordon Park on the east and Edgewater Park on the west, a distance of about six miles. Provision also has been made for extensive ware-

houses and wharf facilities, as well as an air field where planes may stop to take on or unload passengers, thus bringing that service within a few minutes from the downtown section. Another outstanding development is the metropolitan park system. More than 10,000 acres, located roughly on a 90-mile half-circle and consisting of nine units or reservations from 100 to 1000 acres in size, have been acquired.

The assessed valuation of property in Cleveland in 1927 was \$2,092,159,190; the tax revenue was \$20,036,305; and the bonded indebtedness is \$135,506,750. Cleveland has 1105 miles of streets, 934 of which are paved; 1000 miles of gas mains; 1050 miles of sewers; 2240 miles of water mains; and 418 miles of street railway. According to the U. S. Census of Manufactures for 1927, 2416 industries are established in Cleveland and Cuyahoga County, employing an average of 142,450 workers who are paid \$217,143,945 annually. Their output of finished products for 1927 was valued at \$1,121,102,411. Cleveland has 22 banks whose clearings in 1928 amounted to \$6,913,067,000; it is also the home of the Federal Reserve Bank of the fourth district.

Cleveland's Public Library, which was recently completed at a cost of \$4,500,000, is the centre of an extensive library system through which, in 1927, the circulation of books for home use amounted to 7,725,742. The public schools number 168, with an enrollment of 145,661 pupils and 4562 teachers; the parochial schools number 123, with an enrollment of 46,946 pupils and 1092 teachers. There are also five private schools and ten degree-conferring institutions.

**CLEVELAND, FREDERICK ALBERT** (1865- ). An American economist, born at Sterling, Ill., and educated at DePauw University and at the universities of Chicago and Pennsylvania. In 1900-03 he taught finance in Philadelphia and New York City. Thereafter he served on many boards and commissions dealing with economics, and notably, since 1907, on the bureaus of municipal research in New York and Philadelphia. He has held the chair of United States citizenship, Maxwell Foundation, Boston University, since 1919. His works include: *The Growth of Democracy in the United States* (1898); *Funds and their Uses* (1902); *The Bank and the Treasury* (1903); *Chapters in Municipal Administration and Accounting* (1909); *Railroad Promotion and Capitalization* (1912); *A Handbook of Municipal Accounting* (1913); *Organized Democracy* (1913); and *American Citizenship* (1927). He also collaborated on the following works: *Railroad Finance* (with F. W. Powell, 1913); *Democracy in Reconstruction* (with Joseph Schafer, 1919); *The Budget and Responsible Government* (with A. E. Buck, 1920); *National Expenditures and Public Economy* (addresses and papers; with S. M. Lindsay, 1921).

**CLEVINGER, GALEN HOWELL** (1877- ). An American metallurgist, born at Pike, N. Y. He was graduated at the South Dakota School of Mines in 1901. During 1901-05 he served professionally as a chemist and metallurgist to various mining companies, and then spent a year as instructor in metallurgy at Stanford, where, after three years in consulting practice, he returned and held professorial relations with that university until 1918, when he again resumed his consulting practice. During the World War, he was chairman of the section on metallurgy of the National Research Council,



and later became vice chairman of the Division of Engineering on the Council. He has invented various processes for the treatment of ores and is an accepted authority on gold extraction and on manganese-silver ores, as well as on electric smelting.

**CLIFFORD, SIR HUGH (CHARLES)** (1866- ). A British colonial administrator (see VOL. V). He was in charge of the administration of the British sphere of occupation in Togoland during and immediately after the World War, and was governor of the Gold Coast until 1919, when he became governor and commander-in-chief of Nigeria. He was governor of Ceylon from 1925 to 1927, and then became governor of the Straits Settlements and High Commissioner for the Malay States. He was created Knight of the Grand Cross of St. Michael and St. George in 1921. His writings during this period include: *The Further Side of Silence* (1916); *The German Colonies* (1918); *The Gold Coast Regiment in the East African Campaign* (1920); *A Prince of Malaya* (1920); *In Days that are Dead* (1927); and *Some Reflections on the Ceylon Land Question* (1927). He translated the Malay penal code and is joint author of a *Dictionary of the Malay Language*.

**CLIFFORD, LUCY JANE** (MRS. WILLIAM KINGDON) (?-1929). An English author (see VOL. V). She wrote the novels: *The House in Marylebone* (1917); *Mr. Webster and Others* (1918); *Miss Fingal* (1919); and the plays: *A Woman Alone* (1915); *Two's Company* (1915), and *Eve's Lover* (1927).

**CLIMATE.** See METEOROLOGY.

**CLOCK MOTOR.** See ELECTRIC MOTORS IN INDUSTRY.

**CLYNES, THE RT. HON. JOHN ROBERT** (1869- ). A British labor leader, born at Oldham, Lancashire, England. As a child, he worked in a cotton mill. He became a trade-union organizer, and was elected president of the National Union of General and Municipal Workers. He entered Parliament in 1906. He was Parliamentary Secretary to the Minister of Food (1917-18), Food Controller (1918-19); and chairman of the Parliamentary Labor Party (1921-22). He was a moderate of the trade-union side of the British Labor movement, and in 1924 was Lord Privy Seal and deputy leader of the House of Commons in Ramsay MacDonald's Labor cabinet. Later, he became deputy leader and deputy chairman of the Parliamentary Labor Party, a member of the National Executive Labor Party, and in 1929 Secretary of State for Home Affairs in the second Labor Cabinet. He received the honorary degree of D.C.L. from Oxford and Durham universities.

**COAL.** The coal industry throughout the world underwent many significant changes because of the World War and resultant political and economic conditions. As a prime essential to modern industry, coal was naturally important in the War; it was required on an extraordinary scale for the production of munitions. Some of the combatant nations were cut off from their ordinary sources of commercial supply and did not contain this essential within their boundaries.

In this period, the United States, which previously had become preëminent as a producer of coal, maintained its lead and increased its output. In Great Britain, no increase was effected in production. In France, destruction of the mines by the Germans resulted in a short-

age which was in no way met by the amount of coal actually turned over under the terms of the Armistice. Germany's loss of the mines of Alsace and Silesia, and temporarily of those in the Saar Basin and the Palatinate, naturally cut down production; in 1913 Germany exported more coal than it imported, but in 1922 the imports were in excess of the exports.

**Production in the United States.** The accompanying table showing world production and the percentage produced by the United States gives some idea of the relative increase in domestic production during the War and the subsequent return to the pre-war production status. The high percentage in 1926 was the result of the British strike.

When the United States entered the War, the industry was organized under government supervision to secure a maximum output and to stabilize prices. The coal committee of the National Council of Defense fixed a price in 1917; this was later repudiated by its chairman, Secretary of War Baker. After further consideration of the matter, on Aug. 21, 1917, President Wilson fixed a base price for coal, and on August 26, Dr. Harry A. Garfield was appointed fuel administrator. Notwithstanding a decline in the number of miners through military service, coal production picked up in 1918 and more than enough to meet the needs of the country was produced.

#### ANNUAL COAL PRODUCTION OF THE UNITED STATES

	(Net tons)		
	Anthracite	Bituminous	Total
1913	91,525,000	478,435,000	569,960,000
1914	90,321,000	422,704,000	513,025,000
1915	88,895,000	422,624,000	511,519,000
1916	87,573,000	502,282,000	589,860,000
1917	99,612,000	551,790,000	651,402,000
1918	98,826,000	579,386,000	678,212,000
1919	88,100,000	465,860,000	553,960,000
1920	89,598,249	563,490,845	653,089,094
1921	90,473,451	415,921,950	506,395,401
1922	54,683,022	407,694,000	462,577,022
1923	93,339,009	564,156,917	657,495,921
1924	87,926,862	483,686,538	571,613,406
1925	61,817,149	520,052,741	581,869,890
1926	84,437,452	578,290,000	662,727,000
1927	80,096,000	517,763,000	597,859,000
1928	76,734,000	492,755,000	569,489,000

The soft-coal region was the scene of a serious strike in 1919, when the miners demanded the permanent continuance of war-time wages; it was officially terminated December 10. The industry became increasingly efficient in 1920, with the aim of making good the shortages caused by the strike of the previous year; this was achieved in the face of a railway strike and failure to allot and handle railway cars properly. In 1922 conditions were very bad, with serious strikes in both the anthracite and bituminous fields.

During this period, there was increased cost of coal, and this resulted both in greater conservation and improved furnace equipment and operation, as well as the substitution of other fuels, such as crude oil, which could be operated more efficiently. The bituminous strike in 1922 paralyzed the union coal fields, but on the other hand, the non-union fields were able to produce as much as 5,000,000 tons a week, which could have been increased to possibly 6,000,000 or

even 7,500,000 tons in case of a national emergency. Various attempts were made to end this strike and conferences were called by the President of the United States, but without result. It was finally concluded with a victory for the United Mine Workers of America which forced the continuance all winter of the war-time wages.

Decreased production of both anthracite and bituminous coal featured the domestic industry in 1924. Prices in general were somewhat lower than in 1923. No car shortage prevailed and no important labor troubles developed. Despite the general industrial prosperity of 1925, the coal industry remained in a depression. Only the great anthracite strike which began on Sept. 1, 1925, and lasted until February of 1926 saved the bituminous producers from a more severe setback. Labor conditions in the bituminous

but as indicated in the preceding table production showed a marked decline.

**Mine Fatalities.** The mining of coal continued as a hazardous occupation in the United States. The total number of fatalities was lowest in 1922 of any year since the beginning of the War. Since 1922 the number of fatalities has been larger, in more or less direct connection with the increased production since that year. In 1928 one gas-explosion in an anthracite mine caused the death of ten men; and thirteen major explosions in bituminous mines resulted in the loss of 316 lives. The use of "permissible" explosives in increasing quantities is looked forward to as one of the best methods of decreasing coal-mine fatalities. The following statistics from the U. S. Bureau of Mines show the number of accidents in this field during recent years.

FATALITIES AT COAL MINES											
1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928 *
2,696	2,580	2,317	2,271	1,987	1,971	2,458	2,396	2,230	2,510	2,224	2,200 *

\* In part estimated.

fields were satisfactory, as the signing of a long-time wage agreement at Jacksonville, Fla., to run from Apr. 1, 1924, to Mar. 31, 1927, had removed the possibility of interruption by strike. Average sales prices in 1925 were cut by approximately 25 per cent and over 100,000 men were laid off because of the forced shutdown of many mines and production curtailment at others. The year 1926 was a period of large production in the bituminous industry and the depression felt since 1924 was temporarily less acute. During the year, four major short-time influences dominated the soft-coal market—a need for household fuel in place of anthracite during the first quarter, a large total consumption which reflected record industrial activity, a windfall export trade in the wake of a seven-month strike in the United Kingdom, and in the closing months of the year purchases for storage against the anticipated suspension in the union bituminous fields on Apr. 1, 1927. Production for November, 1926, was 59,213,000 tons, a gain of 2,013,000 tons over the previous monthly record set in October, 1919. The anthracite strike lasted 170 calendar days and was the longest in the history of the anthracite region. Despite the suspension of mining in the first six weeks of 1926, the year's production of anthracite nearly equalled the average of other recent years. On February 12, a new agreement was signed between miners and operators to run until Aug. 31, 1930. The agreement continued the wages and working conditions existing before the suspension, but provided that at any time after Jan. 1, 1927, either party might propose modifications in the wage scale, and means for considering such modifications were also provided. On Apr. 1, 1927, the looked-for strike in the bituminous coal mines became effective, continuing into 1928. Production of both grades of coal declined from 1926, a condition that is largely accredited to the unusually mild winter of 1926-1927. The export trade was featureless.

The year 1928 was featured by unemployment in many of the union-controlled districts. The proportion of non-union coal produced was considerably larger. Detailed statistics as to production and consumption are not yet available,

**Mechanization.** In recent years, there has been a great growth in mechanization of the American coal industry and, in addition to cutting machines and haulage locomotives, loading machines and conveyors are being increasingly employed. From approximately 2,000,000 tons in 1923, the production of bituminous coal by mechanized mining increased to 21,559,000 tons in 1928. These devices consisted mainly in devices to reduce the labor of hand shoveling into mine cars. In 1928 according to the United States Bureau of Mines, the following tonnage was produced by various types of devices: By mobile loading machines, 11,811,000 tons, or 54.8 per cent; by scrapers, 1,548,000 tons, or 7.2 per cent; by pit-car loaders, 4,117,000 tons, or 19.1 per cent; and by conveyors, including duckbills, 4,083,000 tons, or 18.9 per cent.

**World's Production of Coal.** The world's production of coal of all grades in 1928 was estimated by the U. S. Bureau of Mines at approximately 1,444,000,000 metric tons. (A metric ton is 2204.6 pounds, roughly the same as the gross ton of 2,240 pounds). Of the grand total, 217,000,000 tons were lignite, and 1,227,000,000 tons were bituminous coal and anthracite. In 1913, the last year before the World War, the production of lignite was 129,000,000 and the production of bituminous and anthracite, 1,213,000,000 tons. The output of lignite thus shows a very large increase over the pre-war level, chiefly on account of the rapid growth of the German lignite industry. The output of coal proper, on the other hand, shows an increase of only 1 per cent. Whereas, in the quarter-century before 1913, the production of bituminous and anthracite grew at the average rate of 31,000,000 tons every year, in the entire 15 years since then it has grown only 14,000,000 tons.

**British Coal Industry.** At the end of March, 1921, the policy of department control was ended in Great Britain, and the industry was restored to private ownership. This involved the reduction of wages and the abandonment of state subsidies. Already a point had been reached where, with the highest wages on record, there had resulted the lowest average output per miner ever recorded. Unemploy-

ment and strikes now developed in the industry, and readjustment was imperative; this, by the following year, was more or less satisfactorily accomplished. British wages this year decreased 40 per cent in the leading coal fields and, while coal was exported, it was at prices that did not permit of profit. In the following year, 1922, however, the industry was restored to a more normal basis, producing 255,891,786 metric tons; and in 1923 this was increased to over 260,000,000 tons. In 1924 production was well maintained at close to the 1923 mark. A considerably larger decline was noted in 1925, however, and in 1926 production was reduced by about 50 per cent by the national stoppage which reduced the total activity of the British coal trade to less than six months. This great strike was of major economic significance, not only to the British industry which suffered one of its most disastrous years, but to the United States and European countries which were called upon to furnish coal for British consumption, thereby increasing the activity and appearance of prosperity in some of the other important coal-producing countries of the world during 1926.

The British coal industry during 1927 passed through three more or less distinct phases. The first period was one of optimism, great activity, and remunerative trade—a natural reaction from the disastrous stoppage which came to an end toward the close of 1926. The second period was one of intense competition, particularly for the regaining of export markets, with steadily and rapidly declining price-levels, increasing unemployment, substantial trading losses, and general depression throughout the industry. In the third period, which comprised the closing months of the year, depressed conditions and trading losses continued, and, largely as a result, there was a growing tendency toward reorganization and reconstruction of the industry to meet the changed conditions prevailing in the world coal trade. An outstanding feature of the year was the recovery of productive activity to a level exceeding that in the period immediately preceding the 1926 stoppage.

In 1928 further progress toward the industry's return to normalcy was recorded. A definite end to the long-continued drop in prices was noted and the markets exhibited a more buoyant air. Continental nations showed signs of opening their markets to British coal once more and the general feeling was that really substantial progress was being made in the rehabilitation of the British coal industry.

**French Coal Industry.** Recent years have marked great progress in the restoration of France's coal-producing industry. Following the nearly complete destruction of the French

mines by the Germans during the War, the output was steadily built up until in 1924 it passed the pre-war mark recorded in 1913. Since 1924 the progress has been equally good as the accompanying table indicates.

**German Coal Industry.** The unsuccessful outcome of the War was indeed serious for Germany, so far as the coal industry was concerned, in its bearing on manufacturing. In 1913 the German coal production was in excess of 190,000,000 metric tons of bituminous coal and 87,000,000 tons of lignite, in addition to coke and briquettes, as specified in the accompanying table. Of this amount, Germany was able to export 34,598,408 tons, or an excess of 24,058,339 tons over domestic consumption. Naturally, during the War, the exports of Germany were confined to adjacent neutral countries; after the Armistice, Germany was stripped permanently of coal lands which had been considered invaluable to its industry.

#### PRODUCTION OF COAL AND FUEL IN THE GERMAN EMPIRE

	(Metric Tons)		
	1913	1922	1927
Bituminous	190,109,440	129,964,597	153,598,000
Lignite	87,283,084	137,207,125	150,805,000
Coke	34,630,391	29,664,291	32,260,000
Bituminous briquettes	6,992,499	5,562,811	4,971,000
Lignite briquettes	21,498,397	29,466,149	36,463,000

In 1922 the German inland requirements of bituminous coal were estimated at 150,000,000 tons, and for this, as will appear in the accompanying table, approximately 130,000,000 tons were available. The loss of coal-production capacity in Germany was due first to the fact that rich coal areas in Upper Silesia, which in 1913 had produced 32,500,000 tons of coal, or 17 per cent of the entire product of the nation, were allocated to Poland, while Alsace-Lorraine, which in 1913 had produced 4,790,000 tons, was returned to France. In addition, Germany lost the Saar Basin and the Palatinate for 15 years, at the end of which a plebiscite was to be taken to determine the sovereignty of these areas, which, in 1913, produced 12,223,000 tons of coal; in 1920, 9,410,433 tons, and in 1921, 9,574,602 tons. Furthermore, the German coal industry was restricted by reduced hours of labor, which were materially decreased from those prevailing before the War, while labor itself was marked by less efficiency.

Industrial activity in Germany was enhanced by the operation of the Dawes plan. The loss of the higher-grade coal mines is plainly reflected in the accompanying table which shows that the percentage of lignite produced is increasing with great rapidity. Germany was a leader in the rationalization-of-industry movement that followed the World War and it appears that this movement will do much toward the reestablishment of German industry on a plane not far below that existing prior to the War. The trend of production undoubtedly is upward and an equable settlement of the reparations plan will doubtless do much to improve the industrial situation further. In 1928 the total anthracite and bituminous coal from German mines amounted to 150,900,000 metric tons.

**Belgian Coal Industry.** The fact that the Germans did not completely destroy the Belgian mines, as they had those in France during the War, worked to the advantage of the programme

#### PRODUCTION OF COAL IN FRANCE (Metric Tons)

1913	40,844,218
1914	26,568,258
1915	19,523,863
1916	21,310,000
1917	28,891,728
1918	25,000,000
1919	22,476,766
1920	25,274,304
1921	28,940,473
1922	31,940,845
1923	38,543,670
1924	44,955,320
1925	48,033,564
1926	52,467,522
1927	52,846,698
1928	52,530,000

of rehabilitation that was started upon immediately following the Armistice. The low point of production was recorded in 1918 when 13,887,600 metric tons of coal was produced. By 1927 this figure had been increased to 27,573,550 metric tons. Present output is in excess of domestic consumption though with the return of Belgian industry to its pre-war level of activity, some of the additional requirements will need to be fulfilled by the import trade.

Consult current issues of *The Coal Age*, and also Part 1; *Atlas of Commercial Geology*, "Mineral Resources and Mineral Industry."

#### WORLD'S PRODUCTION OF COAL (In Metric Tons)

	Production in part (Estimated)	Per cent Produced by United States
1918	1,341,000,000	38.5
1914	1,208,000,000	38.5
1915	1,190,000,000	40.5
1916	1,257,000,000	42.7
1917	1,325,000,000	44.6
1918	1,332,000,000	46.4
1919	1,168,000,000	43.1
1920	1,319,000,000	45.3
1921	1,136,000,000	40.4
1922	1,208,000,000	34.6
1923	1,360,000,000	43.9
1924	1,357,000,000	38.2
1925	1,361,000,000	38.7
1926	1,355,000,000	44.9
1927	1,475,000,000	40.6
1928	1,444,000,000	39.4

**COAL LOADERS.** See **ELECTRIC MOTORS IN INDUSTRY.**

**COAL STRIKE.** See **COAL; STRIKES AND LOCKOUTS.**

**COAST DEFENSE.** See **ARTILLERY.**

**COATES, ALBERT** (1882- ). A British orchestral conductor, born (of an English father and a Russian mother) at Petrograd. Although he had studied piano with an older brother, he did not decide on a musical career until he was 20. He then entered the Leipzig Conservatory, where his teachers were Teichmüller (piano), Klengel ('cello) and Nikisch (conducting). He made his debut as conductor with Offenbach's *Contes d'Hoffmann* in Leipzig. Upon the recommendation of Nikisch, he was appointed principal conductor of the Elberfeld opera in 1906. After a short time as Schuch's assistant in Dresden, he went to Mannheim as coördinate conductor with Bodanzky. Here, the director of the Imperial Opera at Petrograd heard him and engaged him in 1911 for that institution, where Coates remained through the horrors of the revolution until 1919. In 1914 he made his first appearance in London, alternating with Bodanzky in the first performances of *Parsifal* in England. In 1919 he returned as conductor for Beecham's operatic company, directing also some concerts of the London Philharmonic Society and of the Symphony Orchestra. On Dec. 30, 1920, he made his American debut with the New York Symphony Orchestra with emphatic success, and for two seasons he alternated with Damrosch. During the summer of 1923, he conducted a season of Russian opera at Barcelona, and in 1924 and 1925 he was the guest-conductor of the Rochester Symphony Orchestra for the second half of the season. During the summer of 1928, he was heard at the Hollywood Bowl, in California, and the Stadium Concerts in New York. He has made a vast number of records for the Victor Company, especially of extended

excerpts from Wagner's works. He is the composer of an opera, *Sardanapalus* (Petrograd, 1916), a symphonic poem, *The Eagle* (Leeds Festival, 1925), and of some orchestral works, in smaller form.

**COATES, THE RT. HON. JOSEPH GORDON** (1878- ). A New Zealand statesman, who was born in Matakohē, educated at the public school there. He was elected to the House of Representatives in 1911, served with the British forces in France, 1917-19, and became Minister of Justice (1919-20), Postmaster General and Minister of Telegraphs (1919-25), Minister of Public Works (1920-26), of Native Affairs (1921-28), and of Railways (1923-28). In 1925 he became Premier, retaining the last two portfolios and adding that of External Affairs in 1928. In 1926 he was made a member of the Privy Council. In December, 1928 a "no confidence" vote forced his resignation.

**COBB, FRANK IRVING** (1860-1923). An American editor and writer, born in Shawnee County, Kan. He was educated in the public schools and at the Michigan State Normal School, beginning newspaper work for the Grand Rapids *Herald* when he was 21 years old. Before being invited to New York by Joseph Pulitzer, he had been chief editorial writer on the Detroit *Free Press* (1900-04), having just previous to that been on the Detroit *Evening News*. Mr. Cobb directed the editorial page of the New York *World* for 20 years (1904-23), and became recognized as, perhaps, the strongest writer on the New York press since Horace Greeley. He has been described as a writer who shunned sophistry and wrote sincerely and simply. Though his editorials were not signed and were written for a paper that he did not own, he became a powerful personality in the United States. In October, 1918, Mr. Cobb was drafted into national service as an unofficial adviser at the Peace Conference, where he was an admirer of President Wilson and a firm advocate of the League of Nations.

**COBB, IRVIN S (HREWSBURY)** (1876- ). An American author, born at Paducah, Ky., and educated at the common schools and in private academies. He began as a reporter for papers in Paducah and Louisville. From 1904, when he became editor of the humorous section of the New York *Evening Sun*, he was section editor or contributor to New York newspapers, notably the *World*. In 1911 he became a staff contributor to the *Saturday Evening Post*, for which he was also war correspondent in Europe at intervals between 1914-18. Among his numerous works are the following: *Funabashi* (a musical comedy, 1907); *Mr. Busyboddy* (musical comedy, 1908); *Back Home* (1912), produced as a comedy (1915); *Cobb's Anatomy* (1912); *The Escape of Mr. Trimm* (1913); *Cobb's Bill of Fare* (1913); *Roughing It de Luwe* (1914); *Europe Revised* (1914); *Paths of Glory* (1915); *Old Judge Priest* (1915, 1923); *Fibble, D.D.* (1916); *Speaking of Operations* (1916); *Local Color* (1916); *Speaking of Prussians* (1917); *Those Times and These* (1917); *The Glory of the Coming* (1918); *The Thunders of Silence* (1918); *The Life of the Party* (1919); *From Place to Place* (1919); *Oh, Well, You Know How Women Are!* (1919); *The Abandoned Farmers* (1920); *A Plea for Old Cap Collier* (1921); *One Third Off* (1921); *Sundry Accounts* (1922); *Stickfuls* (1923); *A Laugh a Day Keeps the Doctor Away* (1923); *The*

*Snake Doctor* (1923); *Goin' on Fourteen* (1924); *Here Comes the Bride!* (1925); *Some United States* (1926); *Ladies and Gentlemen* (1927); *All Aboard* (1928); *Red Likker* (1929), and numerous series in periodicals. He also collaborated on dramatic productions.

**COBB, TYRUS RAYMOND** (1886- ). Professional baseball player, born at Narrows, Ga. After a brief stay in the minors, he joined the Detroit Club of the American League in 1905, becoming manager of that club, 1920-26. He played the seasons of 1927 and 1928 with the Philadelphia Athletics. He is regarded as one of the best all-round players America's national game has ever developed, being especially renowned as a batsman and in his earlier career for his speed on the base paths. See *Ty Cobb, the Idol of Baseball Fandom*, by Sverre O. Braathen (1928).

**COBERN, CAMDEN MCCORMACK** (1855-1920). An American professor of theology, born at Uniontown, Pa., and educated at Allegheny College, Boston University, and in Europe. He was ordained to the ministry of the Methodist Episcopal Church in 1878, and was thereafter member of several conferences. In 1906 he became professor of the English Bible and the philosophy of religion in Allegheny College. Among his works are *Ancient Egypt in the Light of Modern Discovery* (1892); *A Critical Commentary on the Books of Ezekiel and Daniel* (1901); *Bible Ditchings of Immortality* (1905); *Recent Explorations in the Holy Land* (1914); *Studies of Immortality* (1916); and *The New Archaeological Discoveries and Their Bearing upon the New Testament and upon the Life and Times of the Primitive Church* (1917, 1921).

**COBLE, ARTHUR BYRON** (1878- ). An American mathematician, born at Williamstown, Pa. He was graduated at Pennsylvania College, Gettysburg, in 1897, after which he studied at Johns Hopkins University. He was instructor in mathematics at the University of Missouri in 1902-03. After a year of research work, he returned to Johns Hopkins as instructor in mathematics and continued there until 1918, attaining in 1909 an associate professorship. In 1918 he was called to the chair of mathematics at the University of Illinois. Called to Johns Hopkins as professor of mathematics in 1927, he returned to Illinois the following year. Among the subjects on which he has published the results of his studies are the theory of invariants, groups and correspondences, the quintic and sextic equations, symmetric binary forms and involutes, point set and cremona groups, and porisms. He was an associate editor of the *American Journal of Mathematics* during 1915-19.

**COBURN, CHARLES DOUVILLE** (1877- ). An actor-manager born at Macon, Ga. When he was 18, he became manager of the Savannah (Ga.) Theatre and two years later took up the stage as a profession. He played in stock through the Middle West and starred in *The Christian* and other plays. The Coburn Players were organized by him in 1905 for the production and promotion of the classic drama. He owns and controls the American and Canadian rights to *The Yellow Jacket* and *The Better 'Ole*. It was this last production which gave him his reputation. He created the rôle of "Old Bill" and later of "French Leone" (1920-21). He produced *So This Is London* (1922-24), *The Farmer's Wife* (1925), *The Right Age to Marry*, and *Old Bill, M. P.* (1926).

**COBURN, MRS. FORDYCE**. See **ABBOTT, ELEANOR HALLOWELL**.

**COCHIN, kô'shân', HENRY DENYS BENOIT MARIE** (1854-1927). A French writer and legislator (see VOL. V), who in 1914, retired from the Chamber of Deputies in favor of his son. His later works include: *Les deux guerres* (1917); *L'œuvre de guerre du peintre Albert Besnard* (1918), and a translation of *Les triomphes*, by Petrarca (published in the collection *Les cent chefs-d'œuvres étrangers*, 1920). He also wrote "L'art chrétien sur les confins des XIX<sup>e</sup> et XX<sup>e</sup> siècles," in *La vie Catholique dans la France contemporaine* (1918), and "L'âme du Nord," in *Le Nord dévasté* (1920). Consult "Un humaniste chrétien," by Maurice Denis in the *Revue hebdomadaire* (Paris) Année 36, vol. 10 pp. 591-607 (1927).

**COCHIN-CHINA**. See **FRENCH INDO-CHINA**.

**COCHRAN, kô'ran, CHARLES BLAKE** (1873- ). A theatrical manager born in Sussex, England. He was educated at Oxford, became an actor and made his first appearance in New York. Subsequently, he was press representative to various theatres, circuses, and exhibitions in the United States. For three years, he was personal representative of the late Richard Mansfield. After 1917 he became responsible for the productions of the Oxford Theatre and produced *The Better 'Ole*. His other successes include: *In the Night Watch* (1918); *The Man Who Came Back* (1920); *The League of Nations* (1921); *As You Were* (1918). Since 1926 he has been manager of Albert Hall. He wrote *The Secrets of a Showman* (1925).

**COCKRAN, WILLIAM BOURKE** (1854-1923). A distinguished American lawyer and orator (see VOL. V). He was active throughout his career in Democratic politics and was at the time of his death a member of Congress.

**COCTEAU, kô'kô', JEAN** (1891- ). A French poet and pamphleteer born at Maison-Laffite, France, whose work was a barometer of contemporary developments in art and music. Thus, he wrote both Cubist and Dadaist poems, besides pamphlets in which he justified his own evolution. He did not hesitate to condemn his own works after he came to a new point of view in regard to the art of literary expression. He seemed more at ease in the pamphlet than in any other type of writing, his most brilliant and successful work being perhaps, *Le Coq et l'arlequin: Notes autour de la musique* (1918). His first novel, *Le Grand écart*, appeared in 1923 and, like his poems, it was impressionistic. His other works include: *La Lampe d'Aladin* (poem, 1909); *Le Prince frivole* (poems, 1910); *La Danse de Sophocle* (poems, 1912); *L'Art décoratif de Léon Bakst* (with Arsène Alexandre, 1914); *Prélude à l'après-midi d'un faune* (with others; 1915); *Le Cap de Bonne-Espérance*; *Potomak* (dedicated to Stravinsky, and afterward condemned by the author); *Parade* (a ballet with music by Eric Satie, 1917); *Les Moris de la tour Eiffel*; *Thomas l'imposteur* (1923); *Dessins* (1923); *Lettres à Jacques Maritain* (see also his *Réponse à Jean Cocteau*, 1926); *Orphée* (1927), and *Edipe-Roi*; *Roméo et Juliette* (1928).

**CODLING MOTH**. See **ENTOMOLOGY, ECONOMIC**.

**COD-LIVER OIL**. See **FOOD AND NUTRITION**.  
**CODY, VEN. HENRY JOHN** (1868- ). A Canadian educator and clergyman (see VOL. V). He was Archdeacon of York, Canada (1909-19).



In 1914-15 he was a member of the Ontario Commission on Unemployment. He was Minister of Education in the same province in 1918-19, and in 1921 chairman of the Commission on University Finances in Ontario. Elected Archbishop of Melbourne, Australia, in the same year, he declined the office. At Geneva, in September, 1926, he preached the English sermon for the Seventh Assembly of the League of Nations.

**COE COLLEGE.** An institution at Cedar Rapids, Iowa, founded in 1881. The student enrollment in Liberal Arts increased from 742 in 1918 to 831 in the year 1928-29, with 307 in the college in the summer of 1928. The faculty was increased in the same period from 47 to 75 members, and the library from 15,920 to 30,655 volumes. During 1928 a gymnasium costing \$250,000 was being erected. Harry Morehouse Gage, D.D., LL.D., succeeded John Abner Marquis, D.D., LL.D., as president in 1921.

**COFFIN, HENRY SLOANE** (1877- ). An American clergyman and author, born in New York, educated at Yale University, at New College, Edinburgh, the University of Marburg, and the Union Theological Seminary, New York. He was ordained to the Presbyterian ministry in 1900, and after five years as pastor of the Bedford Park Church, New York, was appointed to the Madison Avenue Church in the same city in 1905. In the previous year, he had been named associate professor of practical theology in the Union Theological Seminary. He resigned the pastorate in 1926, becoming president of the Seminary. He was several times preacher to universities, including Yale and Harvard. Aside from editing and collaborating, he wrote a number of books, among them: *The Creed of Jesus* (1907); *Social Aspects of the Cross* (1911); *The Christian and the Church* (1912); *University Sermons* (1914); *The Ten Commandments* (1915); *Christian Convictions* (1915); *In a Day of Social Rebuilding* (the Lyman Beecher Lectures, at Yale University, 1918); *A More Christian Industrial Order* (1920); *What is there in Religion?* (1922); *Portraits of Jesus Christ* (1926); and *What to Preach* (1926).

**COFFMAN, DE WITT** (1854- ). An American naval officer, born in Shenandoah Co., Va. He graduated from the United States Naval Academy in 1876. During the Spanish-American War, he served on the *Terror*. He was appointed lieutenant commander in 1899; commander in 1905; captain in 1909, and rear-admiral in 1914. He served in many capacities, both ashore and afloat, and in 1916 was commander of the 3d Division of the Atlantic Fleet. Later in the same year, he commanded the 6th Division of the Atlantic Fleet, and, in June, 1916, he was promoted to the rank of vice admiral. He commanded the second battleship force in 1918 and in the same year was given the command of the 5th Naval District and Naval Operating Base at Hampton Roads. On Nov. 28, 1918, he was retired by operation of law. He was a member of the Board of Awards, Medals and Honors until Oct. 30, 1919.

**COGHLAN, kög'lan, SIR TIMOTHY AUGUSTINE** (1856-1926). An Australian statistician (see Vol. V). He was created knight in 1914 and Knight Commander of the Order of St. Michael and St. George in 1918. He was again Agent General for New South Wales in 1916-17 and 1920-25. In 1918 he published *History of Labour and Industry in Australia* (4 vols.).

**COHAN, GEORGE M (ICHAEL)** (1878- ). An American playwright and producer (see Vol. V). His recent successful plays and productions include: *Hit-the-Trail Holiday*; *Abie's Irish Rose*, written by Anne Nichols; *The Song and Dance Man*, *The Rise of Rosie O'Reilly*, a satire on Cinderella, and *The Merry Malones* (a musical play, 1927).

**COHEN, BELA.** See KUN, BELA.

**COHEN, JULIUS HENRY** (1873- ). An American lawyer. He was born in Brooklyn, N. Y., and was graduated from the Law Department of New York University in 1896. In the following year he was admitted to the bar and began practice in New York City. He served as city attorney of the Transit Reform Committee of One Hundred (1900 to 1905) and as special counsel to the Public Service Commission and to the Port of New York Authority. He was a member of several legal societies and was the author of *Law and Order in Industry* (1916); *The Law—Business or Profession* (1916); and *American Labor Policy* (1918). He was a frequent contributor to legal periodicals.

**COHEN, MORRIS RAPHAEL** (1880- ). An American professor of philosophy born in Minsk, Russia. Taken to America when still a child, he was educated at the College of the City of New York, and pursued graduate studies in philosophy under Royce and James at Harvard, receiving the doctorate in 1906. He taught mathematics and philosophy at the College of the City of New York and at intervals at Columbia University, Johns Hopkins, and the New School for Social Research (New York), after 1923. Professor Cohen also contributed polemical writings on political and social questions to the *New Republic* and other journals.

**COHEN, OCTAVUS ROY** (1891- ). An American author, born in South Carolina where he received his secondary and college education. At first an engineer, he soon drifted into journalism, which he relinquished for authorship in 1915. He immediately became popular as a result of his stories printed in the *Saturday Evening Post* which concerned themselves with the adventures of the Southern Negro. If his people seemed to possess the usual mythical Negro qualities of drollery and miscomprehensions, his tales at any rate were spirited. Among others he wrote: *Polished Ebony* (1919); *Gray Dusk* (1920); *Come Seven* (1920); *Highly Colored* (1921); *Midnight* (1922); *Dark Days and Black Knights* (1923); *Bigger and Blacker* (1925); besides some plays and mystery romances.

**COKE.** Subsequent to 1914, many important developments were recorded in the manufacture of coke which normally requires about 15 per cent of the bituminous coal produced in the United States. When the demand for coke is active, the requirements are between 75 and 85 million tons of raw coal a year for smelting the ores of iron and other metals, as well as for use in foundries, and as a smokeless domestic fuel. The production of beehive coke involves the loss of many valuable by-products, as benzol, toluol, and ammonia, which could be obtained by the distillation of coal in the by-product oven, and for which there was an increased demand at the beginning of the World War, for use in the manufacture of explosives. In 1919, 56 per cent of all the coke manufactured in the United States was made in by-product ovens, and by 1928 the percentage had increased to 91.8 per cent.

The economic advantage of the use of the by-product oven is shown by the fact that a ton of coal of 2000 pounds so treated would yield approximately 19 pounds of sulphate of ammonia, 7.1 gallons of tar, 2.4 gallons of crude light oil, 10,500 cubic feet of gas, and 1425 pounds of coke. The ammonia thus obtained can be used in refrigeration, for the manufacture of high-explosive ammonia nitrate (see EXPLOSIVES), and for making the fertilizer ammonium sulphate. From the tar are derived many organic compounds, such as the aniline dyes, and the ultimate residue, coal-tar pitch, is employed in road making, in making roofing, and as a binder for the fuel briquettes. In refining the tar, some crude light oil is obtained but much more is secured by washing the coke-oven gas. The crude light oil is valuable inasmuch as it yields benzol, the base of picric acid, and toluol, the base of the explosive trinitrotoluol, or TNT, which was employed so extensively in the World War. The distillation of coal is also important for its yield of illuminating gas for domestic or industrial purposes.

Blast furnaces consume a large proportion of the coke produced in the United States. In 1928 the consumption of coke amounted to 51,796,000 tons and, of this amount, 39,700,000 tons or 76.7 per cent, were consumed in blast furnaces. The remainder was used in foundries, in smelting the non-ferrous metals, in the manufacture of water-gas, in miscellaneous other industrial uses, and for household heating. The quantity of coke used for house heating has increased since the war period, as shown by the higher percentage of coke used in other ways than for furnace use. The production of coke in 1926 set a new record at 56,865,537 tons, due to the fact that it was in demand to meet the deficit in anthracite coal production caused by the miners' strike in that year. The decrease of 10.4 per cent shown by the 1927 figures was attributed in part to an abundant supply of anthracite in that year and particularly to the diminished activity of the blast furnaces caused by a 7.3 per cent decline as compared with 1926, in pig-iron output. The total production in 1928, 52,582,000 tons, was an increase of 2.9 per cent over 1927, with a new record for by-product coke, 48,205,577 tons, or 9.8 per cent increase over 1927.

The output of beehive coke declined from 72.5 per cent of the total coke production in the United States in 1913 to 8.3 per cent in 1928, while that of by-product coke increased from 27.5 per cent to 91.7 per cent. The decreased production in the beehive branch of the industry was due to the fact that it was assuming the position of an auxiliary which supplied only the surplus requirements of the metallurgical industry which could not be met by the by-product industry. Figures show that the output of beehive coke fell from 10,286,000 tons in 1924 to 4,376,000 tons in 1928, while the output of by-product ovens—33,934,000 tons in 1924—increased to 48,205,577 tons in 1928. The number of by-product plants devoted to the production of coke in 1913 was 36; in 1928 the number had increased to 83. Of this total, 46 were affiliated with iron furnaces and 37 were non-furnace plants, the former group producing 77.7 of the total output. Due to developments in the coke industry the allocation of certain plants was changed from "furnace" to "other" and vice versa, a change which is reflected in certain statistics

as compared with those previously published by the Department of Commerce.

The exports of coke from the United States in 1928 totaled 980,039 tons, valued at \$7,394,531, and corresponding figures for imports of coke were 131,876 tons and \$1,132,855.

PRODUCTION OF COKE IN THE UNITED STATES  
STATISTICAL AND ECONOMIC SURVEY U. S. BUREAU OF MINES

Year	Beehive	Per cent of total	By-product	Per cent of total	Total
1913	33,584,830	72.5	12,714,700	27.5	46,299,530
1914	23,335,971	67.5	11,219,943	32.5	34,555,914
1915	27,508,255	66.2	14,072,895	33.8	41,581,150
1916	35,464,224	65.0	19,072,895	35.0	54,533,585
1917	33,167,548	59.6	22,439,280	40.4	55,606,828
1918	30,480,792	54.0	25,997,580	46.0	56,478,372
1919	19,042,936	43.1	25,137,621	56.9	44,180,557
1920	20,511,092	40.0	30,833,951	60.0	51,345,043
1921	5,538,042	21.9	19,749,580	78.1	25,287,622
1922	8,573,000	23.1	28,551,000	76.9	37,124,000
1923	19,379,870	34.0	37,597,664	66.0	56,977,534
1924	10,286,037	23.2	33,934,568	76.8	44,269,605
1925	11,354,784	22.1	39,912,159	77.9	51,266,943
1926	12,488,951	22.0	44,376,586	78.0	56,865,537
1927	7,004,000	13.8	43,921,000	86.2	50,925,000
1928	4,376,000	8.3	48,206,000	91.7	52,582,000

The production of by-product coke in 1928, as stated, amounted to 48,206,000 tons, a considerable increase as against 39,912,159 tons in 1925. The relative proportions of beehive and by-product coke used have undergone a considerable change since 1913 when the beehive ovens contributed 72.5 per cent of the total, and the by-product ovens 27.5 per cent, as against an average of 8.3 per cent and 91.7 per cent, respectively, in 1928. Pennsylvania, which led in the production of beehive coke, together with Ohio produced 72.7 per cent of the total output of this product in 1928. Pennsylvania, likewise, was the leading producer of by-product coke, the output of which exceeded that of beehive coke. The output of the by-product ovens in 1928 was 13,623,000 tons. Ohio ranked second, Indiana third, Alabama fourth, and New York fifth.

A partial explanation for the marked decrease in the output of coke from 1926 was found in the fact that in that year there was a greater demand for coke to meet the deficit in anthracite, due to the miners' strike, while the supply of anthracite was abundant in 1927. The diminished activity of blast furnaces in the latter year, however, was the principal cause for a decrease, because pig-iron production then declined 7.3 per cent below the 1926 level. In 1928 it increased 4.4 over 1927. When due allowance was made for exports and imports, the estimated consumption of coke in 1927 was 51,796,276 tons, of which about 39,700,000 tons were consumed in blast furnaces, and the remainder in foundries, in smelting the non-ferrous metals, in the manufacture of water-gas, in miscellaneous other industrial uses, and for household heating. The latter item has been on the increase since the War, as indicated by the lower percentages shown for furnace use. Blast furnaces continued, however, to consume the largest proportion of coke, the percentage in 1928 being 76.6 per cent of the total consumption.

The potential coking capacity of by-product plants at the end of 1928 on the basis of 100 per cent operation under favorable conditions amounted to about 58,000,000 net tons, an increase of more than 5,000,000 tons over 1927, due to the addition of 511 new ovens. There were, in addition, approximately 100 new ovens under construction at the end of 1928 which

would bring the capacity up to 58,600,000 tons at 100 per cent operation. At this rate the plants in existence have a coal-carbonizing capacity of 82,800,000 tons of bituminous coal, which will be increased later to 84,600,000 tons through the addition of new ovens. There were 83 by-product plants producing coke in 1928, of which 46 were affiliated with iron furnaces, and 37 with non-furnace plants. The furnace plants produced 79.1 per cent of the total, and the non-furnace plants 20.9 per cent. See CHEMISTRY, APPLIED.

**COKER, WILLIAM CHAMBERS** (1872- ). An American botanist, born at Hartsville, S. C. He graduated from South Carolina College in 1894 and took postgraduate courses at Johns Hopkins University and in Germany. He taught for several years in the summer schools of the Brooklyn Institute of Arts and Sciences, at Cold Spring Harbor, L. I., and in 1902 became associate professor of botany at the University of North Carolina. He was made professor in 1907 and Kenan professor of botany in 1920. Professor Coker was a member of many scientific societies and the author of *The Plant Life of Hartsville, S. C.* (1912); *The Trees of North Carolina* (with H. R. Totten, 1916); *The Saprolegniaceae of the United States* (1921); *The Clavariaceae of the United States and Canada* (1923). Besides these, he contributed numerous articles on morphology and botany to scientific periodicals.

**COLBY, BAINBRIDGE** (1869- ). An American lawyer and statesman, born at St. Louis, Mo., and educated at Williams College and at the Columbia and New York University law schools. In 1892 he began the practice of law in New York. From 1901, when he was elected a member of the New York Assembly, he took an active interest in State and National politics, being one of the founders of the Progressive National Party. He served on numerous boards and commissions of the Government and in 1917 was a member of the American Mission to the Inter-Allied Conference in Paris. In 1920-21 he was Secretary of State in President Wilson's cabinet.

**COLBY, EVERETT** (1874- ). An American lawyer (see VOL. V). He was a member of the Republican National Committee from 1916 to 1920. In 1917 he served in the United States Food Administration, was major in the Officers' Reserve Corps in 1918, and chairman of the executive committee of the League of Nations Non-Partisan Association founded in January, 1923.

**COLBY COLLEGE.** A liberal arts college at Waterville, Me., with coördinate divisions for men and women; founded in 1813. The student enrollment increased from 440 in 1916 to 631 in the autumn of 1928, when it was divided as follows: men, 383; women, 248; and the faculty numbered 33 men and 3 women in 1928. The endowment was \$1,350,000 and the income \$259,350. The number of bound volumes in the library increased from 50,000 in 1914 to 75,000 in 1928. Recent developments included the erection of an Alumnae Health Building, providing physical education facilities for women; plans for a new gymnasium for men, for which ground was to be broken in the spring of 1929; and a new department of business administration. Arthur J. Roberts, LL.D., president since 1908, died on Oct. 11, 1927, and in the autumn of 1928 the administrative authority of the college

was vested in an executive committee of which Professor Ernest C. Marriner was chairman.

**COLE, L(EO)N J(ACOB)** (1877- ). An American zoölogist born at Allegany, N. Y. He was educated at the University of Michigan (A.B., 1901) and at Harvard (Ph.D., 1906). He was assistant in zoölogy at Michigan (1898-1902); Austin teaching fellow, Harvard (1903-06); chief of the division of animal breeding at the Rhode Island Experiment Station (1906-07); and instructor in zoölogy, Yale (1907-10). In 1910 Professor Cole went to the College of Agriculture, University of Wisconsin, where he was successively associate professor of experimental breeding (1910-14), professor (1914-18), and professor of genetics (1918- ). In 1923-24 he was on leave as chief of the animal husbandry division of the Bureau of Animal Industry, U. S. Department of Agriculture. In 1926-27 he was chairman of the division of biology and agriculture of the National Research Council.

**COLE, TIMOTHY** (1852- ). The foremost American wood engraver (see VOL. V). His latest undertaking was a series of carvings of old masters in American public and private galleries. He published with his own illustrations, *Wood Engraving: Three Essays* (Grollier Club, New York, 1916), and *The Magic Line, a Study of the Technique of Wood Engraving* (New York, 1917).

**COLEMAN, ARTHUR PHILEMON** (1852- ). Emeritus professor of geology in Toronto University (see VOL. V). He was president of the Geological Society of America in 1915 and of the Royal Society of Canada in 1921. He published, with W. A. Parks, *An Elementary Geology* (1922). Besides his reports on the economic geology of Ontario (in *Bureau of Mines Reports and Geological Survey of Canada*), he is the author of *Canadian Rockies; New and Old Trails, and Ice Ages, Recent and Ancient* (1926).

**COLES, J(ONATHAN) ACKERMAN** (1843-1925). An American physician, art collector, and philanthropist, born at Newark, N. J. He received degrees from Columbia University in arts (1864) and in medicine (1868). After continuing his studies (1877-78) in European universities and hospitals, he began to collect art objects and bestow them on institutions and cities. Among the recipients were the City of Newark, the Metropolitan Museum of Art (New York), and the universities of Columbia, Yale, Harvard, Oxford, and Cambridge. He was a co-founder of the Valley Forge Library. His purely philanthropic work comprised the building of homes at Mountainside, Union Co., N. J., for orphaned, crippled, and friendless children, and educational buildings in the Far East. He held memberships in many medical, historical, charitable, and religious organizations.

**COLETTE, kô-jët'** (1873- ). Pseudonym of a French novelist who first married Henry Gauthier-Villars, a writer using the pseudonym of Willy, and with him wrote *Claudine*, four volumes of her adventures (1900-03), under the name of Colette Willy. She then married Henri de Jouvenel (1912). She received recognition by being made a chevalier of the Legion of Honor. Her works include: *L'Ingénue libertine*; *Dialogues de bêtes*; *L'Envers du Musio Hall*; *La retraite sentimentale* (1907); *En Camarades*; *La Vagabonde*, dramatized in 1923 (1910); *L'Entrave* (1913); *La paix chez les bêtes* (1916); *Les heures longues* (1917); *Dans la foule*, essays (1918); *Mitou* (1919); *Chéri*,

dramatized in 1922 (1920): *La Chambre éclairée*; *La Maison de Claudine*; *Le Blé en herbe*; *La femme cachée*, short stories (1924), and *La fin de Chéri* (1926).

**COLGATE UNIVERSITY.** A non-sectarian institution for men at Hamilton, N. Y., founded in 1819. With the exception of the two war years, 1917-19, the University showed a steady growth for the period between 1914 and 1928, the student body increasing from 518, to 993 in the autumn of 1928; the faculty, from 47 to 84; the library, from 80,000 to 114,000 volumes; and the endowment from \$2,000,000 to \$4,160,000. A chapel and a dormitory housing 200 men were built in 1922; a new recitation hall, costing \$400,000, was completed in 1926; and Eaton Hall, formerly used by the Colgate Theological Seminary, was acquired as a dormitory to be used for freshmen, in 1928; a department of personnel and a vocational-guidance and placement bureau were established in 1927. President, George Barton Cutten, Ph.D., D.D., LL.D.

**COLLEGES.** See **UNIVERSITIES AND COLLEGES.**

**COLLENS, CHARLES** (1873- ). An American architect, born in New York City and educated at Yale University and at the Ecole des Beaux Arts in Paris. He collaborated on the plans for the buildings of the Union Theological Seminary in New York and of the Andover Theological Seminary in Cambridge, Mass.; also on those of the libraries of Ohio State University and Vassar College and of the Memorial Chapel of Williams College, as well as on the plans for the Christian Science Church in Concord, N. H., and for the Park Avenue Baptist Church, New York City.

**COLLIER, WILLIAM MILLER** (1867- ). An American diplomat (see Vol. V). He was lecturer on international law at the New York Law School until 1918. In 1915 he held the same position at Wells College, and from 1916 to 1918, he lectured on diplomacy at George Washington University, of which he was president from 1917 to 1921. In 1914 he was appointed head of the American delegation to the International Conference at Christiania, to outline a government for the Islands of Spitzbergen. He was a member of the committee on policies and platform, authorized by the Republican National Committee in 1920. In 1921 he was appointed Ambassador to Chile, a post which he resigned in 1929, after playing a leading part in the settlement of the Tacna-Arica dispute between Chile and Peru. He was the recipient of several foreign decorations, during and after the World War. He is author of: *The Law and the Higher Law* (1918); *George Washington's Will and George Washington University* (1918); *College Influences Before the War and After the War* (1920); *The Influence of Lawyers in the Past and in the Future* (in Spanish, 1921), and (with Guillermo Feliu Cruz) *La Primera Mision de los Estados Unidos en Chile* (1926).

**COLLINS, SIR WILLIAM JOB** (1859- ). A British physician and surgeon, born in London, who received his medical training at the University College Medical School there and Bartholomew's Hospital. A consulting ophthalmic surgeon to several London hospitals, he has been vice lieutenant of the County of London; vice chancellor, senator, and demonstrator of anatomy at London University; a plenipotentiary for Great Britain to the three opium con-

ferences at The Hague (1911-12, 1913, 1914); a member of Parliament (1906-10 and 1917-18), and chairman of various government boards. Besides medical works, he wrote *The Etiology of the European Conflagration* (1915); *The Ethics and Law of Drug and Alcohol Addiction* (1916); *The Life and Doctrine of Sir Edwin Chadwick* (1924). He was knighted in 1902.

**COLLINS, CHARLES WALLACE** (1879- ). An American lawyer, born at Galion, Ala., and educated at the Alabama Polytechnic Institute, the University of Chicago, and Harvard. He was admitted to the bar in 1901 and for five years practiced in Birmingham, Ala. From 1915 to 1918, he was in charge of the economic section of the legislative reference service of the Library of Congress, and the director of this section from 1918 to 1920. He assisted in drafting a bill for a national budget and in 1920-21 was law librarian of Congress, serving also as counsel of the Bureau of the Budget. He was deputy comptroller of the currency, 1923-27, and drafted the McFadden-Pepper National Bank Bill in 1924. He wrote *The National Budget System in American Finance* (1915); *The British Budget System* (1920); *The Branch Banking Question* (1926), and contributed articles on constitutional law and public finance to many law periodicals.

**COLLINS, JOSEPH** (1866- ). An American physician, neurologist, and author, who was born in Brookfield, Conn. He received the degree of M. D. from New York University in 1888 and after some years of private practice took up the specialty of neurology, becoming professor of that subject in the New York Post-Graduate Medical School. He was later a co-founder and visiting physician to the New York Neurological Institute. He has long been known as an author. His major writings, medical and secular, are *Letters to a Neurologist* (1908; second series 1910); *The Way with the Nerves* (1911); *Sleep and the Sleepless* (1912); *Neurological Clinics* (1918); *My Italian Year* (1919); *The Doctor Looks at Literature* (1923); *The Doctor Looks at Biography* (1925); *The Doctor Looks at Love and Life* (1926); *Taking the Literary Pulse*, and *The Doctor Looks at Marriage and Medicine* (1928).

**COLLINS, ROSS ALEXANDER** (1880- ). An American lawyer and public official, born at Collinsville, Mass. He was graduated from Kentucky University in 1899, and from the Law Department of the University of Mississippi in 1901. In the same year, he began practice in Meridian, Miss. He was elected attorney general of the State in 1912 and was reelected in 1915. In 1919 he was a candidate for governor in the Democratic primary. He was a member of Congress 1921-29 for the Fifth Mississippi District.

**COLLITZ, HERMANN** (1855- ). An American philologist (see Vol. V), professor of Germanic philology at Johns Hopkins, 1907-27. He was editor of *Hesperus: Schriften zur germanischen Philologie* after 1912 and author of *Sammlung der griechischen Dialektenschriften* (1884-1915).

**COLLOID CHEMISTRY.** See **CHEMISTRY.**

**COLLOIDS.** See **CHEMISTRY; BOTANY; SOIL.**

**COLOMBIA.** A South American republic situated in the northwestern part of the continent. Because of boundary disputes, its frontiers were not definitely delimited in 1929. Its area is variously estimated at from 435,000 to 440,846 square miles. The population at the

census of Mar. 5, 1918, was 5,855,077, of whom 158,428 were Indians. The population in 1912 was 5,072,604. The capital, Bogota, had 143,994. Other large cities with their populations were: Barranquilla, 64,543; Cartagena, 51,382; Medellin, 79,146; Cali, 45,525; Manizales, 43,203. In 1928 a law authorized the taking of a general census of the Republic. Preliminary figures gave to Bogota more than 220,000 inhabitants and indicated a population in excess of 100,000 each for Medellin, Barranquilla and Cali, and slightly below this number for Manizales and Cartagena. Cucuta, Pereira, and Bucaramanza, were estimated in excess of 40,000, and nearly 20,000 for Popayan.

**Industry and Trade.** Coffee is the principal crop and chief article of export, for Colombia ranked second only to Brazil as a coffee-producing country. The export totaled 334,412,920 pounds in 1927, value, \$79,808,000, that sold in the United States bringing \$65,585,000. The export in 1913 was 134,136,000 pounds. Bananas are the second important agricultural product, with exports in 1927 of 196,624,000 kilos, valued at \$5,587,000. In 1913, 157,385 tons were exported. Other important crops are rice, sugar, cotton, corn, tobacco, and wheat, while vegetable ivory, rubber, gums, medicinal plants, and dyewoods were important forest products. Gold mining, one of the oldest industries in Colombia, has been carried on since Spanish colonial days, and exports, which represented practically the entire production, were about \$5,000,000. The platinum mines, which furnished the greatest part of the world's supply, have an annual production worth some \$5,000,000. The emerald mines, controlled by the Government, are the largest producers in the world. The petroleum industry is still in its infancy but promises to be of increasing importance. Petroleum was first exported in 1926, and by the end of that year exports amounted to 5,000,000 barrels; in 1927 the exports were 13,679,000 barrels. The impetus given manufacturing during the War placed many small-scale industries in the towns on a stable footing and progress was made in the production of cotton textiles, shoes, cigarettes, beer, flour, soap, and matches. The making of Panama hats, a native industry requiring no machinery, prospered. The foreign trade of Colombia has grown steadily. The balance of trade has been favorable for many years, with the result that the Colombia peso, which is worth \$0.973, was in 1918 above par in New York, and in 1928 was a little above par. Exports in 1927 were valued at \$121,340,000, compared with \$33,457,370 in 1913; and imports for 1927 were \$118,894,000, compared with \$27,822,385 in 1913. The United States took, on the average, about 70 per cent of all exports and supplied some 47 per cent of all imports, so that it ranked first in Colombian foreign trade, with Great Britain second. Exports to the United States in 1927 amounted to \$91,800,000, compared with \$15,714,000 in 1913, while imports from the United States were \$51,481,102, compared with \$7,647,000 in 1913. The chief exports are coffee, gold, bananas, platinum, and hides; and the principal imports, textiles, foodstuffs, machinery, and construction material.

**Finance.** The Colombian national debt as of Dec. 31, 1926, was 23,768,000 pesos. This figure comprised 14,242,000 pesos of foreign debt, and 9,526,000 of internal debt. The budget for the year 1928 showed estimated revenues of 51,944,-

057 pesos, as against 12,043,145 pesos in 1912, and 45,158,061 pesos for expenditures, which amounted to 12,500,000 pesos in 1912. Total currency in circulation as of Dec. 31, 1927, was 46,370,000 pesos. During July, 1923, the Colombian government used the first \$5,000,000 installment of the American payments on the \$25,000,000 guaranteed under the 1921 treaty to establish a central bank of issue, modeled on the Federal Reserve Banks. This exerted a stabilizing effect on the finances and currency of the country. An American mission gave Colombia valuable assistance in its finances in 1923.

**Communications.** In 1927 there were 1438 miles of railway, compared with 620 in 1911. Construction work was done during 1923 on the Pacific railway, so that this line was complete to Zarzal, a distance of about 200 miles from the port of Buenaventura. In 1923 the Colombian Congress passed laws providing for the expenditure of the remaining \$20,000,000 of American payments on the construction of 11 railroads and other improvements.

**History.** Recent outstanding events in Colombia's history have centred in the settlement of the Panama question with the United States. After the failure of the treaty of 1909, a new pact was drawn up in 1914 which contained a plain apology, attributed to the Secretary of State at the time, William J. Bryan, for the American part in the Panama revolution; the agreement gave Colombian citizens the same rights as those of American citizens in the use of the Canal Zone and the Panama Canal, and it provided for the payment of a \$25,000,000 compensation in five equal annual installments. Colombia ratified the treaty, but the American Senate, incensed at its apologetic tone, withheld its consent until 1921, when, under the Republican administration, the objectionable phrases were withdrawn. On Nov. 5, 1921, the Colombian Senate accepted the treaty as revised, and on Mar. 2, 1922, the House of Representatives finally acceded, so that in the fall Colombia received its first payment of \$5,000,000. The remainder was paid in annual installments of \$5,000,000 each. This fund was devoted largely to the founding of a national bank and the promoting of various railway projects. From 1914 to 1918, José Vicente Concha served as President; and his Minister for Foreign Affairs, Marco Fidel Suárez was elected to the office for 1918-22. A decree issued by President Suárez nationalizing oil resources caused considerable excitement in business circles but was declared unconstitutional by the Supreme Court. President Suárez resigned in 1921 because of opposition encountered in the Congress, and a provisional president, Jorge Holguin, was appointed to fill out the term. For the years 1922-26, General Pedro Nel Ospina, Conservative, was elected.

In April, 1925, an attempted revolt against President Ospina by military leaders was frustrated when he unexpectedly returned to the capital from a tour of the country. In February, 1926, the Conservative Party candidate, Dr. Miguel Abadía Méndez, was chosen President without opposition and was inaugurated on August 7. His first cabinet resigned four months later, as a result of lack of confidence throughout the country in its competency. Colombia's foreign relations have been without special incident. The country remained neutral during the World War and joined the League of



votes; Smith, 133,131. W. H. Adams, Democrat, was reelected governor in 1928.

**Legislation.** The Legislature meets biennially. In 1915 a workman's-compensation law was passed. In 1917 a special session of the Legislature voted \$2,500,000 in war bonds. The Legislature in this year amended the liquor laws, passed a pure-food law, and amended the laws relating to elections. The Legislature of 1919 ratified the Federal Prohibition Amendment and reenacted the Workmen's Compensation Law amendments. In 1921 the Legislature referred to the electors an amendment prohibiting aliens from holding land in the State. Laws relating to corporations were amended and an inheritance-tax measure enacted. A special session of the Legislature, held in April, 1922, provided for the creation of an improvement district against which bonds were authorized for the construction of the Moffat Tunnel, a railway tunnel through the mountains near James Peak, northwest of Denver, on the line of the Denver & Salt Lake Railroad. A second act authorized the organization of a flood-control district along the Arkansas River for the protection of Pueblo and other communities. The Legislature of 1923 passed measures to compensate veterans of all wars, beginning with the Civil War, and to facilitate the coöperative marketing of agricultural products.

**COLORADO, UNIVERSITY OF.** A coeducational State institution at Boulder, Colo., founded in 1876. The student enrollment increased from 1236 in 1914 to 2990 in 1928-29; the faculty increased from 200 to 288 members in the same period; and the volumes in the library, from 100,000 to 183,175. There was also a summer-quarter registration in 1928 of 3437. The total income for general maintenance, from State fees, tuition, etc., was estimated at about \$1,195,000 in 1928, while approximately \$501,000, including fees, was received for operation of hospitals, and \$125,000 for new buildings. Twenty residence scholarships were established in 1922 and separate departments in journalism and anthropology were opened. The General Education Board gave \$700,000 to be used for the construction of a medical plant at Denver, and a yearly stipend of \$50,000 for its maintenance over a term of years; the Liberal Arts Buildings, the Macky Auditorium, a University Hospital and Medical School, the State Psychopathic Hospital and Nurses' Home, a chemistry building, an engineering laboratory, and other improvements, were added to the plant of the University during the period 1914-1928. In 1918 George Norlin, Ph.D., LL.D., succeeded Livingston Farrand, LL.D., as president.

**COLORADO COLLEGE.** A privately endowed, non-denominational liberal arts college for men and women, founded at Colorado Springs, Col., under the auspices of the Congregational Church in 1874. The student enrollment increased from 501 in 1914 to 679 in the academic year 1927-28, exclusive of music and art students, the net grand total for the latter year being 974. The enrollment in the summer session of 1928 was 167. The faculty during the period under review was increased from 51 to 63 members. The endowment was increased from \$1,042,000 to \$2,422,044 during the same years, and the annual income from \$85,165 to \$483,404; the number of volumes in the library, from 75,000 to 110,000 volumes. In November, 1928, the College received from E.

P. Shove, a member of the Board of Trustees since 1912, the gift of \$225,000 for the erection, equipment, and (if possible) maintenance of a collegiate chapel as a memorial to his clergyman ancestors of the past twelve generations, and the Trustees voted to undertake a campaign for \$300,000 to augment the general endowment funds. A new system of honors courses was inaugurated during the period, permitting of greater specialization and wider scope for individual investigation among the members of the two upper classes who had distinguished themselves in the first two years. A change in entrance requirements in September, 1927, provided for a greater freedom of choice in subject matter but a higher quality requirement, inasmuch as students must be in the upper two-thirds of their class in high school to qualify for admission. Charles Christopher Mierow, Ph.D., LL.D., a member of the faculty from 1916, became dean and acting president in the autumn of 1923, and was inaugurated as president on Dec. 5, 1925.

**COLOR-BLINDNESS.** TRANSMISSION OF. See HEREDITY.

**COLORED METHODISTS.** See METHODISTS, COLORED.

**COLUM, PADRAIC** (1881- ). An Irish American poet and dramatist, born at Longford, Ireland. One of the early leaders of the Irish literary renaissance, he soon gained prominence as editor of the *Irish Review* and a writer of charming lyrics. He came to the United States in 1914, where, in company with Ernest Boyd and others, he did much to familiarize Americans with the current trends in Irish literature. His later work has been largely concerned with the preparation of children's books, done with that meticulous care and poetic sense so conspicuous in all his writings. Among his books were: *Wild Earth* (1907); *Three Plays* (1916); *The Adventures of Odysseus* (1918); *The Golden Fleece* (1921); *The Anthology of Irish Poetry* (1921); *Castle Conquer* (a novel, 1923); two volumes of Hawaiian stories (1924-25); *The Road Round Ireland* (1926); *Creatures, verse*, (1927); and *The Fountain of Youth* (1927).

**COLUMBIA UNIVERSITY.** A non-sectarian institution of higher learning founded as King's College in 1754. The principal buildings are at Morningside Heights, New York City, and comprise Columbia College, a college of liberal arts for undergraduate men; schools of mines, engineering, chemistry, architecture, journalism, business, and library service; the non-professional graduate faculties of political science, philosophy, and pure science; Barnard College, for undergraduate women; Teachers College, including the departments of education and practical arts; and the university library. The College of Physicians and Surgeons, the medical school, formerly on West Fifty-ninth Street, and the School of Dental and Oral Surgery, are located on West 168th Street, at the Medical Centre, dedicated and opened in 1928. The College of Pharmacy is on West Sixty-eighth Street. Seth Low Junior College was opened in the Borough of Brooklyn in 1928. In the same year, St. Stephen's College, Annandale-on-Hudson, was incorporated in the University system. In addition to the regular sessions, there is a thorough system of university extension and home study, and in the summer, besides the regular summer session at Morningside Heights, a summer camp at Morris, Conn. Extramural

## COLUMBIA UNIVERSITY



*Underwood & Underwood*

### MEDICAL CENTRE, NEW YORK

To the right is the twenty-two story Presbyterian Hospital building which houses also Sloane Hospital for Women and Squier Clinic. The lower building in the right foreground is the Stephen V. Harkness Pavilion for private patients. The Babies' Hospital appears to the extreme right of the Presbyterian Hospital. The Columbia University College of Physicians and Surgeons is the high building in the background adjoining the Presbyterian. In the centre foreground is Anna G. Maxwell Hall, the residence for the Presbyterian Hospital School of Nursing. The large building to the left is the New York State Psychiatric Institute and Hospital. The Neurological Institute is between the New York State Psychiatric Institute and Maxwell Hall.



work in many subjects is conducted in various centres near New York.

The enrollment of the university grew steadily from 14,098 resident students in 1913 to 36,398 on Mar. 2, 1929 including 14,007 in the summer session of 1928, but excluding duplicates: and the number of members of the faculties was increased from 907 in the earlier year to 2714 in 1928. The library was increased during this period from 550,000 bound volumes and 75,000 German dissertations to 1,132,236 volumes. In 1928 the total endowment amounted to \$69,550,071.31 and the estimated total resources of the university, \$124,415,474.10. The annual budget for the academic year 1928-29 was set at \$13,829,105.94. An elaborate building programme was laid out in 1919, since which year to the physical equipment of the university have been added Johnson Hall, a residence for women graduate students, Russell Hall, the library and administration building for Teachers College, Hewitt Hall, a residence for undergraduate women of Barnard College, completely equipped modern physics laboratories, the Chandler Laboratories for advanced instruction and research in chemistry, John Jay Hall, a residence and dining hall for undergraduate men containing also headquarters for student activities, new buildings for the College of Physicians and Surgeons and for the School of Dental and Oral Hygiene as units in the Medical Centre, established on West 168th Street in conjunction with the Presbyterian Hospital, and the Casa Italiana, a centre of Italian culture. The University acquired a tract of more than twenty-eight acres at the northern end of Manhattan Island for an athletic field known as Baker Field, in honor of its donor, George F. Baker. Various apartment houses in the vicinity of the university for the use of officers and teachers were purchased in this period. Early in 1929, a parcel of real estate comprising almost three solid city blocks between Fifth and Sixth avenues and extending from Forty-eighth to Fifty-first streets, held at a nominal value when acquired by the university in 1814, was leased for a period of eighty-seven years at a rental reported to be approximately \$3,000,000 annually. This transaction was held to be one of the largest of its kind ever consummated in New York City and by its terms the university secured a considerable addition to its annual income.

In 1918 women were admitted as students to the medical school for the first time and in 1927, to the Law School. In 1923 the College of Dental and Oral Surgery of New York was merged with the School of Dentistry, established in 1917, and the school thus formed, known as the School of Dental and Oral Surgery of Columbia University, was moved to the Medical Centre on West 168th Street in 1928. Lincoln School was established in 1917 under the direction of Teachers College, for the purpose of scientific experimentation and constructive work in the reorganization of elementary and secondary education. In 1910 selective tests were instituted which may be substituted for entrance examinations for Columbia College, and this system has since been modified and extended for use in other schools of the university. In 1927-28 the entire curricula of the undergraduate colleges for men and women were revised so as to present to the student of today a programme truly educational in character, based upon the largest experience and the best wisdom and adapted to various

modern needs. Home-study courses carrying no academic credit were instituted in 1919 under the department of university extension. The School of Library Service, with which are absorbed and combined the former New York State Library School of Albany, New York, and the Library School maintained by the New York Public Library, was opened in 1926, thereby carrying to final consummation a plan first entered upon by the university in 1883. In co-operation with the University of Porto Rico, Columbia, in 1926, established and undertook to maintain the School of Tropical Medicine at San Juan, Porto Rico. In 1928 Seth Low Junior College was established in the Borough of Brooklyn as a development of the work of university extension and named in honor of a former Mayor of both Brooklyn and New York and a former president of the university as well; St. Stephen's College, Annandale-on-Hudson, New York, became a member of the university's educational system; and an agreement was entered into with the Union Theological Seminary by the terms of which the faculty of the Seminary becomes in effect the faculty of theology in the university's educational system. In the same year, the trustees voted an increased schedule of salaries making the minimum salary for full professorship \$7500, the increases applying to all grades of academic appointment.

The faculty of law completed in 1923 a plan for the organization of advanced instruction and research in the field of public and private law and the degree of doctor of law (Doctor Juris) to be conferred on practically the same terms as the degree of doctor of philosophy in other fields of knowledge, was established. In 1928 there was created a new academic status, that of Emeritus Professor in Residence, by the terms of which a professor of distinction may continue a limited programme of instruction and research after reaching the retiring age. President, Nicholas Murray Butler, LL.D. (Cantab.), D.Litt. (Oxon), Jur.D. (Paris). See BARNARD COLLEGE.

**COLUMBIAN SQUIRES.** See KNIGHTS OF COLUMBUS.

**COLUMBUS.** The capital of Ohio. The area of the city was increased from 14,570.2 to 15,824.5 acres by the annexation of Linden Heights Village in 1921. The population increased from 181,511 in 1910 to 237,031 in 1920, and to 299,000 in 1928, by the estimate of the Bureau of the Census. A municipal charter of the home-rule type went into effect in 1916. Since 1920 a city-planning commission has carried on an active programme, its membership consisting of the city engineer and director of public safety and various citizens, including a professor of municipal engineering, a real estate man, an architect, and a newspaper publisher.

Plans for the establishment of an elaborate civic centre along the Scioto River have resulted in the erection of a number of public buildings, including the City Hall, American Insurance Union citadel, and a high school costing \$1,000,000. Another reservoir, capable of containing 5,833,000,000 gallons, has been built, and the purification and pumping works have been enlarged. The cost of this was met by a \$3,000,000 bond issue voted in 1919. In 1921 three concrete arch bridges were opened to traffic to replace the bridges lost in the great flood of 1913. The Mound Street Bridge, 1050 feet long and supported by nine arches, was built by the

city at a cost of \$6,000,000; the others at Broad Street and at Town Street were built by Franklin County at a cost of \$600,000 apiece. An elaborate passenger air station was constructed at the Municipal Airport in 1929.

The assessed valuation of property in Columbus in 1927 was \$594,323,000; the net indebtedness was \$27,220,000. Nearly \$6,000,000 has been expended on a school-building programme. The value of manufacturing increased from \$70,000,000 in 1914 to \$178,289,061 in 1925. From 1925 to 1927, there was extensive construction of apartment houses, office and theatre buildings, factories and warehouses.

**COLVIN, kōl'vīn, SIR SIDNEY (1845-1927).** An English art and book critic (see VOL. V). Besides being a member of numerous learned and art societies, he was author of *John Keats, His Life and Poetry* (1917), and *Memories and Notes* (1921). Consult *The Colvins and Their Friends*, by E. V. Lucas (1928).

**COMBES, kōnb, (JUSTIN LOUIS) ÉMILE (1835-1921).** A French statesman (see VOL. V), who was a member, without portfolio, of the Briand ministry of 1915-16.

**COMBINING WEIGHTS.** See **CHEMISTRY.**

**COMETS.** See **ASTRONOMY; PHYSICS.**

**COMFORT, WILL LEVINGTON (1878- ).** An American novelist, born at Kalamazoo, Mich., and educated in the public schools of Detroit. He served in the United States Cavalry during the Spanish-American War, and was war correspondent in the Philippines and China in 1899 and in Japan and Russia in 1904. Besides numerous contributions to periodicals, he wrote the following: *Rouledge Rides Alone* (1910); *Fate Knocks at the Door* (1912); *Down Among Men* (1913); *Midstream* (1914); *Red Fleece* (1915); *Lot & Company* (1915); *Child and Country* (1916); *The Hive* (1918); *The Shielding Wing* (1918); *Son of Power* (1920); *This Man's World* (1921); *The Public Square* (1923); *Somewhere South in Sonora* (1925); and *Samadhi* (1927).

**COMMISSION AND COMMISSION-MANAGER PLAN OF CITY GOVERNMENT.** See **MUNICIPAL GOVERNMENT.**

**COMMISSION FOR RELIEF IN BELGIUM.** See **BELGIUM.**

**COMMON PRAYER, BOOK OF.** See **ENGLAND, CHURCH OF.**

**COMMONWEALTH FUND.** See **UNIVERSITIES AND COLLEGES.**

**COMMUNISM.** As the type of socialist doctrine which, on the basis of the Marxian Communist Manifesto, strives for the attainment of the socialist aim by means of the dictatorship of the proletariat, communism is a recent development and quite different from the earlier interpretation. While the communists believe, like the socialists, in collective ownership of the means of production, they are unalterably opposed to any temporizing and to any coöperation toward this end with the bourgeois parties. The communists believe that the revolutionary working classes must seize the power and set up a dictatorship of the proletariat in preparation for the socialist state. This does not mean, however, that the communists reject democracy as such, but they hold that, during the period of transition, until the socialist state is achieved, majority rule is unfeasible and the struggle must be carried on by a class-conscious minority.

Modern communism is distinctly a fruit of the Russian Bolshevik Revolution of November,

1917. Previous to the War, two socialist groups, differing in aim and procedure, existed in Russia. The first group, the Revolutionary Socialists, regarded Russia as an agricultural country whose economic development must necessarily be different from that of western Europe. The second group, the Social Democratic Party, stood squarely on the basis of the Marxian doctrine of the class struggle and held that Russia must first go through the industrial and capitalistic stage in order to attain the socialist ideal. It was this group, or rather its majority element, the Bolsheviks, who through their majorities in the Workmen's and Soldiers' Councils seized the power in Russia in November, 1917, organized the communist state, and elaborated the communist doctrine. They set up a dictatorship of the proletariat—that is, of the communists—and suppressed all elements opposed to their rule. They had no illusions as to the advisability of applying their principles of liberty and democracy to existing conditions. In their opinion, Russia was in a state of transition during which all opposition had to be wiped out ruthlessly and preparations had to be made to bring about the socialist state. The executive power of the Russian communist state was in the hands of the Board of People's Commissaries, which derived its authority from the All-Russian Congress of Soviets, the members of which were communists, with very few exceptions. The Communist Party in Russia, which wielded absolute power, seldom exceeded a membership of 700,000. It was the agency through which the Government kept in contact with the trade unions and all other organizations.

Under the auspices of the Soviet government, the Third or Communist International was organized in March, 1919, at Moscow. It was headed by Gregory Zinovieff, who was responsible for a persistent propaganda being carried on in Great Britain, Germany, and France. The so-called Zinovieff letters played a prominent part in the British election campaign of 1924 and helped in the defeat of the Labor government. Zinovieff resigned in October, 1926, his decline being synonymous with the ousting of Trotsky and Kameneff from the political bureau of the Russian Communist Party. He was succeeded by Bucharin, under whom the international activities of the party were permitted to languish as a result of the opportunist tactics of the Stalinists. Bucharin, too, resigned in March, 1929, and appeared to ally himself with the Trotskyists, who by this time included such other brilliant party leaders as Radek, Rakowski, Smilga, etc. The peak of the Third International was reached at the fifth congress of the body, when 500 delegates from 60 countries assembled in Moscow (1924).

The radical dissenting elements of the American Socialist Party established the American Communist Party in September, 1919. A day later, the Communist Labor Party was founded by John Reed. The differences between the two groups were slight and a section of the Communist Party united in 1920 with the Communist Labor Party to form the United Communist Party. The American Government took strong action against the communists and the result was that the movement was driven underground. The Workers' Party was formed in December, 1921, but was compelled to exist secretly as a result of the attitude of the Federal and State governments. In the national election of 1924,



the Workers' Party polled 36,386 votes. The Workers' Party, in the election of 1928, nominated William Z. Foster and Benjamin Gitlow and issued a manifesto in which it called for the establishment of a workers' and farmers' government and a communist society in which the "means of production will not be the property of the few." Its candidates received 48,228 votes. In certain trade unions, the communists played significant rôles, their struggle with the Rights succeeding in disrupting the ladies' dress and fur industries in New York City, for example. Toward the close of the period under review, communists in trade unions gave up their tactics of boring from within and formed parallel unions; thus sapping the strength of the conservative trade-union organizations. In 1929 the party's internal organization was split asunder by the Stalin-Trotsky conflict. In France, Germany, and, to a lesser extent, in Great Britain, the communist groups were active. See RUSSIA; SOCIALISM.

**COMMUNITY CHESTS.** See CHARITIES.

**COMMUNITY DRAMA.** See EDUCATION IN THE UNITED STATES.

**COMMUNITY MUSIC.** See MUSIC.

**COMPANIONATE MARRIAGE.** See DIVORCE.

**COMPANY.** See ARMIES AND ARMY ORGANIZATION.

**COMPASS, EARTH INDUCTION.** See NAVIGATION.

**COMPASS, RADIO.** See NAVIGATION.

**COMPIEGNE, OFFENSIVE AGAINST.** See WORLD WAR.

**COMPLEX, IDEA OF.** See PSYCHOLOGY, ABNORMAL.

**COMSTOCK, ADA LOUISE (1876- ).** An American educator and college president, born in Moorhead, Minn. She studied at the University of Pennsylvania and Smith College and took postgraduate courses at Columbia, Mt. Holyoke, and the University of Michigan. She served on the faculty of the University of Minnesota as professor and dean of women until 1912, when she was appointed dean of Smith College. After eleven years there, she became president of Radcliffe College (1923). In 1928 President Hoover appointed her as the only woman member of his National Law Enforcement Commission.

**COMSTOCK, F. RAY (1880- ).** An American theatrical producer born in Buffalo, N. Y., who began as a producer for the theatre in 1900 and has been best known for his productions of *Very Good, Eddie*; *Oh, Boy!*; *Oh, Lady, Lady*; *Oh, My Dear*; *Chu Chin Chow*; and *Mecca*. He brought to the United States Balieff's *Ochavoe-Souris* and presented Madame Eleanor Duse for her last American tour.

**COMSTOCK, HARRIET THERESA (1860- ).** An American author, born at Nichols, N. Y. She was educated at an academy in Plainfield, N. J. In 1885 she was married to Philip Comstock, of Brooklyn. Her books, mostly for children, had a very wide sale. They include: *Molly, the Drummer Boy* (1900); *A Boy of a Thousand Years Ago* (1902); *Janet of the Dunes* (novel; 1908); *Joyce of the North Woods* (1911); *A Son of the Hills* (1913); *The Place Beyond the Winds* (1914); *The Vindication* (1917); *Mam'selle Jo: A Novel of the St. Lawrence Country* (1918); *Unbroken Lines* (1919); *The Shield of Silence* (1921); *At the Crossroads* (1922) and *The Tenth Woman* (1923).

**CONANT, JAMES BRYANT (1893- ).** An American chemist, born at Boston, Mass., and educated at Roxbury Latin School and Harvard (A.B., 1914; Ph.D., 1916). After a year as instructor in chemistry at Harvard, he became a major in the research division of the Chemical Warfare Service during the World War. Returning to Harvard in 1919, he was successively assistant professor, associate professor, and professor of chemistry (1919-29). In 1929 he became Sheldon Emery Professor of organic chemistry. In the same year, he was elected to the National Academy of Sciences. He is the author of *Organic Chemistry* (1928).

**CONCRETE.** See CEMENT; ROADS AND PAVEMENTS.

**CONE, HUTCHINSON INGHAM (1871- ).** An American naval officer (see Vol. V). He commanded the United States Naval Aviation Forces from August, 1917, to October, 1918, and was wounded when his ship was sunk in the Irish Sea by a German submarine in 1918. He received many foreign decorations and the Distinguished Service Medal of the United States Navy. He was retired in 1922. He served as general manager of the U. S. Shipping Board Emergency Fleet Corporation (resigned 1925).

**CONFLAGRATIONS.** See FIRE PROTECTION.

**CONGER, SEYMOUR BEACH (1876- ).** An American newspaper writer, born at Port Huron, Mich. He graduated from the University of Michigan in 1900, served on the staff of several papers in Michigan and after 1903 served the Associated Press as correspondent in St. Petersburg during the revolution of 1905 and the Russo-Japanese War, director of the Berlin bureau from 1910 to 1917, and war correspondent with the German and Austro-Hungarian forces until the United States entered the World War. He represented the Associated Press at the Peace Conference at Paris. In 1918 he was foreign adviser to the War Trade Board in Washington, and acted as chief correspondent of the *Public Ledger*, Philadelphia, in central and eastern Europe, 1920-25. During the Spanish-American War, he served as private in the 32d Michigan Infantry.

**CONGO, BELGIAN.** A Belgian colony of central Africa, with an estimated area in 1928 of 918,000 square miles, and a native population estimated at 8,500,000 to 11,000,000. The white population on Jan. 1, 1927, numbered 18,169. Of the population of 1927, 11,898 were Belgians; 844, English; 443, Americans; 1368, Portuguese; and 981, Italians. The leading cities were Boma, the capital, Matadi, Banana, Leopoldville, Stanley Pool, and Elizabethville.

**Industry and Trade.** The rubber industry has steadily dropped in importance. In 1926 only 1,128,818 kilos were exported, as compared with 3,401,970 kilos in 1911. On the other hand, the palm-oil industry, exploited by British capital, has made steady advances, so that by 1926 the export of palm nuts was 70,424,630 kilos (5,573,630 in 1910), and of palm oil, 18,447,270 kilos (1,963,637 in 1910). With the fall in rubber, attention was turned to the cultivation of cotton, cocoa, rice, and copal, whose export in 1911 amounted to 1,944,455 kilos. In 1926 this export amounted to 20,866,410 kilos. The development of the copper mines, too, increased enormously under the British penetration into Katanga. (See COPPER). Furnaces were built

for the smelting of the ore for shipment to the United Kingdom. In 1911 the shipment was about 909,090 kilos; by 1926 it had reached 78,983,310. Gold, diamonds, and ivory are other important products. Exports, both general and special, were valued at 142,590,000 francs in 1912; in 1926 they were valued at 729,301,977 francs. Copper, palm nuts, and oil were particularly important. Belgium, of course, absorbed most of the trade. Leading imports were cotton, provisions, machinery, spirits, ships, and arms. Imports in 1913 were worth 71,590,781 francs; in 1926, 1,293,197,242 francs. The United States imports were put at 76,451,822 francs, a tremendous increase over the 74,525 francs of 1913. By Jan. 1, 1927, the total length of railways had increased to 1623 miles. The most important project begun in 1921 was a line from Chilongo in the Katanga to Angola, 400 miles, to be linked eventually with the line to Lobito Bay on the Atlantic Ocean. This would give the Katanga mines direct connection with European markets. In 1911 a pipe line was laid from Matadi to Leopoldville for the purpose of transporting crude oil for the use of river steamers. In 1927 there were 2167 miles of telegraph line, about twice as much as in 1912 (1145 miles), and 17 wireless stations (5 in 1912).

**Finance.** The 1928 budget provided for receipts of 521,563,585 francs, against 40,418,100 for 1913; 1928 expenditures were placed at 521,241,955 francs, against 50,933,064 for 1913. The public debt in 1928 was 1,893,050,983 francs. Expenditures usually exceed receipts, with the result that the deficit steadily mounts and loans have to be made for its service.

**History.** Natives were employed in the fighting in East Africa and aided in the subjection of German East Africa. At the conclusion of the War, Belgium was given the districts of Ruanda and Urundi, formerly belonging to German East Africa, and the territory around Lake Kivu necessary to make it Belgian. All in all, 19,000 square miles were added to the Congo's territory. To facilitate the construction of the Cape to Cairo railway and more particularly a line from the Tanganyika Territory to Uganda, Belgium turned over to Great Britain portions of this new territory.

**CONGREGATIONALISM.** Congregationalism traces its origin to the Separatist and Puritan developments of the Reformation in England. Its policy represents adaptation to conditions rather than accord to a theory of church government. The local church is the unit and every church member has an equal voice in its conduct and is equally subject to its control. The membership increased from 750,193 in 1914 to 928,558 on Jan. 1, 1928, and the number of Sunday-school pupils from 701,460 to 742,270; the number of churches, on the other hand, decreased from 6006 to 5548 and the number of ministers from 6066 to 5609. In October, 1923, the National Council, the representative body of the denomination, approved the proposals of the Interchurch Conference on Organic Union, that as soon as at least six denominations agreed, they should merge under the name of the United Churches of Christ in America. The plan grew out of overtures made by the General Assembly of the Presbyterian Church in the United States of America in 1918 and was referred in 1921 to State conferences and district associations for action. The National Council

in 1923 also expressed its willingness to confer with the Presbyterian Church with a view to merging. In 1929 the National Council meeting at Detroit voted for an organic union with the Christian Church. A five-year tercentenary campaign in celebration of the anniversary of the landing of the Pilgrim Fathers was carried on in 1915-20, one item of which was the subscribing of \$5,000,000 as an endowment of a pension system for ministers, and in June, 1928, a group of 1200 Congregationalists from England made a pilgrimage to Boston and Plymouth Rock and visited Providence, New Bedford, and other New England cities, as well as New York and Brooklyn, before their return to England. On Jan. 1, 1928, the denomination was maintaining 17 missions under 12 flags, 98 stations in connection with these missions and 1,665 outstations. Statistics of the American Missionary Association showed 236 churches with 11,254 members, and 32 schools with 7,472 pupils. The denomination had affiliations with 10 theological seminaries and 41 colleges, although some of the latter were undenominational.

**CONGREGATIONAL METHODISTS.** This branch of the Methodist Church was organized in Georgia in 1872 as a protest against certain features of the episcopacy and the itinerancy, and for the purpose of securing a more democratic form of church government. In 1881 a small group of Southern churches divided from the main body to form the New Congregational Methodist Church; by 1928 they had 25 churches, with 1229 members. The churches of the Congregational Methodists in 1916 numbered 197, with a membership of 12,503, and 250 ministers. The denomination in 1928 had 145 churches, with 9691 members, and 125 ministers. The total enrollment of the 80 Sunday schools was 4807.

**CONKLING, GRACE WALCOTT HAZARD** (?- ). American author, born in New York City and educated at Smith College and in Europe. In 1914 she went to Smith to teach English, becoming associate professor. Her collected volumes of verse included *Afternoons of April* (1915); *Wilderness Songs* (1920); *Ship's Log and Other Poems* (1924); and *Flying Fish—a Book of Songs and Sonnets* (1926). In the period she attracted wide attention as the teacher of her little daughter, Hilda Conkling, whose *Poems by a Little Girl* (1920) displayed great ability.

**CONNAUGHT, kōn'nāt, ARTHUR WILLIAM PATRICK ALBERT, DUKE OF** (1850- ). English statesman (see VOL. V). In 1916 he retired from his position as Governor General of Canada, and in 1920 went to India to represent the King of England in the inauguration of the legislative councils of Madras, Bengal, and Bombay. His only son, Prince Arthur of Connaught, who was educated for the British Army and served at the front during the World War, was Governor General of the Union of South Africa, 1920-23.

**CONNECTICUT.** The forty-sixth State of the United States in size (4965 square miles) and the twenty-ninth in population; capital, Hartford. The population of the State increased from 1,114,756 in 1910 to 1,380,631 in 1920, or by 23.9 per cent; estimated population, 1928, 1,667,000. The white population increased from 1,098,897 (1910) to 1,358,732 (1920); Negro, from 15,174 to 21,046; native white, from 770,138 to 982,219; foreign-born white, from 328,759 to 376,513; The urban population rose from

731,797 in 1910 to 936,339 in 1920; the rural, from 382,959 to 444,292. The growth of the principal cities was New Haven (q.v.), 133,605 to 162,537; Bridgeport (q.v.), 102,054 to 143,555; Hartford (q.v.), 98,915 to 138,036.

**Agriculture.** While the population of the State has increased by reason of large urban growth, the percentage of rural population declined from 40.1 in 1900 and 34.4 in 1910, to 32.2 in 1920. Thereafter, the total area in farms decreased slightly from 1,898,980 acres in 1920 to 1,832,110 in 1925; the number of farms, however, rose slightly from 22,655 to 23,440; the improved land in farms was 701,086 acres in 1920. The total value of farm property which had increased from \$159,399,771 in 1910 to \$226,991,617 in 1920 rose somewhat further to \$230,828,891 in 1925, but the average value per farm, having risen from \$5944 in 1910 to \$10,019 in 1920, fell to \$9032 in 1925. In interpreting these and all other comparative values for the period covered, the nationwide inflation and deflation of prices must be considered. The total percentage of land in Connecticut used for agricultural purposes in 1920 was 61.0, and decreased to 59.4 in 1925. The percentage of improved land in farms decreased from 32 to 22.7 between 1910 and 1920. Of the 22,655 farmers of 1920, 14,955 were native white, as compared with 19,841 in 1910; foreign-born white, 7625, as compared with 6861; colored, 75, as compared with 113. Of the total number of farms, 23,240 in 1925, 21,258 were operated by their owners, as compared with 19,666 in 1920; managers operated 1070 farms in 1920 and 494 in 1925; tenants operated 1919 farms in 1920, 1488 in 1925. Farms reported by operator owners as mortgaged numbered 8920 in 1920, and 9197 in 1925. The number of all cattle on farms in 1920 was 173,764; in 1925, 152,864. The number of sheep decreased from 10,842 to 6941. Tobacco growing underwent an extensive and fairly continuous decline for several years after 1920. The estimated production of the chief farm crops in 1927 was as follows: corn, 2,090,000 bushels; oats, 480,000; potatoes, 1,635,000 bushels; hay, 538,000 tons; and tobacco, 28,886,000 pounds. Comparative figures for 1913 are corn, 2,348,000 bushels; oats, 308,000; potatoes, 2,203,000 bushels; hay, 432,000 tons; and tobacco, 28,520,000 pounds.

**Mining.** Connecticut is not an important mineral-producing State, and its mineral products in the decade were chiefly nonmetallic. In order of importance, they were clay products, stone, lime, sand, and gravel. The value of the clay products was \$1,229,037 in 1914; in 1920, \$3,255,295; and in 1921, \$1,703,528. In 1926 the year's output of clay products was \$3,291,298. The annual value of the stone production was approximately \$2,500,000. The total value of the mineral products of the State was \$3,023,192 in 1914; \$6,326,326 in 1920; \$4,219,457 in 1921; \$7,695,341 in 1926.

**Manufactures.** Connecticut is one of the most important manufacturing States. In 1920, 18 of its cities had more than 10,000 inhabitants, with a combined population of 865,943, or 62.7 per cent of the population of the State. In 1919, 71 per cent of the value of the State's manufactured products was reported from these cities. The number of manufacturing establishments in 1927 was 2877; in 1914, 4104; in 1919, 4872; and in 1925, 3062. Wage earners engaged in manufactories numbered: 1927, 240,-

806; 1914, 226,264; 1919, 292,672; 1925, 242,362. The capital invested in 1914 was \$620,194,294, and in 1919, \$1,232,324,318. The value of the products was \$1,284,738,563 for 1927; \$545,471,517 for 1914; \$1,392,431,620 for 1919; and \$1,271,932,562 for 1925; the increase from 1914 to 1919 was largely due to changes in industrial conditions brought about by the World War, and cannot properly be used to measure the normal growth of manufactures during the period. The increase in the number of wage earners indicates a decided growth of the manufacturing activities of the State. Foundry and machine-shop products rank high in their value which in 1925 was \$83,721,957; in 1914, \$67,009,000; and in 1919, \$203,626,000. Industries relating to the manufacture of brass, bronze, and copper products rose to first place, with products valued at \$156,141,974 in 1925; in 1914, \$69,353,000, and in 1919, \$169,550,000. In the manufacture of textiles, Connecticut is one of the most important States; in recent years, it ranked first in the fur-felt hat industry, fourth in silk, sixth in manufactured cotton, and sixth in the combined woolen and worsted-goods industry. The value of cotton-goods production in 1909 was \$24,232,000; in 1914, \$30,809,000; and in 1919, \$105,054,000. The silk-goods production was valued at \$21,063,000 in 1909; \$30,592,000 in 1914; and \$68,053,000 in 1919. The value of woolen products fell from \$19,363,228 in 1909 to \$17,128,975 in 1914; in 1919 it had risen to \$53,814,059. The most important manufacturing cities in the State are Bridgeport, Hartford, New Britain, New Haven, and Waterbury. Bridgeport had 367 establishments in 1909; 405 in 1914; and 443 in 1919; with products valued at \$85,126,000 for 1914; \$208,090,000 for 1919; and \$149,098,000 for 1925. In Waterbury, 169 establishments in 1909, 190 in 1914, and 253 in 1919, had products valued at \$50,350,000, \$50,659,000, and \$130,193,000, respectively. New Haven had 588 establishments in 1909, 538 in 1914, and 769 in 1919; the production attained the value of \$57,752,000 in 1914; \$125,456,000 in 1919; and \$110,506,000 in 1925. In Hartford, which had 396 establishments in 1909, 380 in 1914, and 504 in 1919, the value of local products was \$42,831,000 in 1914, \$118,003,000 in 1919, and \$109,678,000 in 1925. New Britain counted 111 establishments in 1909, with products valued at \$22,021,000; 1914, 120, with \$23,227,000; and in 1919, 116, with \$63,622,000. Other important manufacturing cities are Ansonia, Bristol, Danbury, Meriden, Middletown, New London, Norwalk, Torrington, Stamford, and Willimantic.

**Education.** Legislation in 1913 provided for the codification of the school laws and for vocational guidance in schools. In 1917 an agreement was made under the Smith-Hughes Act, for Federal assistance in vocational education. A measure passed in 1921 provided for a division of physical education and health; another bill created a division of special educational standards. In 1923 provision was made for State aid for the transportation of elementary school pupils and for the penalizing of any town which unduly delays in providing adequate school facilities. The department of Americanization, established in 1919, was changed to the Division of Adult Education. The enrollment in the public schools in 1925-26 was 320,463; the average attendance, 265,807; the enrollment had

been, in 1921-22, 279,043 and attendance 229,689. Enrollment in the elementary schools was 279,106 in 1925-26, and in high schools, 41,357. The total expenditure for public day schools in 1925-26 was: current, \$24,988,651; outlays, \$7,777,076. The percentage of illiteracy in the State increased from 7.2 per cent in 1910 to 7.8 per cent in 1920. Among those of native white parentage, it decreased from 0.8 per cent in 1910 to 0.4 per cent in 1920, and among the Negroes, from 7.8 to 7.5 per cent. Among foreign-born whites, it increased from 16 to 18.1 per cent.

**Finance.** State expenditures in the year ending June 30, 1927, as reported by the U. S. Department of Commerce, were: for maintenance and operation of governmental departments, \$20,100,613 (of which \$1,581,491 was for local education); for running public-service enterprises, \$81,800; for interest on debt, \$656,865; for permanent improvements, \$9,050,580; total, \$29,880,918 (of which \$11,891,370 was for highways, \$4,101,020 being for maintenance and \$7,790,350 for construction). Revenues were \$32,658,116. Of these, property and special taxes formed 25.2 per cent; departmental earnings and remuneration for officers' services, 9.3 per cent; license sales and gasoline taxation, 54.0 per cent. Property valuation was \$2,554,603,534; State taxes thereon were \$1,812,953. Net State funded debt on June 30, 1927, was \$3,078,148.

**Political and Other Events.** In 1914 Marcus H. Holcomb, Republican, was elected governor. Senator Brandegee was reelected over Gov. Simon E. Baldwin. Governor Holcomb was reelected in 1916, and George P. McLean was reelected senator. In the presidential election in 1916, Charles E. Hughes received 106,514 votes; President Wilson, 99,786 votes. In 1917 and the years following, the great industrial cities of the State prospered because of activities following the entrance of the United States into the War. Manufactories were made over for war uses and others built. At the end of 1917, the State had about 9000 men in camp under the selective draft law and about 4000 volunteers. In 1918 Governor Holcomb was again elected. The total number of men drafted in the Federal service, 1917-18, was 23,533, with a total of 54,123 in the Army and Navy for the State. In 1920 Everett J. Lake was elected governor, and Senator Brandegee was reelected. For President, the State gave Warren G. Harding 229,238 votes and James M. Cox 120,721. In 1922 Charles A. Templeton, Republican, was elected governor and Senator McLean was reelected. In the presidential election of 1924, the State voted: Coolidge, 246,322; Davis, 110,184; LaFollette, 42,416. Professor Hiram Bingham of Yale, Republican, was elected governor, but resigned office in 1925 after serving one day, having been made Senator in the meantime by special election following the death of Brandegee. In 1925 were created the State Water Commission and the Commissioner of Aviation. John H. Trumbull, lieutenant governor, succeeded Governor Bingham, and was reelected in 1926. A Board of Finance and Control was created in 1927 to correlate State expenditure and budget making. Hoover, for President, received 296,614 votes in 1928; Smith, 252,040.

**Legislation.** In 1915 the budget system was adopted and the State's financial policy revamped to provide a pay-as-you-go policy. In

1915 the Woman Suffrage Amendment was rejected by the Legislature, but the State after steadfastly opposing it, suddenly ratified in 1920, when doubt about Tennessee's ratification seemed likely to threaten the validity of the forthcoming presidential election. Demand for a soldiers' bonus resulted in the establishment of a \$2,500,000 State fund, the income to be paid to an ex-service men's organization, for the aid of needy veterans or their dependents. In 1921 a child-welfare bureau and a juvenile-court system were established; a uniform system of accounting for all State departments and institutions was set up, and persons accused of crimes received option whether to be tried by the court or by jury. In 1923 the Legislature passed a bill to facilitate coöperative marketing of agricultural products and amendments were made to the income-tax laws. A constitutional amendment adopted in 1924 allowed the governor to veto single items in appropriation bills.

**CONNELLEY, WILLIAM ELSEY** (1855- ). An American author (see VOL. V). His recent works include *History of Kansas* (5 vols., 1917), and *History of Kentucky* (5 vols., 1922).

**CONNELLY, MARC** (MARCUS COOK) (1890- ). An American playwright born at McKeesport, Pa. He began his writing as a reporter for the *Pittsburg Sun*. He has contributed verse and articles to *Life*, *Everybody's*, and other magazines and has written lyrics for several musical comedies including: *Dulcy*; *To the Ladies*; *Little Old Millersville* (in collaboration with G. S. Kaufmann, 1921-22); *The Beggar on Horseback* (with Kaufmann, 1923), founded on P. Appel's *Hans Sonnenstössers Höllenfahrt*; and *The Butter and Egg Man* (1926).

**CONNOR, RALPH.** See GORDON, CHARLES WILLIAM.

**CONNOR, WILLIAM DURWARD** (1874- ). An American soldier, born at Beloit, Wis. Graduated from the United State Military Academy in 1897, he rose through the ranks from second lieutenant to major general (1925). He served in the Philippines in 1898 and for several years following was engaged in engineering capacities, serving also with the General Staff from 1912 to 1916. In 1917 he served with the A. E. F. as assistant chief of staff. He was appointed chief of staff of the 32d Division in 1918, and in the same year commanded the 63d Infantry Brigade of that division. In 1918-19 he was chief of staff of the Service of Supply, and was commanding general of the American forces in France to Jan. 7, 1919. In 1921 he was chief of the Transportation Service and in the same year acted as assistant chief of staff. He received decorations and honors from the British and French governments. He commanded the U. S. Army forces in China, 1923-26. In 1926-27 he commanded the 2d Division. Since 1927 he has been commandant of the Army War College at Washington, D. C.

**CONRAD, JOSEPH** (1857-1924). An English novelist (see VOL. V). In 1924 he made a visit to the United States. The later works by Conrad include *Within the Tides* (1915); *Victory* (1915); *The Shadow-Line* (1917); *The Arrow of Gold* (1919); *Rescue* (1920); *Notes on Life and Letters* (1921); *The Rover* (1923); *Under Western Eyes* (1923); *The Shorter Tales of Joseph Conrad* (1924); *Suspense* (an unfinished novel, 1925); *Last Days* (1926), and *The Sisters* (another unfinished novel, 1928). There has been published a great deal of litera-

ture about Conrad: including a *Life of Conrad* by Ford Madox Ford (1924); *Joseph Conrad: Life and Letters*, by G. Jean-Aubry (2 vols., 1927); *Letters from Joseph Conrad, 1895-1924*, edited with an introduction and notes by Edward Garnett (1928); *Letters of Joseph Conrad to Richard Curle*, edited by Richard Curle (1928); and *The Last Twelve Years of Joseph Conrad*, by Richard Curle (1928).

**CONSCIOUSNESS AND THE UNCONSCIOUS.** The conception of consciousness was revolutionized in the period since 1914 by the action of two antithetical extremist movements. These movements were behaviorism and the new psychology centring around psychoanalysis and clinical investigations of abnormal psychology. The theoretical principles in the name of which they took the field against the old-fashioned structural psychology were diametrically opposed, but the new schools were at one in their dissatisfaction with experimental introspection as a method for dealing with the practical problems of psychology.

The systematic position of structural psychology was expressed in the doctrine of psychophysical parallelism; this doctrine not only gave a certain theoretical clearness to the problems of psychology, but what is more important, it lent itself to a vast experimental programme. Psychical phenomena were regarded not as in any sense caused by physical or physiological phenomena but as running parallel with the lower series. The hypothesis of parallelism dates back to the seventeenth century, when it was used as a metaphysical theory to explain the entire structure of the universe. In its modern form, the hypothesis was less pretentious. It took psychological and physical experience at their common-sense face value and postulated as a method of investigation and comparison the non-interaction of the two series. In order to compare consciousness with physiology, it was necessary to analyze its structure. This was done by the method of introspection; in opposition, that is, to the method of logical reflection 'under which philosophers down to Kant had decomposed the mind into abstract categories or faculties. The analysis of consciousness was carried on under experimentally controlled external conditions, and in this manner consciousness was first decomposed into sensations as elements, and when this theory proved untenable, into attributes as the fundamental units. These attributes, such as extensity, duration, clearness, quality, and intensity, were aspects of conscious life corresponding to specific alterations of physical or physiological conditions. By the method of controlled introspection experimental psychology was designed to avoid the Scylla of the subjective faculty psychology and the Charybdis of materialistic mechanism; but in the view of its opponents, structuralism sinned in both directions. In actual practice, the theory of psycho-physical parallelism was held to approach more and more the doctrine known as epiphenomenalism, according to which consciousness was only a phosphorescence peculiar to the biological behavior of the neuron particles. Structuralism certainly failed to satisfy the common-sense belief in the efficacy of mind on the material world. On the other hand, its preoccupation with defining mental life in terms of a logical system drew on it the wrath of those who were growing impatient at the failure of psychology to become a science like other sciences.

Add to this the failure to deal adequately with perception and with the higher thought processes, and its rather uncertain stand in the case of instincts and the general substratum of our conscious life, and we are in a fair way to appreciate the significance of the revolt against structuralism as a psychological doctrine.

If one should employ a metaphor drawn from politics, the revolt of behaviorism might be characterized as a revolt from the left; that is, in the direction of more mechanical objectivity. The revolt of the psychoanalytic movement would then be a push from the right. Behaviorism (q.v.) developed out of the objective methods of animal psychology and biology and in theory sought to abolish consciousness as anything but a functional relation of physiological reflexes. It achieved thereby unity of method, but only at the expense of ruthlessly exterminating the chiaroscuro of mental life. Behaviorism, whatever its significance in psychological experimentation, marked a return to the metaphysics of the man-machine with the addition of the notion of the conditioned reflex. It is this conditioned reflex, the phenomenon that we observe so frequently in gymnastic training, that is the unconscious saving grace of behaviorism, for willy-nilly it imprints into the rigid materialistic mechanism the principle of contingency. Several attempts have been made to combine behaviorism with a realistic metaphysic for the evident purpose of eliminating consciousness as a directing principle in the universal drama. Typical of these are the works of E. B. Holt (*The Concept of Consciousness*, 1914 and *The Freudian Wish*, 1915) and articles by Prof. R. B. Perry. On the other hand the English Neo-Realist, Prof. S. Alexander, while postulating a general monistic position, yet refuses to reduce the quality of consciousness to any of the lower levels of existence. To him, it is a quality over and above the nervous system in much the same manner that life is something beyond the physico-chemical reactions of the living plant or animal.

The line between the scientific aspects of the problem of consciousness and the radiating metaphysical speculations is always difficult to draw, and it is still more difficult to maintain in the concept of the unconscious. The importance of this notion has arisen from its growing use in clinical psychiatry, where it serves to explain and to link together facts which cannot be organized on the old hypothesis of parallelism. The unconscious might have remained merely a romantic idea dear to the metaphysicians of Schopenhauerian descent had not the French school and the psychoanalytic group developed it into a systematic theory of neuroses and psychoneuroses. It is in vain, therefore, that Knight Dunlap protested (*Mysticism, Freudianism and Scientific Psychology*, 1920) against the unscientific nature of the new movement. The theory of the unconscious is much less rigorous than the theories employed in the physiological branch of psychology, and it is moreover based on a different method of approach and different type of word symbols; hence arise problems of liaison between the so-called old and new psychology. But withal, the Freudian theory of the unconscious, despite its admitted lack of rigor and its tendency to degrade into extravaganzas, is preferable to a refusal to organize the phenomena of abnormal psychology at all.



In brief, what is postulated by the theory of the unconscious is a hierarchic continuity of psychic life extending indefinitely back into the history of the individual, the history of the race, and ultimately into the history of life itself. Whereas we ordinarily explain conscious experience by the presence of physical stimuli outside the body, the theory of the unconscious explains a great part of conscious phenomena, particularly those which are not explained by the first method, by past history. In dream life, very little correlation can be traced between the mental phenomena and the physical stimuli affecting the person; much more interesting correlations can be obtained between the events of a dream and the past history, or even the future, of the individual. For an opposing view, consult L. H. Horton, *The Dream Problem* (1925). Even in normal consciousness, there appears to be much more in the mind than the stimulus which has given rise to the sensory experience, and the residue is generally explained on the basis of memory. The parallelistic hypothesis is unable to account for the impulse to action save by the intervention of a new mechanism, from which consciousness is excluded, the mechanism of reflexes, instincts, and habits. The theory of the unconscious is an effort to unify the three schemas of sensory perception, memory, and instinctive response into a single chain. What we regard as full or clear consciousness is merely the end product of a historical evolution. As an end product, it contains the cumulative story of the past, a story which can be recovered by the proper analytic method.

The method of analysis parallels the comparative method of biology in searching for vestigial traces. Obviously, it cannot be mere external observation by the microscope and the scalpel, since that form of observation is insufficient to detect even the grosser biological evolution. The analysis has to be within consciousness, or within the lower levels of consciousness manifested in hypnosis or in dreams, and when this is insufficient, selected facts from the history of the individual are introduced. The event of breaking a leg is not generally of much importance to the subsequent morale of the individual, but a childhood fear, long since forgotten, may be the missing link which accounts for a present psychological condition. The daring genius of Freud has consisted very largely in seizing on certain facts as significant which to other observers seemed irrelevant. Prof. Pierre Janet in recent years elaborated a theory of various levels of psychological tension, according to which there are stable gradations of plateaus in the continuity from psychological automatism to the highest levels of reflective conscious activity. These levels are interestingly correlated with the physical metabolism of the organism. Thus, the execution of a conscious and deliberate act was found to demand a greater expenditure of physical energy than the same act executed as a reflex. This theory serves also to make more understandable not only the phenomena of sleep and hypnosis but the fluctuations in the behavior of psychopathological cases.

Another ramification in the theory of the unconscious is the problem of multiple personalities. The clinical evidence on this subject shows all gradations from what might be regarded as metaphorical divisions of personality to genuine cleavages in conscious activity. Im-

pressed by these phenomena, Dr. Morton Prince and Prof. William McDougall have fought for a recognition of pluralism. Professor McDougall's method of meeting the problem is through a revision of the Leibnizian monadology. From the point of view of positive science, this problem, in reality the metaphysical problem of the one and the many, is quite irrelevant. Whether the individual be regarded as a distinct consciousness or as a collection of conscious instincts, or monads, it is evident that here is no escape from the paradox of unity and diversity. In cases of multiple personality, it is the type of unity and the type of diversity which differ from those to be found in a normal conscious personality with multiple interests. The relation of consciousness and the unconscious to the instincts or heredity tendencies is equally a problem of the one and the many. Freudian psychologists often identify the unconscious with the sex instinct and, at other times, they speak of the sex instinct as an instinct among other instincts. At other times, they split the unconscious into two warring entities. These ambiguities are practically unavoidable in the attempt to give dialectic movement to the life of the psyche. The physical instinct of sex, because it is in the generality of men the strongest of the discrete physical urges, as well as the most mysterious, has very frequently been employed as a symbol for the entire drive of life. Plato's Eros is an instance in point. But the symbol qua symbol of an underlying reality cannot be confounded with the symbol qua independent entity. The whole theory of sublimation hinges on the distinction between symbol and reality; for it is not sex, regarded as a discreet instinct, that is sublimated into intellectual or artistic activity; it is rather the *élan vital* expressed in the sex instinct which has found new channels. Yet from a phenomenological view it would seem as if there were a real conversion or substitution.

From the foregoing discussion it is evident that the representative theory of consciousness, according to which the mind carried a point-to-point image of a physical reality, must now be regarded as obsolete. If our psychological life is made up of images, then our physical experience too is made up of images or symbols. The latter symbols or images are more stable and conventional than the so-called fainter images of the subjective consciousness, but they are not different in kind. If consciousness be regarded as the phenomenon of knowledge or intelligible awareness, it follows that we never escape that phenomenon in all human experience. But if consciousness be employed in another sense to denote the subjective level of experience, then the phenomena of consciousness form a distinct subject matter of science, a subject matter paralleling biology but not reducible to it. And this science has now been organized by means of the unconscious as a concept of continuity. The unconscious must not be hypostasized into an entity, for like the concept of an imaginary number in mathematics, it makes trouble when it is set up against concrete physical experience, although it remains perfectly intelligible in its scientific setting.

It is useful for many purposes to correlate one level of experience with another and, in this respect, there will always be room for a science of physiological psychology which uses the method of controlled introspection. This science is an-

alogous to the sciences of biochemistry (q.v.) and biophysics, but like the latter it can only make correlations and cannot reduce the facts of one level to those of a lower level. Under the view here exposed, there is justification for all the prevailing methods of investigating the phenomena of consciousness, but the justification cannot be extended to the metaphysics which is consciously or subconsciously brought in with each method. Thus, behaviorism is a metaphysic means of materialistic monism, but this extrapolation of the doctrine is not at all necessary to the positive method of charting individual behavior and thereby predicting conduct. The same principle applies to structuralism and the psychoanalytic methods of investigating consciousness. Whatever conflict arises exists between rival metaphysical dogmas and not in the positive intellectual organization of facts.

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**CONSTANT, FRANK HENRY** (1869- ). An American engineer, born at Cincinnati, Ohio, on July 25, 1869. He was graduated in 1891 at the University of Cincinnati, and at once entered upon the practice of his profession, as assistant engineer of the King Bridge Company. In 1893-95 he was with the Osborn Engineering Company. In 1895 he became assistant professor of structural engineering at the University of Minnesota and two years later was made full professor. In 1914 he was called to the chair of civil engineering and made head of the department at Princeton.

**CONSTANTINE I**, kōn'stan-tīn, KING OF GREECE (1868-1923). (See VOL. V.) His connection with the German Imperial family (his wife was the sister of the former German Emperor) and his known sympathies for German methods generally, prompted him to maintain Greek neutrality in the World War. The ensuing struggle between him and Venizelos, who was disposed toward an alliance with the Allies, in large part made up the history of Greece in the eventful years 1914-17. The occupation of Saloniki by an Allied Army, the formation of a Venizelist "Provisional government," the capture of Athens by English and French contingents, all combined to seal Constantine's fate. He yielded to the Allied demand and on June 11, 1917, relinquished his throne in favor of his second son Alexander, living in exile until December, 1920. The death of his son and the overthrow of Venizelos in the election of November, 1920, resulted in his triumphal reentry into his capital, and it was largely to rehabilitate his fortunes that he embarked on the Anatolian adventure (June, 1921). The disastrous defeat that his armies suffered in the Greco-Turkish War (1921-22) and the consistent refusal of the Allies to support or recognize his aspirations again combined to embarrass him, and he was forced to abdicate a second time, Sept. 27, 1922. He took refuge at Palermo, where he died, Jan. 11, 1923. See GREECE, under *History*.

**CONSTANTINOPLE.** The maritime centre and principal city of Turkey. The population including Scutari, Pera, and Stamboul, according to the census of 1927, was 673,029. One of the most dramatic changes made by the Nationalist government was the shifting of the capital of Turkey from Constantinople to Angora. On Apr. 11, 1920, the Constantinople Parliament was dissolved, and on Oct. 13, 1923, by decision of the Grand National Assembly, Angora was declared to be the capital of Turkey. Up to the abdication of the Sultan in November, 1922, however, a government deriving its authority from him continued to exist in Constantinople but exerted no effective power outside the city. In the Grand National Assembly, Constantinople has only 15 deputies, or 5 per cent of the total number in the Chamber, and this city of past power has become merely a province of the Nationalist government. The occupation of Constantinople by the Allies also came formally to an end in October, 1923.

The most important events that have taken place in Constantinople are the refugee situation, the devastating fires, and the emancipation of women. During the War, refugee populations of entire villages—Greek, Armenian, Russian, Jewish, Georgian—reached the city penniless, there to live in open streets, on the ruined walls, in huts made of boxes, and in discarded army tents. The Red Cross and Near East Relief adequately met the situation, establishing camps, hospitals, clinics, workshops, and orphanages. By the activities of these organizations, it is estimated that in the Near East 1,500,000 lives were saved, 132,500 of them being orphan children; 12,500,000 persons were fed during famine periods; and 6,000,000 persons received medical aid. The destruction caused by devastating fires has also caused great suffering in Constantinople. The Turkish daily, *Vakit*, announced in 1920 that during the past decade 17,191 buildings in Constantinople had been burned, yet within that period only 532 structures had been rebuilt. These losses have been attributed to the typical frame construction, lack of repair, and a primitive system of fire control.

A third great change has been the emancipation of women. With the passing of harem traditions, the women of Constantinople have advanced from a childlike ignorance to an intelligence that is astonishing when the conditions under which they have lived for hundreds of years are considered. The University of Constantinople, including the medical department, has been opened to women students, and women are found at work in the offices of the Government or in business houses. The Nludafa-a-y-Houkouki Nissvar (Society for the Defense of the Rights of Women) which was organized at Constantinople in 1923 has these aims: To transform the outdoor costume of Turkish women (casting aside the veil); to ameliorate the rules of marriage according to the exigencies of common sense; to fortify woman in the home; to render mothers capable of bringing up their children according to modern principles; to encourage women to earn their own living and to find them work in order to remedy the present evils; to open women's schools in order to give to young Turkish girls an education suited to the needs of their country and to improve those schools already existing.

The shipping activities of Constantinople are devoted primarily to through traffic and trans-

shipment. In 1927 the number of vessels clearing and in transit was 13,195, with a total tonnage of 11,321,654. In 1926 the Turkish government created a free zone at Constantinople in the neighborhood of Seraglio Point. Further docks were erected, landing cranes installed, and other modern improvements undertaken. The Hippodrome is being excavated under the direction of archaeologists of the British Academy with the understanding that the treasure found is to be handed over, in accordance with Turkish law, to the Stamboul Museum. In 1925 Yildiz Kiosh, famous as the residence of Sultan Abdul Hamid, was converted into a casino. See DARDANELLES and BOSPORUS STRAITS.

**CONSTITUTIONAL LAW.** See LAW, PROGRESS OF THE.

**CONSUMERS' COÖPERATION.** See CO-OPERATION.

**CONTINUATION SCHOOLS.** See EDUCATION IN THE UNITED STATES.

**CONTRACT, LIBERTY OF.** See LAW, PROGRESS OF THE.

**CONTRACTS.** See LAW, PROGRESS OF THE.

**CONVOY.** See WORLD WAR.

**CONWAY, ROBERT SEYMOUR** (1864- ). An English classical philologist (see VOL. VI). He was lecturer in classics at Harvard University in 1927 and Wilding Lecturer in Christchurch College, Canterbury, New Zealand, in 1928. Honorary degrees were bestowed on him by Dublin (Litt.D., 1921), Padua (1922), and Oxford (D.Litt., 1928). His later works include *New Studies of a Great Inheritance* (1921); *The Making of Latin* (1923); *Poetry and Government* (1928); and *Harvard Lectures on the Vergilian Age* (1928).

**CONWAY, SIR (WILLIAM) MARTIN** (1850- ). An English art critic and explorer (see VOL. VI). He became trustee of the Wallace Collection (1910), trustee of the National Portrait Gallery (1922), and president of the Kent Archaeological Society (1923). His recent books include *The Sport of Collecting* (1914); *The Crowd in Peace and War* (1915); *The Abbey of St. Dennis* (1916); *Mountain Memories* (1920); *The Van Eycks and Their Followers* (1921); *Palestine and Morocco* (1923); and *Art Treasures of Soviet Russia* (1925).

**COOK, GEORGE CRAM** (1873-1924). An American author, born at Davenport, Ia., and educated at the universities of Iowa, Harvard, Heidelberg, and Geneva. In 1895-99 he taught in the University of Iowa and afterward for a short time in Leland Stanford, Junior, University. In 1911 he became associate literary editor of the *Chicago Evening Post*, and in 1915 director of the Provincetown Players. His works include: *In Hampton Roads* (1899); *Roderick Taliaferro, a Story of Maximilian's Empire* (1903); *Evolution and the Superman* (1906); *The Oasism* (1911); *Battle-Hymn of the Workers* (1912); *The C. T. U.* (1914); *Suppressed Desires* (1920; first written as a play in 1915); and *The Spring* (1921; produced as a play and published).

**COOK, PHILIP** (1875- ). An American Protestant Episcopal Bishop of Delaware, born at Kansas City, Mo. He was graduated at Trinity College in 1898 and from the General Theological Seminary in 1902. Ordained in 1902, he served as a missionary in North Dakota for two years and then became vicar of the Chapel of the Incarnation in New York City. In 1911 he was called to other pastorates, going

to Baltimore in 1916, where he remained until 1920, when he was elected Bishop of Delaware. He was a delegate to the General Conventions of the Protestant Episcopal Church in 1913 and 1919. During the World War, he served in France with the 77th Division of the American Expeditionary Forces as Y. M. C. A. secretary.

**COOKE, MARJORIE BENTON** (?-1920). An American author, born at Richmond, Ind. She began writing for magazines at an early age, and won success for her monologues, which she delivered throughout the country after 1902. Three one-act plays by her were produced on the stage. *Bambi*, a novel produced in 1914, had an immediate and remarkable success. She also wrote: *Modern Monologues* (1903); *Dramatic Episodes* (1905); *Plays for Children* (1905); *The Girl Who lived in the Woods* (1910); *Dr. David* (1911); *The Dual Alliance* (1915); *Cinderella Jane* (1917); *The Threshold* (1918); *The Clutch of Circumstance* (1918); *The Cricket* (1919); *Married?* (1921). She died in 1920 while in Japan on a world tour.

**COOKE, MORRIS LLEWELLYN** (1872- ). An American engineer, born at Carlisle, Pa. After having served as a reporter on various Philadelphia, Denver, and New York newspapers, he was graduated from Lehigh University (M.E., 1895). He practiced his profession with various corporations until 1905, after which he devoted himself to consulting practice. In 1910 he made a study of collegiate administrative methods for the Carnegie Foundation. In 1911-15, he was director of the Department of Public Works in Philadelphia. During the Spanish-American War, he served in the United States Navy as assistant engineer, and during the World War he was in Washington as chairman of the storage system of the War Industries Board of the Council of National Defense (1917) and as assistant to the chairman of the United States Shipping Board (1918). He is the author of *Academic and Industrial Efficiency* (1910), *Snapping Cords* (1915), and *Our Cities Awake* (1918).

**COOK ISLANDS.** See PACIFIC OCEAN ISLANDS.

**COOLEY, MORTIMER ELWYN** (1855- ). An American engineer (see VOL. VI). He was elected president of the Federated American Engineering Societies in 1921 and continued the investigation of public utility properties in American Cities.

**COOLIDGE, ARCHIBALD CARY** (1866-1928). An American professor of history, and one-time member of the diplomatic service (see VOL. VI). In 1918 he was sent as special agent of the American State Department to Sweden and northern Russia. The following year, he was chief of the mission attached to the Peace Conference which spent five months in Vienna and three months in Paris. In 1921 he became a member of the American Relief Administration in Russia. He was author of *The Origins of the Triple Alliance* (1917), and translator of *Secret Treaties of Austria-Hungary, 1879-1914*, by Alfred Francis Pribram (2 vols., 1920-21). He was also a contributor to *The American Historical Review* and other publications and was editor of *Foreign Affairs*.

**COOLIDGE, CALVIN** (1872- ). A President of the United States, born at Plymouth, Vt. He was graduated at Amherst College, Mass., and practiced law at Northampton, Mass.

After holding various local offices, he served in the Massachusetts State Senate (1912-15), was Lieutenant Governor of Massachusetts (1916-18), and Governor (1919-20). He first became nationally known through his intervention in the Boston police strike of 1919, when his prompt action in calling out the State troops prevented serious trouble and ended the strike. He was hailed throughout the nation as a strong champion of law and order, and his selection as candidate for the vice presidency was felt to add greatly to the chances of Republican success at the polls. At the convention, he was nominated by acclamation. When President Harding died on Aug. 2, 1923, Calvin Coolidge became President, taking the oath of office on August 3. He announced that he would follow in general the policies of his predecessor. Toward the end of the year 1923, the so-called "oil scandals" caused him much embarrassment. Both civil and criminal actions were begun in the courts by the Government and continued with varying success. The criticisms launched against Attorney General Daugherty and Secretary of the Navy Denby finally forced their resignations from the cabinet and relieved the situation somewhat. But Congress proved more and more independent of his leadership by passing the bonus bill over his veto, changing the Mellon Tax Bill, and refusing to accede to his request in regard to postponing the operation of the Japanese exclusion part of the Immigration Bill. He was nominated at the Republican National Convention in June, 1924, as candidate for the Presidency to succeed himself and was elected on November 4, obtaining 382 electoral votes from 35 states. In the first year of his second administration, there was a material reduction in the public debt and also in Federal taxation. In 1927 he vetoed the McNary-Haugen Bill for farm relief. It was generally conceded that he could have obtained the party's nomination for the Presidency in 1928, but on Aug. 2, 1927, he announced that he did not "choose to run for President in 1928." In the same year, his appointment of Dwight Morrow as Ambassador to Mexico resulted in greatly improved relations between the two countries. In January, 1928, he made his first trip outside of the United States while President to address the Pan-American Conference at Havana, Cuba. He lent his support to the Kellogg Peace Pact but was criticized because he advocated in an Armistice Day speech, Nov. 11, 1928, the adoption by Congress of a cruiser-construction programme which had been considerably reduced from that proposed in a bill introduced in the preceding Congress. At the conclusion of his term, he returned to his home at Northampton where he wrote a number of magazine articles on his life and various aspects of the Presidency. Two collections of his speeches have been published, *Have Faith in Massachusetts!* (1919), and *The Price of Freedom* (1924).

**COOLIDGE, WILLIAM DAVID** (1873- ). An American physical chemist and inventor, born at Hudson, Mass. He received his technical training at the Massachusetts Institute of Technology, and Leipzig University (Ph.D., 1899). During the years 1901-06, he was successively instructor and assistant professor in physical chemistry at the M. I. T. From 1905 to 1908, he was engaged on research in physico-chemistry for the General Electric Company at Schenectady, N. Y., and since 1908 he has been

assistant director of that company's research laboratory. He was awarded the Rumford Medal in 1914 for the invention and applications of ductile tungsten. He also received the Howard N. Potts Medal for the development of a new and improved X-ray tube, the Louis Edward Levy Medal of the Franklin Institute, and the gold medal of the American College of Radiology. He is a member of the National Academy of Sciences.

**COOPER, COLIN CAMPBELL** (1856- ). An American artist (see VOL. VI). He won a gold medal for oil painting and a silver medal for water color at the Panama-Pacific International Exposition (1915) as well as other prizes in 1918 and 1919. One of his best recent pictures was "Broadway in War Time" in the Pennsylvania Academy of Fine Arts.

**COOPER, HUGH LINCOLN** (1865- ). An American hydraulic engineer, born at Sheldon, Houston Co., Minn. With only a high-school education, he began in bridge engineering at eighteen and at twenty-five was chief engineer and superintendent of the Chicago Bridge & Iron Co. Since 1891 he has been engaged in hydraulic engineering as applied to power development for electric uses. He designed and largely built the hydroelectric plant of the Mississippi River Power Company at Keokuk, Iowa, the Toronto Power Company's plants at Niagara Falls, and the Muscle Shoals, Ala., water-power project. Later, he was consulting engineer for a \$75,000,000 water-power and navigation project in Ukraine, Russia, and was commissioned to design the great power dam in Egypt.

**COOPER, IRVING STEIGER** (1882- ). An American bishop of the Old Catholic Church, and theosophist, born at Santa Barbara, Calif., and educated at the University of California and at Madras, India. He was consecrated regionary bishop for the Liberal Catholic Church for the United States, in 1919. He wrote: *Methods of Psycho Development* (1911); *Ways to Perfect Health* (1912); *The Secret of Happiness* (1912); *Theosophy Simplified* (1915); *Reincarnation, the Hope of the World* (1917).

**COOPER, THE REV. JAMES** (1846-1922). A British theologian (see VOL. VI). In 1916 and again in 1921, he was president of the Scottish Ecclesiological Society, an office which he had held in 1903 and 1911. He was Moderator of the General Assembly of the Church of Scotland in 1917. In 1922 he retired from his professorship in church history at the University of Glasgow. His later works include: *Our Sacred Heritage* (closing address as Moderator, 1917), and *Reunion, a Voice from Scotland* (1918).

**COOPER, LANE** (1875- ). An American university professor (see VOL. VI). He was acting associate professor during the summer term of 1914 at the University of Illinois. The following year he became full professor of English language and literature at Cornell University. Among his later works are *Methods and Aims in the Study of Literature* (1915, 1921); *A Concordance to the Works of Horace* (1916); *Louis Agassiz as a Teacher* (1917); *The Greek Genius and its influence* (1917); *George Meredith, an Essay on Comedy* (1918); *Two Views of Education, with Other Papers* (1922); *An Aristotelian Theory of Comedy* (1922); *Concordance of the Latin, Greek and Italian Poems of John Milton* (1923); and *The Poetics of Aristotle* (1923).

**COOPER, THOMAS POE** (1881- ). An American agriculturist, born at Pekin, Ill. From 1902 to 1907, he was statistical agent of the Minnesota Experiment Station and special agent of the Bureau of Statistics, United States Department of Agriculture. He graduated from the University of Minnesota in 1908 and until 1911 was assistant in farm management and agricultural economist at that university. From 1914 to 1917, he was director of the North Dakota Experiment Station and in 1918 became dean and director of the Agricultural College of the University of Kentucky. He was chief of the Bureau of Agricultural Economics, U. S. Department of Agriculture, 1925-26.

**COOPER, WILLIAM JOHN** (1882- ). An American educator, born in Sacramento, Calif., who was appointed head of the U. S. Bureau of Education by President Coolidge in December, 1928. He attended the University of California, receiving the degrees of A.B. and M.A., and then became successively teacher, supervisor, and district superintendent in various California public and high schools. He also taught education at summer sessions of the Universities of California, Oregon, and Washington. He was superintendent of schools at Fresno, Calif., from 1921 to 1926, and at San Diego, Calif., from 1926 to 1927, when he was appointed state superintendent of public instruction.

**COÖPERATION.** If one idea has taken universal hold in our modern industrial world, it is that of the coöperative society. It has many phases: there are coöperative stores, credit unions, building and loan associations, insurance groups, agricultural pools, artisans' and labor productive societies, etc. Local societies are grouped together sectionally and nationally. In some countries, from 40 to 45 per cent of the population was being reached through consumers' coöperative organizations. In 35 countries<sup>1</sup> examined by the U. S. Bureau of Labor Statistics, there were found to be 300,000 societies with a combined membership of more than 44,500,000 persons. The consumers' coöperatives alone number 50,000 societies in 22 countries, with a membership of 27,000,000 persons and yearly sales of over five and one-half billion dollars. A single fact, such as the following, is of extraordinary significance: The English Coöperative Wholesale Society was the largest manufacturing, trading, and landowning unit in the United Kingdom.

In Great Britain, there were 1825 consumers' coöperatives with 5,017,464 members; in Denmark, 5148 societies with 865,002 members; in France, 4131 with 3,111,322 members; in Germany, 50,181 with 3,382,011 members; in India, 61,016 with 2,508,827 members; in Russia, 78,865 with 19,129,033 members; in the United States, 12,149 with 2,815,230 members. In various countries, various types of societies had been developed more rapidly than others. In Great Britain and the United States, the consumers' coöperatives led all the rest. In Germany, the credit society had flourished mightily; and in Denmark, the agricultural society led. France and Italy were the homes of workmen's produc-

tive groups, and while in Italy these had been destroyed by the Fascist régime, in France, they still prospered.

The following table indicates how important consumers' coöperatives are in some of the countries of the world:

PERCENTAGE THROUGH	OF POPULATION OF CONSUMERS' SOCIETIES	SUPPLIED COÖPERATIVE	Per cent
United Kingdom			45
Denmark			40
Finland			40
Hungary			40
Iceland			35-40
Switzerland			35
France			30
Russia			30
Belgium			20
Germany			20
Sweden			20
Norway			15
Netherlands			10
Bulgaria			8
Australia			6
United States			2.5
Argentina			1

An examination of the membership and sales of local consumers' societies for the most successful countries in which the system is in operation (compared with the United States) would indicate the following:

Country	Average membership per society	Average yearly sales per society	Average yearly sales per member
Belgium	5,004	\$357,885	\$71
Great Britain	3,810	687,764	181
Germany	3,218	139,536	43
Australia	2,888		
United States	810	105,543	354

The Federal Bureau of Labor Statistics in 1927 published an important summary of the growth of the coöperative movement (other than agricultural) in which it pointed out the following facts about coöperation in the United States: 1. In 1925 the total coöperative membership was 700,000; the business done was \$300,000,000, and several million people were reached. 2. The Middle West has been the seat of the greatest development of the consumer's coöperatives. Credit unions, which had their greatest growth after 1920, developed largely in the East. 3. The workers' productive societies have shown the smallest growth. In 1925 these societies, which had some 4500 members, did a business of \$9,000,000. 4. The credit unions have developed more rapidly than the regular consumers' societies. In 1925 these made loans of more than \$20,000,000 and had a membership of 170,000 persons. 5. The housing coöperative societies have made their appearance for the most part in New York City. These groups have provided dwellings for 1805 families and own \$4,000,000 in property. 6. The consumers' societies appear to have weathered successfully the hard times that followed 1920. In 1925 nearly 25 per cent of these had sales of \$100,000 or more. Nearly three-fourths of them showed profits for the year. The societies have been putting their money into reserves instead of distributing them as dividends, as shown by the fact that the reserves of the societies total more than half of the paid-in share capital. 7. The coöperative wholesale business appears to have been abandoned. The following table shows the existence of the societies by geographical divi-

<sup>1</sup> These countries are:

Argentina, Australia, Austria, Belgium, Bulgaria, Canada, Ceylon, China, Czechoslovakia, Denmark, Egypt, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, India, Japan, Jugo-Slavia, Latvia, Malay States, Netherlands, Norway, Palestine, Poland, Portugal, Rumania, Russia, South Africa,



TABLE 2  
PERCENTAGE OF TOTAL COÖPERATORS  
[By geographical divisions]

	Consumers' societies	Credit and workers' societies
New England	18.9	48.2
Middle Atlantic	10.3	45.4
East North Central	29.0	1.5
West North Central	27.2	.5
South Atlantic	1.0	1.9
East South Central	.5	.7
West South Central	1.3	.9
Mountain	.8	..
Pacific	11.1	.9
Total	100.0	100.0

The accompanying two tables show the status of the consumers' societies in the United States:

TABLE 3  
TOTAL AND AVERAGE MEMBERSHIP OF CONSUMERS' COÖPERATIVE SOCIETIES  
IN 1925

Type of society	Number of societies reporting	Membership Total	Average per society
Retail store societies dealing in:			
General merchandise	310	55,431	179
Groceries	47	11,129	237
Groceries and meats	38	21,399	563
Students' supplies	9	30,848	3,428
Other commodities	5	953	191
Total	409	119,760	293
Gasoline filling stations	7	3,615	516
Bakeries	9	4,834	537
Laundries	2	263	132
Boarding houses	11	1,578	143
Restaurants	5	2,733	547
Water-supply societies	2	76	38
Miscellaneous societies	5	6,442	1,288
Grand total	450	139,801	310

TABLE 4  
COMPARISON OF BUSINESS DONE BY CONSUMERS' SOCIETIES EACH YEAR, 1920 AND 1925

Type of society	1920	1925
	Num-ber of socie-ties Amount of business	Num-ber of socie-ties Amount of business
Retail store societies handling:		
General merchandise	204 \$24,097,722	322 \$29,610,248
Groceries	30 2,363,523	49 3,437,979
Groceries and meats	26 2,495,261	36 4,346,690
Students' supplies	7 1,079,981	11 2,899,628
Other commodities	5 326,621	8 401,069
Total	272 \$30,863,108	426 \$40,745,610
Wholesale societies	3 3,333,132	3 2,459,521
Gasoline filling stations	.. ..	9 742,473
Bakeries	6 571,434	9 1,189,737
Laundries	1 16,042	2 37,786
Boarding houses	3 145,051	10 150,853
Restaurants	3 112,707	5 679,110
Water-supply societies	1 589	2 1,559
Miscellaneous	3 809,710	5 3,704,189
Grand total	292 \$34,851,773	471 \$49,710,783

See AGRICULTURE for discussion of the agricultural coöperatives in the United States.

**COÖPERATIVE BANKS.** See LABOR BANKS.

**COÖPERATIVE MARKETING.** See CO-OPERATION; COTTON; AGRICULTURE; and AGRICULTURAL CREDIT.

**COÖPERATIVE MORTGAGE BANKING.** See AGRICULTURAL CREDIT.

**COOVER, JOHN EDGAR** (1872- ). An American psychologist born at Remington, Ind. He was educated at the Colorado State Normal School and Leland Stanford, Junior, University.

After 1910 he was a member of the psychology department of the last-named institution, becoming associate professor in 1921. He is the author of *Investigation with a Trumpet Medium* (American Society for Psychical Research, 1915), *Formal Discipline from the Standpoint of Experimental Psychology* (1916), and *Experiments in Psychical Research* (1917). He is also the contributor of a number of articles on psychology, psychical research, education, and statistical methods, published in professional journals.

**COPE, SIR ARTHUR STOCKDALE** (1857- ). A British portrait painter and fellow of the Royal Academy. After attending schools at Norwich and Wiesbaden, he studied art at Carey's and at the Royal Academy schools. His paintings, which he has exhibited at the Royal Academy since 1876, include portraits of King Edward VII, the German Emperor, King George V, and the Prince of Wales. He was knighted in 1917, and was made a Knight Commander of the Royal Victorian Order in 1927.

**COPEAU, kô'pô', JACQUES** (1879- ). A French actor-manager, formerly director of the Théâtre Vieux Colombier. He was a reformer in the theatre. He successfully waged war against decrepit tradition, but he kept traditions which remained full of life and richness. The Classics, for the most part, formed his repertory. Among his performances were: Dostoyevsky's *The Brothers Karamazov*, a very moving production and adaptation; *Twelfth Night*, one of the plays most frequently presented; and André Gide's *Saul*, one of his most important theatrical achievements. In 1919 the Vieux Colombier came to New York City, and he took the part of Washington in Percy Mackaye's *Washington*. He wrote *Miscellaneous Pamphlets and Clippings, 1914-1919*; *Études d'art dramatique; critique d'un autre temps* (1923), and *La maison natale* (1923; tr. 1924). Consult *The Art of the Vieux Colombier*, by Waldo David Frank (1918).

**COPELAND, ROYAL S (AMUEL)** (1868- ). An American physician and ophthalmologist, and United States Senator from New York. Born in Dexter, Mich., he received his M.D. from the University of Michigan, 1889, and in 1905 was made ophthalmologist to that university. He moved to New York in 1908 to occupy the same chair and assume the deanship of the New York Homoeopathic Medical College and Flower Hospital. He began his political career as mayor of Ann Arbor in 1901-03 and was president of the local Board of Education in 1907-08. In 1918, he became Commissioner of Public Health and president of the Board of Health, New York City, resigning in 1923 upon his election as Senator. He was reelected in 1928 for the term 1929-35. He published *Refraction*, in collaboration, in 1906, and *The Health Book* in 1924.

**COPEMAN, SYDNEY A. MONCKTON** (1862- ). A British physician and authority on public health, hygiene, and forensic medicine. He was educated in arts and medicine at the University of Cambridge, became a member of the medical faculty of the University of London, and lectured on his special subjects in a number of British universities. From 1916 to 1917, he was lieutenant colonel in charge of the hygiene department of the Royal Army Medical College. His principle work is *Vaccination, Its Natural History and Pathology* (1898).

**COPENHAGEN.** The capital and largest city of Denmark. The population in 1925 was 587,150; including the suburbs it was 731,496 or 21 per cent of the total population of the country. From 1916 to 1921, extensive harbor improvements were carried out, representing an expenditure of 40,000,000 kroner. These improvements involved the reclamation of more than 5500 acres of land and an increase in the bulhead of more than 5000 yards. The new harbor has a total expanse of about 13 kilometers (8.078 miles), the distance between the breakwaters on either side of the entrance being 8 kilometers (4.97 miles). The wharfage of the free port was increased to 4773 meters (5250 yards). In 1927, 17,000 vessels of 5,279,000 tonnage were cleared through the port of Copenhagen. The seat of the Government, the Foreign Office, and the Supreme Court have been located in Christiansborg Castle, which was built some years ago on the ruins of a former castle destroyed in the great fire of 1884. In the basement may be seen ruins of the former castle and fragments of Absalon's mediæval fortress which were revealed by excavations made in 1918. Over the gateway to the castle is a tablet, unveiled Feb. 11, 1919, in memory of the defense of Copenhagen in 1659—the 250th anniversary of the event. Other buildings in the vicinity are the old Hofteater (Court Theatre) which has been converted into a theatrical museum; the royal stables, housing a valuable collection of harness and coaches; the arsenal, containing a historical collection of arms; the royal archives from the time of Frederik III; and the royal library. The town has grown around the nucleus of these buildings, and their style of architecture and atmosphere, so to speak, pervades the city. Modern developments include the Langelinie Promenade fronting the free port, the grounds and wide boulevards which have been laid out on the old fortifications, the new Raadhus (City Hall), the botanical gardens, and Østre Anlægs Park. In 1924 the Museum of Decorative Arts was installed in a beautiful eighteenth-century edifice.

**COPPER.** The World War naturally had an important effect on the production of copper, as this metal was required in large quantities for munitions. The world's production amounted to 1,104,517 short tons in 1913, but under the stimulation of war-time needs, it reached a maximum of 1,585,228 short tons in 1917. Following the War, production declined to a minimum of 601,913 tons in 1921. Since 1921 world output has increased each year until it reached a record total of 1,954,021 short tons in 1928.

Production capacity developed to fulfill requirements during the War was greatly in excess of requirements during the period immediately following the cessation of hostilities. Legal restrictions in the United States prevented producers from making definite agreements to curtail and allocate production allowances in accordance with consumptive demand. Consequently, the industry passed through several years of overproduction immediately following the War with a resultant reduction of price levels that meant unprofitable operation for many producers, particularly in the United States where operating costs are high because of the low-grade ores treated, high labor costs, and exorbitant taxation charges in many States. The price of copper averaged 15.27 cents per pound in New York in 1913; in 1916

the average price per pound was 27.2 cents. During 1921, the year of greatest deflation, the price declined to 12.5 cents per pound. During the next six years, the average price remained below 14.5 cents per pound, but advanced to 14.57 cents in 1928 and was in excess of 10 cents per pound in the early months of 1929 as the result of a great increase in consumptive demand that taxed the productive capacity of the mines and metallurgical plants.

Several statistical organizations formed in the United States since the War have been of material assistance in directing the industry back into its path of normal progress. The American Bureau of Metal Statistics was formed in 1921 to compile and distribute data relating to production, stocks, and consumption of all the more important non-ferrous metals. In the same year, the Copper and Brass Research Association was organized to develop new uses for copper and brass products and to educate the public to the benefits that might be derived from the use of these products in places where other substances previously had been accepted without question. Copper Exporters, Incorporated, was formed in 1926 for the purpose of fixing prices in the export market. In 1927 the Copper Institute was formed for the purpose of providing domestic producers and particularly the selling agencies with detailed data of sales positions, stocks, shipments, and other information of that nature at weekly intervals. These various agencies have been important factors in securing the rationalization of the copper industry.

An unusually high rate of consumption prevailed during the closing months of 1928 that resulted in the breaking of all previous production and consumption records. Increased use of copper in such industries as automobile, radio, cable, railway electrification, building, and others, resulted in the speeding up of productive activity to a point never previously approached, not even during the height of the war-time demand.

The United States continues as the leading producer of copper, though Chile in second place is gaining ground and recent developments in Africa make it evident that ere long African copper will be a very important factor in the world trade. Increased production will come from Canada, also, from several new properties that are not yet fully equipped for operation, and from increased output of copper from the copper-nickel deposits of the International Nickel Company in Ontario. In the United States, on the other hand, no new properties of importance have been discovered, though there is little doubt that additional equipment at a number of the large mines will permit considerable expansion of productive operations.

Several new producers recently have made their entry, of which Andes Copper in Chile, Noranda in Quebec, and Bwana M'Kubwa in northern Rhodesia, are likely to prove of primary importance. Important new developments under way in 1929 included the Flin Flon and Sherrit-Gordon in Manitoba, and the Roan Antelope and N'Changa properties in northern Rhodesia. Present producers which can and doubtless will increase their capacity considerably if demand continues at the present high rate are Utah Copper, Nevada Consolidated, Inspiration, Phelps Dodge, and Calumet & Arizona in the United States; Chile Copper, Andes Copper, and Braden in Chile; Cerro de Pasco in

Peru; Noranda and International Nickel in Canada; Greene Cananea and Montezuma in Mexico; Furukawa in Japan; Union Minière du Haut Katanga in the Belgian Congo; and Bwana M'Kubwa and associated companies in northern Rhodesia.

### WORLD PRODUCTION OF COPPER From Mineral Industry

			Short Tons
1913	1,104,517	1921	601,913
1914	1,018,395	1922	996,147
1915	1,180,883	1923	1,411,980
1916	1,504,297	1924	1,522,394
1917	1,580,475	1925	1,589,717
1918	1,568,977	1926	1,634,193
1919	1,069,998	1927	1,681,643
1920	1,082,652	1928	1,883,431

### AVERAGE PRICE OF ELECTROLYTIC COPPER IN NEW YORK Engineering and Mining Journal

	Cents per Pound		Cents per Pound
1913	15.269	1921	12.502
1914	13.602	1922	13.382
1915	17.275	1923	14.421
1916	27.202	1924	13.024
1917	27.180	1925	14.042
1918	24.628	1926	13.795
1919	18.691	1927	12.920
1920	17.456	1928	14.570

### COPPER PRODUCED IN THE UNITED STATES FROM DOMESTIC ORES, 1927-1928

U. S. BUREAU OF MINES

(Smelter output, in pounds fine)

State	1927	1928
Alaska	56,489,214	40,541,968
Arizona	681,168,117	785,632,406
California	25,802,603	24,707,992
Colorado	8,006,801	10,262,083
Idaho	1,811,103	2,386,654
Michigan	195,135,199	179,104,311
Missouri	5,041	930
Montana	225,208,853	251,046,415
Nevada	118,298,342	159,332,977
New Mexico	79,761,222	92,777,233
North Carolina	5,362,041	8,207,000
Oregon	484,652	375,049
Pennsylvania	2,149,182	5,013,868
Tennessee	14,498,951	16,374,261
Texas	25,460	432,968
Utah	267,705,597	293,375,465
Vermont	238,148	.....
Washington	1,766,953	1,197,840
Wyoming	.....	2,575
Undistributed	123,509	178,898
	1,684,040,933	1,825,900,393

### WORLD'S COPPER PRODUCTION BY COUNTRIES \*

Country	1920	1921	1922	1923	1924	1925	1926	1927	1928
Africa	30,580	38,557	52,816	72,948	104,055	107,657	97,987	112,012	128,034
Australasia	26,605	18,932	12,478	18,139	14,253	12,318	10,200	11,612	11,654
Austria	1,585	4,173	4,581	4,833	4,051	3,325	3,719	3,600	3,300
Bolivia	9,900	9,683	9,212	10,654	7,439	6,804	6,441	7,122	6,804
Canada	35,500	20,532	22,952	36,496	46,274	51,020	58,173	64,137	87,666
Chile	98,952	59,239	129,575	182,884	190,880	189,503	202,319	239,720	239,895
Cuba	6,796	7,802	10,694	10,853	11,560	11,910	11,824	14,096	17,118
Germany	17,255	19,000	17,000	17,000 *	19,500 *	22,000	24,000	28,400	24,000
Italy	685	356	319	184	200	578	420	.....	.....
Japan	66,003	54,092	54,126	63,790	62,940	65,692	65,570	63,388	66,041
Jugoslavia	2,436	3,970	5,222	6,837	8,154	7,301	9,700	12,900	15,086
Mexico	45,238	12,316	27,073	54,920	44,589	53,636	56,521	57,843	65,844
Norway	556	5,725	9,615	8,000 *	9,900 *	12,500	12,500	12,000	13,132
Peru	32,982	33,284	36,408	44,186	34,923	37,358	42,369	47,572	52,463
Russia	.....	.....	2,000 *	2,000 *	3,300 *	6,578	10,835	12,000	13,000
Spain-Portugal	23,000	33,200	36,500	51,815	55,079	58,000	54,750	54,750	53,912
Sweden	1,627	1,329	61	4,700	2,800	2,268	4,324	3,795	907
United Kingdom	109	73	104	89	125	97	.....	.....	.....
United States	548,418	229,331	431,040	650,912	741,283	774,749	796,522	768,779	848,413
Other countries	5,000 *	5,000 *	5,000 *	5,000 *	6,000 *	11,400 *	11,100 *	11,838	11,380
Total	953,177	556,594	866,976	1,245,720	1,366,745	1,434,716	1,479,270	1,525,586	1,708,649

\* Am. Bureau of Metal Statistics, except as noted.

U. S. Bur. of Mines.

\* As officially reported.

\* Estimated.

### SUMMARY OF FEATURES OF THE COPPER INDUSTRY IN THE UNITED STATES IN 1927 AND 1928

U. S. BUREAU OF MINES

Production of copper:		1927	1928
Smelter output	pounds	1,684,040,933	1,825,900,393
Mine production	"	1,649,959,370	(*)
Refinery production of new copper:			
Electrolytic	"	1,520,076,181	1,607,120,026
Lake	"	195,135,199	179,104,311
Casting	"	3,740,819	5,573,050
Total domestic	"	1,718,952,199	1,791,797,387
Total domestic and foreign	"	2,325,763,709	2,487,607,779
Total new and old copper	"	3,806,000,000	(*)
Ore produced:			
Copper ore	short tons	56,725,460	(*)
Average yield of copper	per cent	1.41	(*)
Copper-lead and copper-zinc ores	short tons	418,601	(*)
Average price per pound	cents	13.1	14.4
Imports (unmanufactured)	pounds	718,322,990	787,073,640
Exports of metallic copper	"	1,069,493,121	1,121,186,640
Withdrawn from total supply on domestic account:			
Total new copper	pounds	1,422,959,219	1,608,538,578
Total new and old copper	"	2,403,000,000	(*)
Stocks of refined copper	"	171,000,000	114,000,000
Stocks of blister and materials in solution	"	401,000,000	423,000,000
Value of smelter production from domestic ores		\$ 220,609,000	\$ 262,930,000

\* Figures not yet available.

\* Total exports of copper, exclusive of ore, concentrates, composition metal, and unrefined material.

\* At the end of the year.

In 1928 exports of copper from the United States were valued at \$169,823,077 of which refined copper in ingots, bars, or other forms amounted to 948,309,890 pounds, valued at \$140,340,375. Germany was the largest customer for the refined metal, taking 206,549,919 pounds, valued at \$30,012,066; followed by the United Kingdom with 185,816,840 pounds, valued at \$27,657,763; France with 171,440,871 pounds, valued at \$25,821,800; Italy with 115,427,602 pounds, valued at \$17,606,139; Belgium with 77,431,816 pounds, valued at \$11,248,936. The United States in 1928 imported copper to the value of \$98,187,440, of which copper ores, concentrates, and regulus were valued at \$16,734,735. Unrefined, black, blister, and converter copper in pigs, bars, etc. were valued at \$67,598,035, and refined copper at \$12,634,463.

**CORAL REEFS.** See GEOLOGY.

**CORBIN, JOHN** (1870- ). An American dramatic critic and author (see VOL. VI). He wrote *The Edge* (1915) and until 1916 was secretary of the Drama Society of New York. From 1917 to 1919, he was dramatic critic of the New York Times and from 1919 to 1926 editorial writer for the same paper. He produced Shakespeare's *Tempest* (with full text in the Elizabethan manner) in 1916, and in 1922 published *The Return of the Middle Class*.

**CORELLI, MARIE** (1864-1924). An English novelist (see VOL. VI). Her later publications include: *Innocent, Her Fancy and His Fact* (1914, 1921); *The Young Diana* (1917); *My Little Bit, a Record of War Work* (1919); *The Love of Long Ago* (1920); *The Secret Power* (1921), and *The Treasure of Heaven: a Romance of Riches* (1921).

**COREY, WILLIAM ELLIS** (1866- ). An American capitalist, born in Braddock, Pa., and educated in the public schools and at Duff's College, Pittsburgh. He entered the Edgar Thompson Steel Works at the age of 16, and became superintendent of the plate mill at the Homestead Steel Works in 1889, succeeding Charles M. Schwab as general superintendent at these works in 1897. From 1901 to 1903, he was president of the Carnegie Steel Company, and from that year to 1911 was president of the United States Steel Corporation. In the latter year, he resigned this post to become chairman of the board of the Midvale Steel and Ordnance Company. He was director and official in many important financial institutions.

**CORFU DECLARATION** and Other Items. See ALBANIA; GREECE; ITALY; JUGOSLAVIA.

**CORK.** A commercial city of the Irish Free State and the third city of Ireland. The population of Cork County Borough in 1926 was 78,490. Cork's chief commercial advantage is its proximity to the Harbor of Cobh (Queenstown) with which it is connected by the River Lee. In 1927, 1377 vessels with a tonnage of 622,559 entered the port, and 1406 vessels with a tonnage of 623,570 were cleared. In December, 1920, part of the business section of Cork was burned in the course of a fire started by incendiaries. Since 1923 so many improvements have been carried out that the whole appearance of the city has been changed. The greater part of St. Patrick's Street, the principal thoroughfare, has been rebuilt; most of the principal streets have been remade with asphalt surfaces; all the quays have been relaid on concrete foundations; and the old sewage tunnel has been reconstructed. The water-supply system also has been over-

hauled, a filtration plant installed, and waste so efficiently eliminated that the daily consumption of water has been reduced from 50 to less than 30 gallons per head of population. In 1927 a municipal loan of £100,000 was provided for housing construction. One of the principal changes has been the location of the Ford motor industry in Ireland on Cork's once-famous race course.

**CORN.** Corn is produced on three-fourths of the farms in the United States. The average annual production of the country for the years 1919-28, inclusive, was 2,857,000,000 bushels. The average annual production of the leading corn states for the same period was as follows: Iowa, 431,820,000 bushels; Illinois, 321,278,000 bushels; and Nebraska, 217,380,000 bushels. The average acre yield in the United States increased from 26.1 bushels for the ten-year period 1910-19 to 28.25 bushels for the ten-year period 1919-28. According to U. S. Census reports, of a total acreage of 98,401,627 acres in 1924, 82,328,843 acres, yielding 1,823,880,173 bushels, were harvested for grain, 4,227,812 acres producing 28,407,960 tons were cut for silage, 6,672,646 acres were cut for fodder, and 5,172,326 acres were pastured off with hogs. Since the World War, corn production in southeastern Europe has more than regained its pre-war status. The corn area of Russia in 1928 was 10,690,000 acres, the area having more than doubled during the five-year period. Argentina, which has increased its average annual production in ten years, continues to lead all countries in corn exports.

The average annual total value of the corn crop of the United States for the five-year period 1910-14 was \$1,577,000,000, but the higher price of corn from 1916 to 1919 raised the value for that period to \$3,024,000,000. The 1920 crop was the largest ever harvested, but prices were receding and its total value was only \$2,150,000,000, while in 1921, with a yield only 4 per cent under the crop of 1920, prices had dropped so low that the total value was only \$1,303,000,000, or only 43 per cent of the annual value during the war period and about 16 per cent less than the pre-war value although the crop was 10 per cent larger than the pre-war average. During the War, the average farm price of corn rose above \$1.90 per bushel; but the price began to decline in 1920 and reached the low point at the end of 1921, reducing the purchasing power of corn far below that of any other year. A marked rise in the cost of production since 1914 coupled with the rapid and severe decline in price, was one of the principle factors leading to the agricultural economic crisis beginning in 1920 and continuing for a series of years.

The United States Grain Standards Act of Aug. 11, 1916, required that in all interstate buying and selling of shelled corn the grades used shall be the Federal grades established by the Secretary of Agriculture. According to these grades, based on condition and quality, the best corn is graded Number One and corn lower in quality is given numerical grades down to and including Number Six, while a "sample grade" is added for corn too low in quality for the numbered grades. As revised and effective Sept. 15, 1927, these standards include grades for weevily corn. To the insect pests attacking the corn crop in the United States was added the European corn borer, first reported near Boston in 1917, and now established in parts of the

New England States, New York, Pennsylvania, Ohio, Michigan, Indiana, and the Province of Ontario in Canada. (See ENTOMOLOGY, ECONOMIC, under *European Corn borer*). The diseases of corn which have become troublesome in recent years are the brown-spot disease, characterized by brown spots usually on the leaf, the leaf sheath and the stalk, and root rot of corn which results in the partial or total decay of the root system causing the plant to lodge, and which attacks also the stalk and the ear.

**Corn Products.** Statistics published by the U. S. Department of Commerce in 1928 showed that the United States in 1925 produced 854,125,000 pounds of cornstarch, 1,444,858,000 pounds of corn sirup, 580,370,000 pounds of corn sugar, and 12,705,000 gallons of corn oil. Corn oil, derived largely from the germ in the corn kernel and formerly used mainly in the manufacture of soaps and paints, is now refined and used for food in the form of lard and butter substitutes, salad and cooking oils, shortening, and other similar substances. It is also used in making rubber substitute. With the increase in the manufacture of corn products during the World War, the annual production of corn oil increased to some extent. Cornstalks, of which the United States, as estimated, produces annually about 125,000,000 tons, are used for the manufacture of paper and paper board and efforts are being made to put this industry on a profitable basis. Corn cobs used as fuel on farms are also utilized in making paper products, adhesives, furfural, and other commodities. Consult *United States Department of Agriculture Yearbooks*, 1921 and 1927. See AGRICULTURE.

**CORN BORER, EUROPEAN.** See ENTOMOLOGY, ECONOMIC.

**CORNELL, KATHARINE** (1900- ). An American actress born at Buffalo, N. Y., who made her first appearance in 1916 with the Washington Square Players in *Bushido* and remained with that company some time, playing *The Death of Tintagiles*, *Plots and Playwrights*, etc. In 1918 she was with the Jessie Bonstelle Stock Company at Buffalo and subsequently toured in *Cheating Cheaters* and *The Man Who Came Back*. In 1919 she played Jo in *Little Women* in London and the next year toured in *The Man Outside*. One of her best characterizations in New York was the part of Eileen Baxter-Jones in *Nice People* (1921). In 1924 she starred in *Candida* and in 1929 in *The Age of Innocence*.

**CORNELL UNIVERSITY.** A non-sectarian, coeducational institution at Ithaca, New York, established in 1865. The university's annual income available for current expenses increased between 1914 and 1928 from \$3,000,000 to approximately \$7,000,000 including \$2,038,000 of State and \$335,000 of Federal appropriations, and over \$250,000 from alumni. A campaign for new endowment, begun in 1919, yielded subscriptions of more than \$6,000,000, mainly in increased salaries for faculty members, and the total productive funds in 1928 were \$21,230,391. The enrollment of students in the autumn of 1928 was 5387 as compared with 5015 in 1914 and the faculty numbered 1106, an increase of 356 over 1914. The volumes in the library numbered 780,000 in 1928. The Baker Laboratory of Chemistry, for which George F. Baker gave \$1,500,000 and the \$400,000 State Building for the department of dairy industry,

were completed in 1923. Other notable gifts were \$500,000 from August Heckscher to endow general research, \$50,000 from Mrs. Sarah Manning Sage for medical research, and an anonymous gift of \$200,000 for pediatrics. In 1928 by agreement with New York Hospital, a single institution was formed to occupy jointly a new building to be erected at an estimated cost of \$11,000,000 between 68th and 70th streets, overlooking the East River, New York City, the joint endowment to be augmented by a large appropriation from the General Education Board and generous legacies provided by the will of Payne Whitney. In 1929 the University received a gift of \$1,500,000 for the erection of a new building for the Cornell Law School. President, Livingston Farrand, LL.D.

**CORPS.** See ARMIES AND ARMY ORGANIZATION.

**CORRESPONDENCE STUDY.** See EDUCATION IN THE UNITED STATES.

**CORTISSOZ, ROYAL** (?- ). An American journalist, born in New York City. For many years he was literary and art director of the *New York Tribune* and its successor the *New York Herald-Tribune*; was a frequent contributor to magazines on art subjects and also lectured much on art. He was the author of *Augustus St. Gaudens* (1907); *John LaFarge* (1911); *Art and Common Sense* (1913); *Life of Whitelaw Reid* (1921); *Nine Holes of Golf* (1922); *American Artists* (1923); and *Personalities in Art* (1925). He edited many classics, including *Don Quixote* and *The Autobiography of Benvenuto Cellini*. He also edited Whitelaw Reid's *American and English Studies*.

**CORTOT, ALFRED** (1877- ). An eminent French pianist and conductor, born at Nyon, Switzerland. He studied at the Paris Conservatoire under Decambes, Rouquou, and Diémer, graduating in 1896 as winner of the first prize. The same year, he made his début in Paris, playing the Beethoven C minor concerto at one of the Colonne concerts. From 1898 to 1901, he was at Bayreuth, studying Wagner's works with J. Kniese and acting as repertor at the festivals. Returning to Paris, he placed emphasis upon the works of Wagner, conducting the first performance in France of *Götterdämmerung* (Théâtre du Château d'Eau, May 17, 1902) and establishing the Association de Concerts A. Cortot. In 1904 he became conductor of the Société Nationale and also became a champion of contemporary French composers. The next year he formed a trio with Jacques Thibaud and Pablo Casals, which immediately won international fame. In 1907 he was appointed professor of piano at the Conservatoire, succeeding Raoul Pugno. Shortly after that he began extensive concert tours of Europe, securely establishing his position among the foremost pianists of the present day. His success at his American début (New York, 1918) was so emphatic that he has become an annual visitor. In 1923 the Royal Philharmonic Society of London awarded to him its much-coveted Gold Medal, an honor bestowed on only one Frenchman before him, Gounod. He is the author of *Principes rationnels de la technique pianistique* (1928).

**COSGRAVE, WILLIAM THOMAS** (1880- ). An Irish statesman, born at Dublin. He was educated at the Christian Brothers' Schools, and, engaging in business in Dublin, amassed a fortune. He was a member of the secret revolutionary organization called the Irish Republican



Brotherhood and a leader in the Sinn Fein ranks, and on May 5, 1916, he was arrested, brought to trial, and sentenced to death. His sentence was changed to imprisonment for life, but he was released in the general amnesty of 1917. In the fall of 1917, he was elected to Parliament, but because of his Sinn Fein principles, did not take his seat. In May, 1918, he was again arrested and taken to England. He returned in 1919, was again arrested and deported. Upon his return to Dublin this last time, he became Minister of Local Government in the Dail Eireann. In January, 1922, he put through a plan to spend £1,000,000 on housing within the year. On the death of Arthur Griffith and of Michael Collins, Cosgrave became head of the Provisional Government and when the Irish Free State was constituted in December, 1922, was elected president of the Executive Council. He was also Minister of Finance (1922-23) and Minister of Defense, 1924. Cosgrave favored financial help for the peasants so that they might change their status from tenants to peasant proprietors. He represented the Irish Free State at Geneva when it was admitted to the League of Nations (1923). The entrance of the de Valera republicans into the Dail in 1927 reduced his majority to one and a new election was held in which he retained power by a small margin. See IRELAND, under *History*.

**COSMIC RAYS.** See **PHYSICS**.

**COSMOGONY.** See **ASTRONOMY**.

**COSRIO, MANUEL BARTOLOME** (1858- ).

A Spanish humanist, art critic, and educator. Born in Haro (Logroño), he studied law and earned his doctorate at the University of Madrid. He was professor of the theory and history of art in the School of Fine Arts at Barcelona; professor of pedagogy in the University of Madrid; director of the National Pedagogical Museum of Madrid; professor in the School of Criminology; and director of the Institución Libre de Enseñanza. His study, *El Greco* (2 vols., 1908), is his most important work.

**COSTA RICA**, kō's'tā rēk'ā. A Central American republic situated between Nicaragua and Panama. Its area is variously estimated at 18,691 to 23,000 square miles. According to the census of 1927, the population was 471,524. Immigration in 1926 was 6402 (1911, 9537) and the emigration, 5894 (1911, 8170). The populations of the largest cities, according to the census of 1927, were: San José, with suburbs, 50,580; Cartago, 14,883; Heredia, 7631; Alajuela, 8496; Limón, 15,624.

**Industry and Finance.** Agriculture continues to prosper. In 1913 exports of coffee totaled 13,019,059 kilos, at a value of \$3,605,930; in 1927, 35,539,000 pounds, at \$10,611,000. In 1913 Great Britain took 82 per cent of the total; the United States, 6 per cent. During the World War, the United States displaced Great Britain from her commanding position, only to be compelled to yield up first place once more in 1922, when she bought 34 per cent, and Great Britain, 59. The banana industry, worked for the most part by the United Fruit Company, ranked second in importance in point of export value. In 1912 the number of bunches shipped was 10,647,702; in 1927, 7,853,000. Production was decreased somewhat after 1923 by blight. Cacao production has assumed economic importance. Exports in 1913 were 845,931 pounds; in 1927, 7,544,000. Mining, on the other hand, decreased because of the exhaustion of the known

ore bodies. Exports of gold and silver bullion for 1905-14 were worth an annual average of \$706,457; in 1927, \$506,000. Commerce over the whole period showed imports of \$8,687,280 for 1913; for 1927, \$16,311,000; exports for 1913 and 1927, \$10,234,149 and \$18,058,000. In 1912, 46 per cent of the imports came from the United States; in 1927, 50.3 per cent. Exports to the United States decreased from 55 per cent to 32.9 per cent in 1927. They had reached 68 per cent in 1921. The year 1922 was the first to show a surplus since 1912. Expenditures in 1913 were 10,184,261 colones; in 1922, 17,311,165 colones, in 1927, 23,319,189 colones. Revenues for the same years were 9,612,533, 18,971,023, and 30,584,123 colones. On Dec. 31, 1927, the public debt was 80,047,942 colones. The par value of the colon is \$0.465 (2.15 colones to the dollar). In 1922 the colon was worth 4.4 to the dollar, so that the Government was compelled to fix the legal rate of exchange, in October, 1922, at 4 colones. During 1923 there was a fluctuation in value, the colon going as high as 4.54 to the dollar, but the exceptionally good coffee crop and high prices of 1924 increased the gold exchange and made possible the regulation of the rate at 4 colones again. It remained stable at that rate down through 1928.

**History.** President Alfredo González, elected in 1914, was confronted by serious disturbances in 1917 on his attempt to inaugurate a radical financial programme and was compelled to relinquish his office. His successor, Federico Tinoco, leader of the revolutionists, was refused the recognition of the United States, with the result that his waning influence ended with his overthrow in 1919 at the hands of Julio Acosta García. The latter served as President, 1920-24, and during his administration the country regained the stability for which it had formerly been celebrated in Spanish America. Under a small and satisfied landowning class, prosperity prevailed. In 1917 Costa Rica severed relations with Germany and in 1918 assumed the rôle of an Associate Power on the side of the Allies. In 1920 the suffrage was extended to women. In 1921 the administration was thwarted in its attempt to join the newly-formed Central American Union by the negative vote of the National Assembly. (See **CENTRAL AMERICAN UNION**). In August, 1921, Costa Rica came near to open hostilities with Panama when that country refused to recognize an arbitral award of disputed territory to Costa Rica. In 1923 Secretary of State Hughes announced that it was the intention of the United States to recognize Costa Rica's rights in the use of the San Juan River for the Nicaraguan Canal route. The question had arisen out of Costa Rica's protest against the Bryan-Chamorro Treaty of 1916 and her subsequent suit before the Central American Court of Justice, on the ground that the route, in being run through the San Juan River, alienated her territorial rights. For the presidential term 1924-28, Ricardo Jiménez was elected in May, 1924. His administration saw continued growth in prosperity for the country, enabling it to reduce materially its foreign debt; establish a farm loan bank, build sewerage systems for many towns, build roads, bridges, etc., and improve schools. In 1928 Cleto Gonzales Viquez, leader of the National Party, was elected President for the term beginning May 8. He had been President once before, from 1906 to 1910. On Jan. 22, 1925, Costa Rica gave notice of with-

drawal from the League of Nations. According to report, she was offended at criticism for failure to pay her dues. Full payment of all dues accompanied the withdrawal notice. In 1928 a note from the League urged that Costa Rica should again become a member. In reply Costa Rica attracted world attention by requesting a definition of the Monroe Doctrine. In September, 1928, it was announced that Costa Rica had decided to rejoin the League.

**COSTIGAN, JOHN EDWARD** (1888- ). An American figure and landscape painter, born at Providence, R. I., and self-taught in art. He was awarded the Peterson Purchase Prize of the Chicago Art Institute in 1922, the Kremer Purchase Prize of the International Water Color Exposition in 1923, the Shaw \$1000 Purchase Prize of the Salmagundi Club (N. Y.) in 1924, the Tuthill Purchase Prize of the International Water Color Exhibition at the Chicago Art Institute in 1924, the National Arts Club Prize (N. Y.) in 1925, the Saltus Medal of the National Academy of Design in 1925, and the Clark \$300 Prize of the National Academy of Design in 1927. He became an associate of the National Academy in 1924.

**COST OF LIVING IN THE UNITED STATES.** The cost-of-living index numbers given by the United States Bureau of Labor Statistics show the changes in the cost of living throughout the United States during 1914-28 in comparison with the average cost in 1913. Retail prices of food are secured directly from 15 to 25 dealers in each of 51 cities and prices are also secured for coal, wood, gas, electricity, and kerosene from dealers in a number of cities. Other data on retail prices are secured by special agents. Rental figures are for 400 to 2000 houses and apartments in each city, according to its population. The costs of clothing, furniture, and miscellaneous items are determined from four quotations from each city on each of a large number of items; in Greater New York, five quotations were secured instead of four. In the calculation of the index number, the prices for the different articles of food are weighed according to the relative values shown in the budgets of over 12,000 families examined by the Federal Bureau of Labor Statistics in 1918-19.

As compared with the average for 1913 as 100.0, the cost of living for the whole United States varied widely for the period being reviewed. In December, 1916, the index had reached 118.3; a year later, it was 142.4; in December, 1918, it was 174.4. The high point was reached in June, 1920, when the index was 216.5. From thence on, the index receded slowly, dropping to 180.4 in May, 1921, and to 166.3 in September, 1922. Between that month and June, 1923, the range was never wide, being from 168.8 for March, 1923, to 175.6 for December, 1926. In June, 1923, the index was 170.0, and in December, 1923, 171. Over the period, June, 1920-December, 1928, the decrease averaged 20.9 per cent. In some cities, the decrease was even greater. In Detroit, it was 24.8 per cent; in Kansas City, 26.3 per cent; in Portland, Oreg., 24 per cent; in Savannah, 24 per cent.

The tables on pages 400 and 401 show that there were marked differences in the rates of increase in the six budget divisions. Over 1913 the cost of food increased 26 per cent in 1916 and 78 per cent in 1920. By December, 1921, the increase had dropped to 49.9 per cent only

to mount again slowly to 66.5 per cent in December, 1925. In June, 1928, food cost 52.6 per cent more than it had in 1913. Clothing showed even greater variations. In December, 1918, clothing cost 105.3 per cent more than it had in 1913; in December, 1920, it cost 158.5 per cent; and then the cost of clothing began to drop sharply, so that by June, 1923, the increase over 1913 was only 62.6 per cent. The cost of housing showed the same wide fluctuations, in December, 1920, being 51.1 per cent greater than in 1913 and a year later, 61.4 per cent. This item of the household budget mounted until it reached 68.2 per cent in December, 1924, only to recede slightly in the following years; so that, with the renewal of building activities, the increase in June, 1928, over the 1913 figure was 57.6 per cent. It will be observed by reference to the table that the trend of costs for fuel and light showed something of the same variations as in the case of housing.

In addition to the cost-of-living index number for the United States, the Bureau of Labor Statistics published data on the change in the cost of living in 19 cities where comparison could be made with prices prevailing in December, 1914. Each of these index numbers is weighed according to the proportionate expenditures for the different budget divisions shown by the budgets collected in the city by the Bureau during 1918-19. The food expenditure, however, is weighed according to the average expenditure shown in all budgets collected in the geographical division in which the city is located. As will be seen by reference to the accompanying table, there is considerable variation among the cities in the amount of change in the total cost of living. In all instances, living costs increased slowly at first and then more rapidly, until the highest point was reached in June, 1920. The decrease was fairly rapid until 1922 and from thence on the fluctuations were within a fairly narrow range. It is interesting to observe the differences existing among the individual cities in June, 1928. Buffalo appeared the most expensive city to live in, with Detroit, Cleveland, and Philadelphia following. Portland, Oreg., was the cheapest. In fact, on the basis of increases over 1914, the cost of living in Buffalo was more than 50 per cent greater than in Portland.

It is interesting to compare the trend in the cost of living in the United States with costs in various foreign countries since 1913. The index numbers are based upon the cost of food, clothing, fuel and light, rent, house furnishings, etc., with certain variations. These data, presented in Table II on page 401, show that while the cost of living in the United States and in Ireland rose in the same ratio—from 100 in 1913 to 170 in June, 1928—the increase was considerably less in Canada and Germany and much greater in Finland, Czechoslovakia, Italy, and France. In Finland, the cost of living increased from 100 in 1913 to 1212 in June, 1928; in Prague, capital of Czechoslovakia, from 100 to 736; in Milan, Italy, from 100 to 526; in Paris, France, from 100 to 507. The index figure for Denmark was 176 in June, 1928, and for Belgium, 204. The cost of living reached its peak in the United States, Canada, and Denmark in 1920, but continued to rise in most of the other European countries until 1926 or 1927. See also **WAGES**.

# COST OF LIVING

400

# COST OF LIVING

## CHANGES IN COST OF LIVING IN THE UNITED STATES FROM DEC., 1918, TO DEC., 1928

UNITED STATES BUREAU OF LABOR STATISTICS

Percentage of increase from 1918 (average) to June, 1928

TABLE I

Item of Expenditure	Dec. 1914	Dec. 1915	Dec. 1916	Dec. 1917	Dec. 1918	Dec. 1919	June 1920	Dec. 1920	Dec. 1921	Dec. 1922	Dec. 1923	Dec. 1924	Dec. 1925	Dec. 1926	Dec. 1927	June 1928	Dec. 1928
Food	5.0	5.0	26.0	57.0	87.0	97.0	119.0	78.0	49.9	46.6	50.3	51.5	66.5	61.8	55.9	52.6	55.8
Clothing	1.0	4.7	20.0	49.1	105.3	168.7	187.5	158.5	84.4	71.5	76.3	71.3	69.4	66.7	62.9	62.6	61.9
Housing	*	1.5	2.3	.1	9.2	25.3	84.9	51.1	61.4	61.9	66.5	68.2	67.1	64.2	60.2	57.6	55.9
Fuel and light	1.0	1.0	8.4	24.1	47.9	56.8	71.9	94.9	81.1	86.4	84.0	80.5	86.9	88.3	83.2	77.2	81.3
House-furnishing goods	4.0	10.6	27.8	50.6	119.6	163.5	192.7	185.4	118.0	108.2	122.4	116.0	114.3	107.7	104.6	101.1	99.7
Miscellaneous	3.0	7.4	13.3	40.5	65.8	90.2	101.4	108.2	106.8	100.5	101.7	101.7	103.5	103.9	105.1	105.5	107.1
All items	3.0	5.1	18.3	42.4	74.4	99.3	116.5	100.4	74.3	69.5	78.2	72.5	77.9	75.6	72.0	70.0	71.3

\* No change

## CHANGES IN COST OF LIVING IN 19 CITIES FROM DEC., 1914, TO DEC., 1928

Percentage of increase in cost of all items from December, 1914, to June, 1928

City	Dec. 1915	Dec. 1916	Dec. 1917	Dec. 1918	Dec. 1919	June 1920	Dec. 1920	Dec. 1921	Dec. 1922	Dec. 1923	Dec. 1924	Dec. 1925	Dec. 1926	Dec. 1927	June 1928	Dec. 1928
Baltimore	1.6	1.4	18.5	51.3	84.7	98.4	114.3	96.8	73.2	70.9	74.8	81.2	78.6	74.5	73.7	73.9
Boston	1.6	15.7	38.1	70.6	92.3	110.7	97.4	70.2	65.1	69.4	67.3	74.7	71.9	69.5	64.8	68.2
Buffalo	8.5	24.4	51.1	80.9	102.7	121.5	101.7	76.8	73.9	78.6	77.8	84.8	83.6	80.2	78.7	79.6
Chicago	3.0	19.5	41.8	72.2	100.6	114.6	93.3	72.3	68.0	73.7	75.3	80.6	79.0	74.3	71.5	73.1
Cleveland	1.4	19.1	42.9	71.4	98.2	120.3	107.3	78.8	72.9	79.6	78.1	82.7	81.5	79.0	76.3	75.4
Detroit	3.5	22.3	49.9	78.0	107.9	136.0	118.6	82.4	79.4	84.7	82.2	87.8	84.1	79.0	76.4	77.4
Houston	.3	16.4	44.9	75.7	101.7	112.2	104.0	73.6	68.4	70.6	70.5	74.3	70.6	67.9	64.1	66.4
Jacksonville	1.3	14.7	41.6	71.5	101.5	116.5	106.2	75.1	67.8	71.9	70.4	81.7	81.3	79.0	68.3	69.1
Los Angeles	1.9	7.7	28.9	58.0	85.3	101.7	96.7	76.4	74.5	78.8	75.4	77.4	73.2	70.6	67.4	71.0
Mobile	.4	13.8	43.2	71.4	94.5	107.0	93.3	63.6	58.8	62.6	68.9	68.5	68.1	65.5	63.5	65.7
New York	2.0	14.9	44.7	77.3	103.8	119.2	101.4	79.3	74.2	77.3	76.5	83.2	80.0	79.1	74.4	76.3
Norfolk	.6	14.7	45.2	80.7	107.0	123.2	109.0	79.2	69.9	72.4	72.1	76.4	74.6	73.4	71.5	74.1
Philadelphia	1.2	14.7	43.3	73.9	96.5	113.5	100.7	74.3	70.7	74.7	76.1	82.6	82.3	78.3	75.3	74.5
Portland, Me.	.4	13.8	38.0	72.2	91.6	107.6	93.1	69.2	64.1	66.9	66.0	70.3	69.2	67.0	63.8	66.9
Portland, Oreg.	8.1	6.1	31.2	64.2	83.7	100.4	80.3	58.3	56.1	57.8	55.8	56.9	55.1	52.8	50.0	52.4
San Francisco and Oakland	1.7	8.3	28.6	57.8	87.8	96.0	85.1	63.6	58.8	62.1	60.1	64.7	61.7	60.7	58.8	61.7
Savannah	.2	14.6	42.5	75.0	98.7	109.4	98.7	66.2	56.8	55.9	56.3	62.9	60.5	58.1	56.6	59.1
Seattle	1.0	7.4	31.1	69.9	97.7	110.5	94.1	71.5	66.7	68.5	67.8	71.7	69.1	66.9	65.8	67.1
Washington, D. C.	1.0	14.6	47.3	73.8	87.6	101.3	87.8	63.0	59.5	63.2	63.1	67.3	66.0	60.8	59.7	60.2

\* decrease † November, 1919

## CHANGES IN COST OF LIVING IN THE UNITED STATES AND VARIOUS FOREIGN COUNTRIES

TABLE II

Country	United States	Canada	Belgium	Czecho-slovakia,	Denmark	Finland	France,	Germany	Ireland	Italy,
No. of localities	32	60	59	Prague	200	21	Paris	71	200	Milan
Base period	1913	1913	1921	July, 1914	July, 1914	Jan.-June, 1914	1914	1913-14	July, 1914	Jan.-June, 1914
1913	100 <sup>a</sup>	100 <sup>a</sup>	...	...	...	...	...	...	...	...
1914	108	108	...	100	100	100	100	100	100	100
1915	105	107	...	...	116	...	...	...	...	114
1916	118	124	...	...	136	...	...	...	...	146
1917	142	143	...	...	155	...	...	...	...	197
1918	174	162	...	...	182	...	...	...	...	285
1919	199	176	...	...	211	...	238	...	...	327
1920	200	190	...	...	262	...	341	...	...	442
1921	174	161	100	...	237	1172	307	...	185	541
1922	170	157	90	...	199	1157	302	...	180	501
1923	173	159	109	690	204	1147	334	142	...	494
1924	173	156	137	707	...	1217	377	135	...	573
1925	178	160	143	703	...	1197	421	141	188	649
1926	176	157	199	735	...	1197	545	144	189	657
1927	172	157	207	784	...	1243	498	151	175	581
June 1928	170	155 <sup>c</sup>	204 <sup>b</sup>	736 <sup>c</sup>	176 <sup>b</sup>	1212 <sup>b</sup>	507 <sup>d</sup>	151 <sup>c</sup>	170 <sup>b</sup>	526 <sup>c</sup>

<sup>a</sup> All U. S. and Canada figures for December<sup>b</sup> April<sup>c</sup> May<sup>d</sup> March

COTARELO Y MORI, EMILIO (1857- ). A Spanish literary historian and critic. He studied law at the University of Oviedo, receiving the doctorate in 1877. Devoting himself at once to literary pursuits, he was elected a member of the Spanish Royal Academy of the Language, of which, a few years later, he became perpetual secretary. His specialty is the history of the drama. Among his most important publications are *El Conde de Villamediana* (1886); *Tirso de Molina* (1893); *Vida y obras de D. Enrique de Villena* (1896); *Estudios sobre el arte escénico de E. María del Rosario Fernández*; *La Tirana* (1897); *Don Ramón de la Cruz y sus obras* (1899); *Estudios de historia literaria* (1901); *Sobre el origen y desarrollo de la leyenda des los Amantes de Teruel* (1903); *Las armas de los Girones* (1903); *Bibliografía de las controversias sobre la licitud del teatro en España* (1904); and a historical novel, *El hijo del Conde-Duque* (1912).

COTTON. The cotton situation of the world, in 1929 was unsatisfactory from almost every standpoint. As a result of recent investigations new industrial uses for cotton have been developed and the quantity required for automobile tires, artificial leather, pyroxylin, which has many uses, etc., is very large. This new demand,

coupled with diminishing world supplies of cotton, has made it difficult if not impossible for spinners and weavers to keep their spindles and looms fully employed. On the other hand, the growers of cotton in many countries have been hard put to produce their crop at a profit on account of insects, diseases, unfavorable climatic, soil, and labor conditions, and in some cases, lack of adequate transportation. The maximum world's production of cotton was attained in 1926 when a crop of 27,812,000 bales was marketed. The production statistics of all countries except the United States is given in bales of 478 pounds, and for the United States, running bales which average a little more than 500 pounds each. Of this total, 17,755,000 bales, or nearly 64 per cent, was produced in the United States. In 1928 the estimated world's production of commercial cotton was 25,751,000 bales, of which 14,296,549 bales, or about 55½ per cent, was grown in the United States. Following the year 1920, there was a surplus of commercial cotton for a few crops and there was a large carry-over, but reduced production and growing demand had so drawn upon the reserve that for some purposes there was a deficient supply. This was shown in the greatly depressed condition in the spinning centres of many countries.

UNITED STATES COTTON PRODUCTION 1926-1928  
COTTON GINNED FROM THE CROPS OF 1926, 1927, AND 1928  
(Linters are not included)

United States	Running Bales (counting round as half bales)			Equivalent 500-pound bales		
	1928	1927	1926	1928	1927	1926
	14,296,549	12,733,112	17,755,070	14,477,874	12,956,043	17,977,874
Alabama	1,096,624	1,173,430	1,470,404	1,109,126	1,193,392	1,497,821
Arizona	145,781	90,281	120,089	149,458	91,656	122,902
Arkansas	1,216,241	979,481	1,513,382	1,245,982	999,983	1,547,932
California	171,042	89,998	128,835	172,280	91,177	131,211
Florida	20,053	17,361	33,231	19,203	16,496	31,954
Georgia	1,053,205	1,111,399	1,498,473	1,029,499	1,100,040	1,496,105
Louisiana	685,868	543,153	826,179	690,958	548,026	829,407
Mississippi	1,462,021	1,348,489	1,857,525	1,474,875	1,355,252	1,887,787
Missouri	146,921	116,024	215,769	146,909	114,584	217,859
New Mexico	82,177	64,920	70,206	83,544	65,294	71,000
North Carolina	869,248	879,677	1,246,754	886,474	861,468	1,212,819
Oklahoma	1,187,042	1,009,626	1,760,644	1,204,825	1,037,141	1,772,784
South Carolina	744,390	738,550	1,025,991	726,039	730,013	1,008,068
Tennessee	423,471	355,975	442,052	429,284	359,059	451,538
Texas	4,941,545	4,229,387	5,477,788	5,109,939	4,356,277	5,630,881
Virginia	44,764	30,705	51,391	43,711	30,609	51,829
All other states*	6,206	6,676	15,857	6,018	6,576	16,032

\* Includes Illinois, Kansas, and Kentucky

**Boll Weevil and Pink Bollworm.** In certain parts of the United States, the reduced production was due to a number of causes, the principal of which is the boll weevil, *Anthonomus grandis*. The boll weevil, which is a native of Central America and Mexico, made its appearance near Brownsville, Tex., about 1892. It advanced toward the north and east at an average rate of about 100 miles a year until in 1923 practically all the old cotton belt from Texas and Oklahoma to North Carolina was infested. So severe were its ravages that the production of upland cotton was greatly curtailed and the crop of Sea Island cotton was reduced from a maximum of 119,000 bales in 1911 to less than 1000 bales in 1923. For several years, no commercial Sea Island cotton has been produced in the United States. The presence of the boll weevil necessitated the adoption of modified methods of growing the crop that materially increased its cost. Early maturing varieties are more extensively grown, and heavy applications of fertilizers are recommended to hasten the maturity of the crop. Poisoning the weevils with calicum arsenate has been extensively adopted and more than 1,000,000 pounds of this material were employed in 1923. Where the land is sufficiently fertile to produce at least half a bale to the acre, the use of calicum arsenate has proved very profitable. Dusting from airplanes has been successfully developed. By the combination of these methods, it has been found entirely practicable to grow cotton in regions of heavy boll-weevil infestation.

The pink bollworm, *Pectinophora gossypiella*, a serious menace to cotton growing, appeared about 1916 in Louisiana and Texas, having probably been introduced from Mexico. It was eradicated by 1918 through cleaning all fields, gins, and seed mills, and by the establishment, surrounding the infested areas, of zones in which no cotton was grown. In 1927 it again was found in west-central Texas and the same measures have been put in force for its control. In the meantime, the pink bollworm has become established in the Lower Rio Grande Valley in New Mexico, where it is a menace to cotton growing in other districts. Quarantine measures have been adopted to prevent its spread. See *ENTOMOLOGY, ECONOMIC*.

**Distribution of Production.** There was a very considerable extension of the cotton area of the United States after 1914. Arizona and California became important producers of cotton, with a production in 1923 of more than 132,000 bales. In Arizona, the industry was largely built up around strains of Egyptian cotton, and in 1920 the production of Egyptian-American cotton was in excess of 100,000 bales. This cotton is of a special type, having very long and fine lint, and it is suited to special manufactures. The overproduction in 1920 resulted in a fall in price and a reduced planting of these varieties. In 1927 only 24,223 bales of this type of cotton were grown, while there was a decided increase of short-staple cotton both in Arizona and in California.

There has been a remarkable extension of cotton growing in the plateau region of northwestern Texas. Extension areas suited to the crop, large fields that permit of machine cultivation, mechanical methods of harvesting, and freedom from boll-weevil injury, all favor cotton production in this region. In 1927 in 13 counties of northwestern Texas, over 150,000 bales

of cotton were produced where there was no commercial crop of cotton in 1922.

In Egypt, one of the great cotton-producing countries, there was a steady decline in the yield of cotton per acre, and although there was a large area brought under cultivation by the construction of the great Assuan Dam, the total production of cotton showed little increase. Several commissions studied the situation and the reduced production per acre was attributed to various causes, among them changed cultural methods, rise of water table due to overirrigation, extensive planting of varieties of low production but yielding fine lint, and the spread of pests, especially the pink bollworm. The Egyptian government limits the area to be planted in cotton, supervises the crop, its marketing, etc.

For many years, Great Britain has been the greatest consumer of cotton, about 35 per cent of all the spindles devoted to cotton spinning being in that kingdom. In order to make English spinners less dependent upon the United States for supplies of cotton, an active campaign was started to increase the growing of cotton within the British Empire. In 1902 there was organized the British Cotton Growing Association. In 1919 the Empire Cotton Growing Corporation was chartered and supported by contributions from the Government and by a tax of 6d. per bale on all cotton imported into and spun in the United Kingdom. Through the activities of these organizations, the growing of cotton has been stimulated in many parts of the British Empire. In some countries, subsidies have been granted to growers, gins have been erected, experiment stations and seed farms established, and irrigation works constructed, all with a view to increasing cotton production. While no large amounts of cotton were added to the world's production, the possibilities of successful cotton growing in some countries seemed assured. Empire-grown cotton, exclusive of India, in 1926-27 amounted to 361,318 bales, as compared with 84,522 bales in 1918-19. Parts of Africa, particularly the Sudan, Uganda, and Nigeria, were considered very promising. In Australia, the climate and soils appeared favorable, and it was believed a profitable industry could be built up. Efforts were being made to improve the cotton situation in India, and a fund derived from a tax of 4 annas (about \$.08.) a bale on all cotton grown in the country was devoted to research in the cotton industry. This tax was reduced to 2 annas in 1926. Brazil had a 1927 crop estimated at 492,000 bales. An international commission visited Brazil in 1922 and reported favorably on the possibilities for cotton growing and suggested means whereby production might be greatly increased.

Although active efforts were made by European agencies to increase the production of cotton in order that there might be larger supplies for the old spinning centres, there has been a rapid expansion of spinning in new territories and it is considered doubtful whether the desired object will be attained. Japan, reporting more than 6,200,000 spindles in 1928, became an important consumer of raw cotton. In Brazil, as cotton production has increased, manufacturing it into yarn and cloth has grown. India is consuming more of its crop in domestic manufactures and the exports are not increasing very appreciably.



In February, 1924, there were in the United States 37,742,000 spindles, an increase of about 15 per cent since 1914, indicating a material increase in cotton consumption within the country. In February, 1929, there were in place 35,327,824 spindles, of which 31,007,936 were active. There was a decided movement of cotton spinning toward the cotton-growing States, and while there were still about 2,000,000 spindles more in the Northern than in the Southern States, the number of active spindles and spindle-hours per month in the cotton-growing States were greater in the South in February, 1924. In February, 1929, however, there were in the cotton-growing States 18,713,214 spindles, as compared with 15,118,014 for New England and 1,486,596 for other States. See TEXTILE MANUFACTURING.

**COTTON, HENRY ANDREWS** (1869- ). An American psychiatrist widely known in connection with the relief of certain forms of insanity through surgical intervention. Born in Norfolk, Va., he graduated at the Baltimore Polytechnic Institute in 1894 and took his medical degree at the University of Maryland in 1899. He studied psychiatry in Europe during 1905-07 in the laboratories of Professors Kraepelin and Alzheimer, at Munich. Upon his return, he was placed at the head of the New Jersey State Insane Asylum where he studied the relation of physical factors to the causation of mental disorders. In 1921 he delivered a course of lectures at Princeton on the relation of focal infection to insanity. His views and experience are set down in his book, *The Defective, Delinquent, and Insane* (1921).

**COTTON, JOSEPH POTTER** (1875- ). An American lawyer, born at Newport, R. I. He was graduated from Harvard in 1896 and from the Harvard Law School in 1900. After 1915, he served as counsel to the New York Commission on Workmen's Compensation, and was consulting counsel of the Federal Reserve Board and of the United States Shipping Board. He was chief of the meat division, United States Food Administration, in December, 1917, and in the following year was European representative of the Federal Food Administration. He was also a member of the Inter-Allied Finance Council. In 1929 he was appointed Under Secretary of State. He edited *Constitutional Decisions of John Marshall* (1906).

**COTTON, MANUFACTURES OF.** See TEXTILE MANUFACTURING; also COTTON, above.

**COTTON-BOLL WEEVIL.** See ENTOMOLOGY, ECONOMIC.

**COTTRELL, FREDERICK GARDNER** (1877- ). An American chemist (see VOL. VI). During 1920-21 he was director of the United States Bureau of Mines, and also chairman of the Division of Chemistry and Chemical Technology of the National Research Council. Since 1922 he has directed the Fixed Nitrogen Research Laboratory, U. S. Department of Agriculture.

**COTTRELL PROCESS.** The Cottrell process for precipitating fine particles of solid matter in smoke, gases, and furnace fumes is very widely applied in American metallurgical plants. It recovers material of very great value, as in metal smelters, and greatly reduces smoke and fumes exhausted from chimneys. The process consists of passing the fumes between two conductors maintained at a unidirectional difference of potential of from 50,000 to 100,000 volts.

For this purpose, high potential alternating voltages are rectified by means of a mechanical rectifier or more recently by means of a hot cathode two-electrode vacuum tube known as a kenotron.

**COUÉ KOU'À, ÉMILE** (1857-1926). A French mental healer and hypnotist, born at Troyes, France. At 19, he became an apprentice in a pharmacy, and at the end of three years went to Paris and took his Ph.D. in Pharmacy, helping to pay his way by winning a competition for a government fellowship of 1200 francs a year. Later, a druggist at Troyes offered him a partnership, and when the druggist died shortly thereafter, he left the store to his young partner. Coué became a hypnotist, then an auto-suggestionist, and had a sanitarium where he practiced without charge to his patients. After a somewhat sensational career in France and England, he came to the United States early in 1923 and held many clinics in New York City and throughout the country. Coué's theory was that the subconscious mind, trained by repeating many times each day: "Every day in every way I am getting better and better," will direct the diseased organ to do the thing that will make it better. He described his theories and methods in a book entitled, in the English translation, *Self-Mastery by Conscious Autosuggestion*.

**COULTER, JOHN LEE** (1881- ). An American statistician and college president (see VOL. VI). During 1917 and 1918, he was an expert for the National Exports Council and the War Industries Board. He was with the Army Overseas Educational Commission during 1918 and 1919. Since 1921 he has been president of the North Dakota Agricultural and Mechanical College.

**COULTER, JOHN MERLE** (1851-1928). An American botanist (see VOL. VI). Professor Coulter remained head of the department of botany of the University of Chicago until 1925. For the last three years of his life, he was adviser to the Boyce Thompson Institute of Plant Research at Yonkers, N. Y. and during 1923-28 he was a member of the National Research Council. He wrote *Plant Genetics* (1918), and (with Merle C. Coulter), *Where Evolution and Religion Meet* (1924).

**COULTON, KÖL-TÜN, GEORGE GORDON** (1858- ). A British historian who was university lecturer in English at Cambridge. He was educated at the Lycée Impérial, St. Omer, Felstead School, St. Catharine's College, Cambridge, and at Heidelberg, and after being assistant master at Sherborne, Sedbergh, and Dulwich, he became Birbeck Lecturer in ecclesiastical history at Trinity College, Cambridge. He was a Fellow of St. John's College, Cambridge, and an honorary Fellow of St. Catharine's. His books, written in a brilliant and appealing style, include *Chaucer and his England* (1908); *The Main Illusions of Pacifism* (1916); *The Case for Compulsory Military Service* (1917); *Social Life in Great Britain from the Conquest to the Reformation* (1918); *Five Centuries of Religion*, the 11th to the 16th: Vol. I, *St. Bernard* (1923), Vol. II, *Tradition* (1927); *The Death Penalty for Heresy from 1184 to 1921 A.D.* (1924); *The Medieval Village* (1925), and *Art and the Reformation* (1928). He edited *Cambridge Studies in Medieval Life and Thought*, writing two studies himself: *The Monastic Legend* (1905) and *Priests and People* (1907), and he also edited *Democracy and Military Service* which

was an abbreviated translation of the *Armée Nouvelle*, by Jean Jaurès (1916).

**COUNTY, ALBERT JOHN** (1871- ). An American railway official, born in Dublin, Ireland. He entered the railway service with the Great Southern & Western Railway of Ireland, in 1885. Removing to the United States, he became clerk in the secretary's department of the Pennsylvania Railroad, and in the years following served in various important capacities with that road and with its subsidiary lines. In 1916 he was appointed vice president in charge of accounting and in 1925 vice president in charge of the treasury and corporate work of the Pennsylvania and affiliated roads. He was also director and president of most of the branch and affiliated lines of the Pennsylvania Railroad Company, an official and director in many important financial institutions and a member of many learned societies.

**COUPERUS, LOUIS** (1863-1923). A Dutch novelist, born at The Hague, where he was educated. His youth was spent in Batavia, Greece, Italy, and the South of France. His publications began to make an impression in foreign countries as early as 1891, when *The Footsteps of Fate* was published in England. His first venture was a volume of verse, *Ben Lent van Vaerzen* (1884), but after the publication of *Orchideeën* (1887), he wrote only fiction. The first to be rendered into English by the official translator of his works, Alexander Teixeira de Mattos, was a short love story entitled *Ecstasy* (1891), which appeared in the United States in 1919. This was followed by English versions of *Majesty*; *Universal Peace*; *Psyche*; *Fidessa*; *Babel*; *God and the Gods*; and a series of four novels entitled "Books of the Small Souls" (1914-18), namely, *Small Souls*; *The Later Life*; *The Twilight of the Souls*; and *Dr. Adriaan*. He also published at intervals historical novels which reflected his researches in the Greek and the Italian past, including *The Mountain Light*, a study of the emperor Heliogabalus, and *The Comedians* (*De Komodianten*, 1906), which deals with two young actors in the reign of Domitian. Another, *The Tour*, of which the scene is laid in Egypt in the reign of Tiberius, was published in the United States in 1920. His other historical romances are *Abu-Abdallah the Unfortunate*; *The Flying Chessboard*; and *Xerxes or Pride*. He also wrote two mythological romances, *Dionysus and Heracles*; *Old People and the Things that Pass*, issued in the United States in 1919, and *The Law Inevitable* (1921). In addition, he published volumes of travelers' impressions, sketches, short stories, and a number of novels whose scenes are laid in the Dutch East Indies. After his death, *Eastwards* (1924) and *Nippon* (1926), books of travel, were published.

**COURLAND.** See BALTIC PROVINCES; LITHUANIA; LATVIA.

**COURTELINE, GEORGES** (1860- ). The pseudonym of Georges Moinaux, a French humorist, writer of novels, stories, and short plays. He was born in Tours and educated at the Collège de Meaux. He was a member of the Goncourt Academy. Among his many works are *Les gâtées de l'escadron* (1886); *Le train de 8 h. 47* (1888); *Messieurs le ronds-de-cuir* (1893); *Boubouroche*, perhaps his best work (1893); *La voiture versée* (1898); *L'Article 330* (1900); *La conversion d'Alceste*, a continuation of Molière's *Misanthrope* (1905); *La cruche . . . ou*

*j'en ai plein le dos de Margot* (1911); *Les Boulingrin* (1914), and *Une lettre chargée*. In 1918 his *Théâtre* was published in two volumes, and in 1919 *Le miroir concave*, another collection of plays. He wrote many in collaboration with others, the most famous being Catulle Mendès, with whom he wrote *Les joyeuses commères de Paris*, music by Rabuteau and Pierné (1892). Consult *Georges Courteline*, by R. Le Brun (1906) or by Beatrice Elliott (1928), the latter being selections to show the many-sidedness of his work, and *La Philosophie de Georges Courteline* (1917).

**COURTENAY, WILLIAM** (1875- ). An American actor born at Worcester, Mass., who attracted notice first as a member of the late Richard Mansfield's company. He played in various places in the United States and made his most notable recent successes in: *Under Fire* (1915); *Pals First* (1917); *General Post* (1917); *The Maid of the Mountains* (1918); *Cappy Ricks* (1919); *Civilian Clothes* (1920); and *Honors Are Even* (1921). In 1924 he played Roland Valetti in *The Harem*.

**COURT OF INDUSTRIAL RELATIONS.**

See LABOR ARBITRATION; KANSAS.

**COURT TENNIS.** See TENNIS.

**COUSE, E(ANGER) IRVING** (1866- ). An American painter (see VOL. VI) whose specialty is the portrayal of Indian life. He has won many prizes for his Indian paintings including a silver medal from the Panama-Pacific International Exposition (1915), the Altman Prize from the National Academy of Design (1916), Isidor Prize from the Salmagundi Club (1917), the Ranger Fund Purchase Prize from the National Academy of Design (1921), and the Lippincott Prize from the Pennsylvania Academy of Fine Arts (1921).

**COUZENS, JAMES** (1872- ). A United States Senator, born at Chatham, Ontario, Can., and educated in the public schools. In 1903 he began the manufacture of automobiles in Detroit, Mich., becoming closely associated with Henry Ford (q.v.) in that industry (1903-15). He was vice president, general manager, and treasurer of the Ford Motor Company. Differing sharply with Ford on issues in connection with the World War, he resigned from the organization. Having been commissioner of the Detroit police department and commissioner of street railways, he was elected Mayor of Detroit (1919-22). Appointed by Governor Groesbeck to complete the unexpired term of Truman S. Newberry as United States Senator (1922-25), he was elected for the succeeding term (1925-31). He has been chairman of the Senate Committee on Education and Labor and a member of the Interstate Commerce Committee.

**GOVENEY, CHARLES CARDEN** (1874- ). An American architect born in Boston. He received his professional training in an architect's office and during travel in Europe. His principal architectural achievements are the Christian Science Church and the Burrage residence in Boston, the Memorial Church in Fairhaven, Mass., and the Messiah Home in New York. He has specialized in church architecture and has been an active worker in the Protestant Episcopal Church.

**COWARD, NOEL** (1899- ). A British actor, playwright, and composer, who was born at Teddington, England. At ten he left Croydon School to begin his career as an actor in a village fairy play. By 1917 he had written *The*

*Last Track*, and was acting his first important part. After serving in the army (1918), he played Bobbie in *I'll Leave It To You*, his first successful play (1920), and the next year made a trip to America, where his efforts to market his three plays were in vain. In London, *Young Idea* was a success, as were his sketches for revues, notably *Charlot's*, as well as his acting in this field. London producers were eager to stage *The Vortex*, written in five days, but not with the author in the part of Nicky Lancaster—so, financed by Michael Arlen, Coward played and produced it successfully (1924), and brought it to New York (1925). Also produced in New York were *Hay Fever*, a failure (1925), *Easy Virtue* (1925), *This Was a Man* (1926), *Fallen Angels* (1927), *The Marquise* (1927), and *This Year of Grace*, a musical revue, starring Beatrice Lillie and the author (1928). Other plays, produced only in London, were *The Rat Trap*, *On With the Dance*, a revue, *The Queen Was in the Parlour*, *Home Chat*, and *Sirocco*, a complete failure. On the whole, his dialogue is clever, his instinct for effect good, and there is continual action in his plays.

**COWL, JANE** (maiden name Cowles) (1887- ). An American actress, born in Boston. She began her stage career as an extra girl, one of her early small parts being in *The Music Master*. She had her first big leading rôle in David Belasco's production, *Is Matrimony a Failure*, and then she played stock. This was followed by *The Gamblers*, her first great success, and by *Within the Law*, *Common Clay*, and other successes. She turned her attention to playwriting also, and wrote *Daybreak* with Jane Murfin, then *Lilac Time and Information, Please*. Her most notable triumph has been *Juliet*, in *Romeo and Juliet*, which she played in 1923 and 1924. She began to study this rôle when she was 13, and her interpretation of her part was given great praise. She appeared also in *Peléeas and Mélisande*, in *Antony and Cleopatra* (1923); in Noel Coward's *Easy Virtue* (in the United States and England, 1925-26); and in *The Road to Rome* (1927-28).

**COWLEY, ARTHUR ERNEST** (1861- ). An English Hebrew scholar (see VOL VI). He was made librarian of the Bodleian Library, Oxford, in 1919. His later works included *Jewish Documents of the Time of Ezra* (1919); *The Hittites* (1920); *Aramaic Papyri of the 5th Century B. C.* (1923); and *Catalogue of Hebrew Printed Books in the Bodleian Library* (1928).

**COWLING, DONALD JOHN** (1880- ). An American university professor and college president, born at Trevalga, Cornwall, England. He was brought to America by his parents in 1882 and was educated at Lebanon Valley College, Yale and Baker universities. He received the honorary LL.D. degree from Knox, Williams, and Oberlin colleges. After teaching philosophy at Baker University, he became, in 1909, president of Carleton College. Dr. Cowling was a leader in religious education, and was trustee of the Congregational Foundation for Education and of the Chicago Theological Seminary. In 1918 he was president of the Association of American Colleges and in 1919 served on the American Council on Education.

**COWS.** See DAIRYING; LIVE STOCK; VETERINARY MEDICINE.

**COX, HAROLD** (1859- ). An English editor and economist (see VOL VI). He was a member of the Committee on Public Retrench-

ment (1916), and of the Royal Commission on Decimal Currency (1919). He published *Economic Liberty* in 1920, and *The Problem of Population* in 1923.

**COX, JAMES M (IDDLETON)** (1870- ). An American governor and newspaper publisher (see VOL VI). He was Governor of Ohio for the terms 1913-15, 1917-19, and 1919-21. In 1920, he was Democratic nominee for President of the United States, but was defeated by the Republican candidate, Warren G. Harding. He bought the Miami *Metropolis* (Miami, Fla.) and the Canton *News*, Canton, O., in 1923.

**COX, SIR PERCY ZACHARIAH** (1864- ). A British diplomat and colonial administrator, who was educated at Harrow and Sandhurst. After a few years in the British Army, he was appointed to the Indian political department, and acted as consul on the Somali Coast, at Berbera, in Arabia, and on the Persian Gulf. He was secretary of the foreign department of the Government of India in 1914 and acting British Minister to Persia, 1918-20. His administration of Iraq as high commissioner (1920-23) covered the transition from military rule through a provisional government to the time when Feisal, a son of the King of the Hedjaz, was made King by the British in 1921. In 1924 he was the British plenipotentiary in the negotiations over the Turko-Iraq frontier, and in 1925 he was India's plenipotentiary at the Geneva conference for framing a convention for control of the arms traffic.

**COXE, WILLIAM BRISCOM** (1869-1927). An American marine engineer, born in Reading, Pa. He received his engineering education in Germany and for several years was with a marine construction company in Scotland. He acted as foreign representative and assistant general superintendent for the Cramp Shipbuilding Company from 1898 to 1904, and built for them several large battleships for Russia and other countries. He was president and official in many shipbuilding and engineering corporations. During the Spanish-American War he served as lieutenant in the United States Navy and from 1917 to 1920 was district manager of the Emergency Fleet Corporation, Delaware River District. He was president of the Atlantic Coast Shipbuilders' Association from 1917 to 1920.

**CRACKING OF PETROLEUM.** See CHEMISTRY; PETROLEUM.

**CRAFTS, WILBUR FISK** (1850-1922). An American clergyman (see VOL VI). He was United States delegate to the Purity Congresses in 1915, 1916, and in the same years was a member of the Union National Commission to frame an amendment for Constitutional Prohibition. In 1917 he became a member of the Presbyterian Social Service Commission and of the United States Committee of War-time Activities. At the time of his death, he was superintendent of the International Reform Bureau at Washington, D. C. Among his later works are *The Bible in School Plans in All Lands* (1914); *Bible Stories and Poems* (1914); *Dress Reform* (1918); *Why Dry? Briefs for Prohibition, Local, State, National, and International* (1918, 1919); *Made in Mayflower Land* (1920); *That Boy and Girl of Yours, and Other Addresses* (1921).

**CRAIG, AUSTIN** (1872- ). An American historian, born at Eddytown, N. Y., and educated at Cornell University, the University of

Rochester, and Pacific University, Oreg. He was a school superintendent in Oregon from 1895 to 1898, when he began the practice of law. In 1904, he entered the Philippine Civil Service. He was assistant professor and Rizal research professor of history in the University of the Philippines, 1912-22, and professor of history in the University of Manila (1922-27). His works include *The Story of José Rizal* (1909); *Los Errores de Retana* (1910); *The Lineage, Life and Labors of José Rizal* (1912), and *The Story of the Philippine People* (1919). He also edited the following: *The Rizal Translations* (1912-14); *Pre-Spanish Philippine History, A. D. 48-1521* (1915); *The Former Philippines Through Foreign Eyes* (1915); *The Beginnings of Philippine Nationalism* (1916); *Famous Filipinos* (1916); *Rizal's Own Story* (1919); *The Filipinos' Part in the Philippines' Past* (1921); *Rizal's Life and Minor Writings* (1927).

**CRAIG, kräg, CHARLES FRANKLIN** (1872- ). An American bacteriologist (see VOL. VI). Dr. Craig was appointed curator at the Army Medical Museum in 1918, resigning to accept the chair of bacteriology, parasitology and preventive medicine at the Army Medical School, Washington, D. C. (1920-22). He served as medical inspector of the Hawaiian Department at Honolulu, 1922-26, and then returned to the Army Medical School as director of the department of preventive medicine and clinical pathology. His monograph, *The Wassermann Test*, was published in 1918. He is also the author of *A Manual of the Parasitic Protozoa of Man* (1925).

**CRAIG, EDWARD GORDON** (1872- ). An English actor (see VOL. VI). His later publications on the theatre include *The Theatre Advancing* (1921), *Scene* (1923), *Woodcuts and some Words* (1924), *Nothing, or the Book-plate* (1925), and *Books and Theatres* (1925). In 1928 he collaborated in a notable production of *Macbeth* in America.

**CRAIG, JAMES.** See CRAIGAVON, FIRST VIS-COUNT OF STORMONT.

**CRAIGAVON, FIRST VISCOUNT OF STORMONT** (1871- ). Born James Craig in County Down, Ireland, he became the first Prime Minister of Northern Ireland, an office which he has held continuously since 1921. He was educated at Merchiston and served in the South African and World Wars. Entering politics in 1903, he was elected to Parliament as an Ulster Unionist in 1906 and was returned regularly until 1921. He was parliamentary secretary to the Ministry of Pensions in 1919-20, and parliamentary and financial secretary to the Admiralty in 1920-21. He was created a baronet in 1918 and viscount in 1927. Honorary degrees were bestowed upon him by Queens University, Belfast (LL.D., 1922), and Oxford (D. C. L., 1926).

**CRAIGIE, SIR WILLIAM A.** (1867- ). A British philologist, born in Dundee, Scotland, who has been joint editor of the English Oxford Dictionary since 1901. After studying at St. Andrews University and Copenhagen, he lectured at St. Andrews and the Taylor Institution, Oxford, and was a fellow of Oriel College, Oxford, (1917-25), and Rawlinson and Bosworth Professor of Anglo-Saxon there (1916-25). He then accepted a professorship of English at the University of Chicago. He was knighted in 1928. His works include various publications on Scottish, Gaelic, and Scandinavian subjects;

*Religion of Ancient Scandinavia* (1906); *Icelandic Sagas* (1913); *The Maitland Folio Manuscript* (1910-27); *Specimens of Anglo-Saxon Prose and Poetry* (1923-25); *The Study of American English* (1927).

**CRAM, RALPH ADAMS** (1863- ). An American architect (see VOL. VI). He was the architect of the Cathedral of St. John the Divine in New York City and supervising architect of Princeton University, for which he designed the Chapel, completed in 1928. His later works included *The Substance of Gothic* (1917); *The Nemesis of Mediocrity* (1918); *The Great Thousand Years* (1918); *The Sins of the Fathers* (1919); *Walled Towns* (1919); *Gold, Frankincense, and Myrrh* (1919), and *Towards the Great Peace* (1922).

**CRAMER, JOHN LUTHER** (1871- ). An American railway official, born in Burlington, Iowa. He was educated in the schools of that city and began his railway career with the Chicago, Rock Island & Pacific Railway as clerk, in 1883. In the years immediately following, he served in various capacities with the Montana Central and other roads in the West and Northwest. From 1889 to 1902, he was auditor of the Great Northern Railway and was assistant comptroller of the Rock Island System from 1902 to 1904. From 1904 to 1911, he was vice president and comptroller of the C. H. & D. Railway Co., and from the year 1904 on, served in various offices with the Pere Marquette Railroad Company, becoming vice president and treasurer of that company in 1920.

**CRANE, CHARLES RICHARD** (1858- ). An American business man and diplomat, born at Chicago and educated in the public schools of that city. He early entered business and from 1894 to 1914 he was vice president or president of the Crane Company of Chicago. In 1917 he was a member of the President's Special Diplomatic Commission to Russia, and in 1919 was American Commissioner on Mandates in Turkey. In 1920-21 he was American Minister to China.

**CRANE, FRANK** (1861-1928). An American journalist (see VOL. VI). His recent works include: *War and World Government* (1915); *Adventures in Common Sense* (1916); *The Looking Glass* (1917); *Christmas and the Year Round* (1917); *Dr. Frank Crane's Opinion of Astrology* (edited by F. T. Allen, 1918); *Lighted Windows* (1918); *400 Four-Minute Essays* (10 vols., 1919); *The Crane Classics* (10 vols., 1920); *Why I am a Christian* (1924); *Everyday Wisdom* (10 vols., 1927); and *Ten Commandments* (1928). He also translated, with Arthur Crane, *Bhagavadgita*, or *The Battle of Life—the Ancient Poem of India* (1918).

**CRANE, WALTER RICHARD** (1870- ). An American mining engineer, born at Grafton, Mass. He was graduated in 1895 at the University of Kansas, took post-graduate courses there in 1896, and then studied at Columbia, obtaining his Ph.D. in 1901. In 1898, he became assistant professor of mining at Kansas and seven years later returned to Columbia, where he taught until 1908, when he accepted a call to the chair of mining at the Pennsylvania School of Mines and Metallurgy, also serving as dean. In 1918 he became mining engineer with the United States Bureau of Mines, in 1920 chief engineer of the War Minerals Relief Commission, in 1921 superintendent of the Southern Mining Experiment Station in Birmingham, Ala., and later

supervising research engineer for the Bureau of Mines. Dr. Crane also served on the United States Geological Survey during 1902-05. In addition to many other technical papers, he is author of *A Treatise on Gold and Silver* (1908), *Index of Mining Engineering Literature* (1909), and *Ore Mining Methods* (1910).

**CRANES, ELECTRIC.** See **ELECTRIC MOTORS IN INDUSTRY.**

**CRAPSEY, ALGERNON SIDNEY** (1847-1927). An American author and former Protestant Episcopal clergyman (see VOL. VI). Included among his later works are: *The Rise of the Working Class* (1914); *The Ways of the Gods* (1920); and *The Last of the Heretics* (1924).

**CRAVATH, PAUL DRENNAN** (1861- ). An American lawyer, born at Berlin Heights, Ohio. He was educated abroad and at Oberlin College, graduating in 1882. He graduated from the Law Department of Columbia University in 1886, and in the same year was admitted to the bar. He was advisory counsel to the American Mission to the Inter-Allied Council on War Purchases and Finance, in London and Paris, in 1918, and was awarded the Distinguished Service Medal for exceptionally meritorious service during the World War. He also received decorations from the French and Italian governments. He was a member of many legal and other societies.

**CRAVEN, FRANK** (1875- ). An American actor and dramatist who played in the United States until 1913, when he went to London in *Bought and Paid For*. He returned to the United States with his own play, *Too Many Cooks*, in which his acting established his reputation, and which he took to London in 1919. Other plays in which he has acted are *This Way Out* (his own play, 1917); *Going Up* (1917); *The Girl from Home* (1920); *The First Year* (his own play, 1920). In collaboration with George V. Hobart, he wrote *The Little Stranger*. He also wrote *Spite Corner* (1921) and *New Brooms* (1924).

**CRAWFORD, WILLIAM HENRY** (1855- ). An American educator (see VOL. VI). He was appointed National War Work Council secretary of the Y. M. C. A. in 1917 and was in France in 1917-18. In 1920 he resigned as president of Allegheny College, becoming president emeritus. He is the author of *The American College* (1915).

**CREDIT, COÖPERATIVE.** See **COÖPERATION.**

**CREDIT BANKS.** See **AGRICULTURAL CREDIT.**

**CREDIT UNIONS.** See **COÖPERATION.**

**CREEL, GEORGE** (1876- ). An American editor and author, born at Blackburn, Mo., and educated in the public schools. From 1899 until 1913, he was successively editor of the *Kansas City Independent*, the *Denver Post* and the *Rocky Mountain News*. In 1917-19 he was chairman of President Wilson's Committee on Public Information. His works include: *Quatrains of Christ* (1904); *Children in Bondage* (1913); *Wilson and the Issues* (1916); *Ireland's Fight for Freedom* (1919); *How We Advertised America* (1920); *The War, the World, and Wilson* (1920); *Police Commissioner Enright Replies to His Critics* (1921); *Uncle Henry*; *The People Next Door* (1926); *Sons of the Eagle* (1927); and *Sam Houston* (1928).

**CREIGHTON, JAMES EDWIN** (1861-1924). An American philosopher. Both as editor of the *Philosophical Review* and as professor at the Sage School of Philosophy (Cornell Uni-

versity), he continued to exercise a strong influence in the direction of idealism. On the occasion of the twenty-fifth anniversary of his service to philosophy, a testimonial volume of essays was published by former pupils of the Sage School (1917).

**CREWE, KRÖÖ, ROBERT OFFLEY ASHBURTON CREWE-MILNES, FIRST MARQUIS OF** (1858- ). A British diplomat and public official (see VOL. VI). He was Ambassador to Paris (1922-28). He was again lord president of the Council (1915-16), and was president of the Board of Education (1916), and chairman of the London County Council (1917).

**CREWS, LACRA HOPE** (1880- ). An American actress born in San Francisco, who made her first appearance on the stage as a child. She appeared later in stock and played with Frances Starr. Her later characterizations, which have been among her best, include Mrs. Deane in *Peter Ibbetson* (1917); Mrs. Sherman Fessenden in *On the Hiring-Line* ("The Wrong Number," 1919); The wife, in *Tea for Three* (1920); Olivia in *Mr. Pim Passes By* (1921); Dora Taber in *The Changelings* (1923).

**CRICKET.** Cricket, primarily a British sport, is attaining varied degrees of popularity throughout various dependencies of the British Empire and in the United States. International competition between teams of Great Britain and the United States, Canada and the United States, and Great Britain and Australia are becoming more frequent and attract fair-sized crowds.

**CRILE, GEORGE WASHINGTON** (1864- ). An American surgeon (see VOL. VI). Dr. Crile was very active throughout the World War and, before the participation of the United States, was at the head of the Lakeside Hospital Unit attached to the British Expeditionary Force in France. After the entry of the United States, he was again in France in the capacity of senior consultant in surgical research and was made colonel of the Medical Officers' Reserve Corps. In 1924 Dr. Crile and others founded the Cleveland Clinic Hospital, an outgrowth of the Cleveland Clinic, founded in 1921 for clinical and research activities. There he evolved his bipolar theory of living processes—the theory that an electric force builds up and maintains the form and structure of all living cells—published in 1924. He also became known as a leader in the surgical treatment of goitre. In May, 1929, the clinic was destroyed by the explosion of X-ray films stored in the basement and by fire, which followed the explosion. More than 120 occupants of the building died from the effects of poisonous gas fumes released by the explosion. Plans for rebuilding the clinic were announced. His later works included *The Origin and Nature of the Emotions* (1915); *A Mechanistic View of War and Peace* (1915); *Man as an Adaptive Mechanism* (1916); *The Kinetic Drive* (1916); *A Physical Interpretation of Shock* (1921); *Surgical Shock and the Shockless Operation*, in collaboration with Lower (1920); *A Bipolar Theory of Living Processes* (1924); and *Problems of Surgery* (1928).

**CRIME AND CRIMINOLOGY.** See **PENALOGY.**

**CRISP, ARTHUR** (1881- ). An American painter. He was born at Hamilton, Ont., and studied with Bryson Burroughs and Frank Dumond at the Art Students' League, New York City. His art is essentially decorative and he



is best known as a mural painter. Among his most important murals are the decorations of the Belasco Theatre and the Playhouse, in New York City, and of the Houses of Parliament in Ottawa, Canada, besides many private residences in the United States. His best-known recent canvases are "British Recruiting on Boston Common," in the Commons' reading room of the House of Parliament, Ottawa, and "L'En-core," Canadian National Gallery. He was elected Associate of the National Academy of Design in 1911, won the first Hallgarten prize at the National Academy in 1916, and the gold medal at the New York Architectural League in 1923.

**CROATIA**, krō-i'shī-à, See JUGOSLAVIA.

**CROCE**, krō'chā, BENEDETTO (1866- ). An Italian philosopher (see VOL. VI). Although he accomplished his mature work between his 30th and 50th years, his reputation in Anglo-Saxon countries developed largely after the World War. The publication of a biographical volume in English by Piccoli (1923) corresponded to the growing interest in a philosopher who, like Bergson, was able to combine popular appeal and intellectual insight. At the close of the War, Signor Croce took an active part in Italian politics. He attacked the politics of President Wilson, which he regarded as short-sighted and dangerous to Italian interests, and in 1920 to 1921 served as minister of education in the cabinet of Giolitti. His later works include *La Letteratura della Nuova Italia*, essays (4 vols., 1914-15); *Teoria della storiografia* (1916); *Conversazioni critiche* (1918); *Goethe* (1919); *Pagine sparse* (3 vols., 1919-20); *La Poesia di Dante* (1920); *Ariosto, Shakespeare e Corneille* (1920); *New Essays on Aesthetics* (Eng. trans., 1921); *Storia della storiografia italiana nel secolo XIX* (1921); *Poesia e non poesia* (1923); *Storia del Regno di Napoli* (1924); *Uomini e cose della vecchia Italia* (1926); *Autobiographie* (Eng. trans., 1927), and *Storia d'Italia dal 1871 al 1915* (Eng. trans., 1928). See AESTHETICS and ITALIAN LITERATURE.

**CROCKER**, BOSWORTH (MRS. LUDWIG LEWISOHN). (?- ). A playwright born in London. She was brought to the United States as a child and educated in America. She is best known for her plays, *The Dog*, produced by the Bryden Road Players (1915); *The Last Straw* (1917); *Pawns of War* (1918); *The Baby Carriage* (1919); *Humble Folk*, a collection of one-act plays with a foreword by Ludwig Lewisohn (1923); *Heritage* (1925); *Cost of a Hat* (1925); *Reprisal* (1926); *Iseult of the White Hands* (1927); *Josephine* (1927). She also wrote a novel, *Don Juan's Wife* (1924) and contributed verse and critical articles on the drama to contemporary magazines.

**CROISSET**, krwā'sā' (JOSEPH MARIE) ALFRED (1845-1923). A French philologist (see VOL. VI) who was the author of *L'Effort de la France* (1916), *Les démocraties antiques* (1916); and *History of Latin and Greek and Democracy* (1919). He also edited *Otero José Pacifico: L'Argentine devant l'histoire* (1921), translated volumes 2 and 3 of the *Œuvres Complètes* of Plato, and, with his brother, Maurice, translated the tragedies of Euripides into Spanish.

**CROISSET**, MAURICE (1846- ). A French philologist (see VOL. VI). He was the author of *La civilisation hellénique* (2 vols., 1922) and translated into Spanish *Homer: la Odisea* (1921)

and collaborated with his brother on a Spanish translation of *Euripides Tragedias* (1921). He also edited and translated Volume I of the *Œuvres Complètes* of Plato, and the *Harangues* of Demosthenes (2 vols., 1924-25).

**CROISSET**, krwā'sā', FRANCIS DE (1877- ). The pseudonym of Franz von Wiener, a French-Belgian playwright who was born in Brussels, educated at the Athénée and the university there, and then lived in Paris. His plays, a few of which were in verse, were comedies, or else more serious studies in which the dialogue was clever and witty. His works include *Chérubin* (1901); *Le Paon* (1904); *Le Bonheur, mesdames* (1905); *Paris-New York* (1907); *Le Cœur dispose* (1912); *L'Épervier* (1914); *Pour la langue française* (1924), and *La féerie cinghalaise*, travel in Ceylon (20 ed., 1926). He wrote many plays in collaboration with others, the most notable of whom was Robert de Flers, with whom he wrote *Le retour* (1921); *Les Vignes du seigneur* (1923); *Les Nouveaux messieurs* (1926); and *Les Précieuses de Genève* (1928).

**CRO'KER**, BITHIA MARY (SHEPPARD) (?-1920). An English novelist (see VOL. VI). She died in London on Oct. 21, 1920. Her works written since 1914 include: *Lismoye* (1914); *Her Own People* (1914); *Babes in the Wood* (1915); *Given in Marriage* (1916); *Johanna* (1917); *Bridget* (1918); *The Chaperon* (1920).

**CRONAU**, krō'nō, RUDOLF GEORGE (1855- ). A German journalist and author born at Solingen. He has spent a great part of his time in New York. Among his works are *Geschichte der Solinger Klöppelindustrie* (1885); *Unter dem Sternenbanner* (1887); *Das Buch der Reklame* (1889); *Im wilden Westen* (1890); *Amerika, Geschichte seiner Entdeckung* (1890); *Our Wasteful Nation* (1908); *Drei Jahrhunderte deutschen Lebens in Amerika* (1909); *The British Black Book* (1915); *Our Hyphenated Citizens* (1915); *German Achievements in America* (1916); *Woman Triumphant, the Story of Her Struggles for Freedom* (1919); *The Discovery of America and the Landfall of Columbus* (1921); *The Army of the American Revolution and its Organizer* (1923); *Die Deutschen als Gründer von New Amsterdam-New York und als Urheber der amerikanischen Freiheitsbestrebungen* (1926), a work claiming for the Germans the credit of having founded New York and originated the American movement for freedom.

**CROOKS**, kryks, WILLIAM (1852-1921). An English labor leader (see VOL. VI). In 1916 he was appointed Privy Councillor. He died soon after his retirement from Parliament in 1921.

**CROSLAND**, THOMAS W(ILLIAM) H(ODGSON) (1868-1924). A British editor and author (see VOL. VI). His later works include: *The Chant of Affection* (1915); *The Showmen* (1915); *The Soul of a Crown Prince* (1915); *The English Sonnet* (1916); *Pop Goes the Weasel* (1924), and *The Laureate's Job* (verse, 1924).

**CROSS**, (CHARLES) WHITMAN (1854- ). An American geologist (see VOL. VI). In 1918 he was president of the Geological Society of America, and a member of the National Research Council, 1918-22. He was also author of geological reports and maps published by the United States Geological Survey.

**CROSS**, WILBUR LUCIUS (1862- ). An American university dean (see VOL. VI). In

1916, he became dean of the Graduate School of Yale University, and in 1921, professor of English, resigning from a similar position in the Sheffield Scientific School. He was acting provost, 1922-23. He is the author of *A History of Henry Fielding* (1918); *An Outline of Biography* (1924); and editor of *Sterne's Political Romance* (1914); *Lounsbury's Life and Times of Tennyson* (1915); *Shakespeare's Love's Labor's Lost* (Yale Shakespeare, 1918); *Tristram Shandy* (1925); *Sentimental Journey* (1926), and *The Modern English Novel* (1928).

**CROTHERS, RACHEL** (1878- ). An American playwright born at Bloomington, Ill., who directs the production of her own plays. The quality of her work is good and her plays are exceptionally well known in the United States. They include: *The Three of Us*; *The Coming of Mrs. Patrick*; *Myself Bettina*; *A Man's World*; *Young Wisdom*; *Ourselves*; *The Heart of Paddy Whack*; *Old Lady 31*; *Once Upon a Time*; *Mother Carey's Chickens*; *A Little Journey*; *39 East*; *He and She*; *Nice People*; *Everyday*; *Expressing Willie*; *A Lady's Virtue*; *Venus*.

**CROWDER, ENOCH HERBERT** (1859- ). An American army officer. He was educated at the United States Military Academy and the University of Missouri Law School, and became major in the United States Judge Advocate's office in 1895. He was in the Philippines from 1898 to 1901, and with the Japanese Army in Manchuria in 1904-05. In 1899-1902 he was Judge Advocate General of the Army of Cuban Occupation; he drafted the legal code for the new republic and also helped to frame its constitution and to direct its financial policies and legislation. General Crowder is best known for his remarkable record as Provost Marshal General during the World War in administering the Selective Service Act which he himself had drafted. Under this law, about 24,000,000 men altogether had been registered and classified within 18 months after America had entered the War, two million of whom were in France, and almost as many more ready to go. He was awarded the D.S.M. for this service and received numerous foreign decorations. In 1919, upon invitation of the Cuban government, he initiated reforms in the Cuban electoral laws and in 1921 President Harding named him as his personal representative to the Cuban Government. In 1923 the rank of the United States' representative in Cuba was raised to that of ambassador, and General Crowder was the first to serve in that capacity. He was retired in 1927. See CUBA.

**CROWELL, BENEDICT** (1869- ). A mining engineer, born in Cleveland, Ohio, who entered war service in 1916 and was a member of the Kernan board of the War Department to report on munitions of war and arsenals. In 1917-20 he was Assistant Secretary of War and in 1918 was made director of munitions. Since 1920 he has been chairman of the board of the Crowell & Little Construction Co., Cleveland, Ohio. Among his recent books are *The Iron Ores of Lake Superior* and *How America Went to War*, in collaboration with Capt. Robert T. Wilson (1921).

**CROWTHER, SAMUEL** (1880- ). An American author, born at Philadelphia. He was educated at the University of Pennsylvania and subsequently engaged in newspaper work. He toured Europe in 1918-19 and collected his im-

pressions in several volumes. One of his most important works was *My Life and Work* (with Henry Ford, 1922), an excellent analysis of the mental processes of a large industrialist. He also wrote *The First Million the Hardest* (with A. B. Farquhar, 1922); *Life of John H. Patterson* (1923); *Today and Tomorrow* (with Henry Ford, 1926); *Men and Rubber* (with H. S. Firestone, 1926).

**CROZIER, WILLIAM** (1855- ). An American soldier (see VOL. VI). He was a major general and chief of ordnance from the beginning of the World War until December, 1917, a member of the War Council, and commander of the Northeastern Department until Dec. 31, 1918, when he was retired. For a time after his retirement, he lived in Peking. In 1928 the Polish Government conferred on him the decoration of Commander of the Order of Polonia Restituta. He wrote *Ordnance and the World War* (1920).

**CRUISER.** See VESSEL, NAVAL.

**CRUISER, ARMORED.** See VESSEL, NAVAL.

**CRUZ, OSWALDO GONSALVES** (1872-1917). A distinguished Brazilian sanitarian who studied medicine at Rio de Janeiro and Paris and bacteriology at the Pasteur Institute, Paris. Returning to Rio de Janeiro, he started an institute for bacteriology and serotherapy in 1900. He was made director of public health for the city with absolute powers to stamp out plague, yellow fever, small pox, malaria, and other pestilences. His methods embraced everything known in preventive medicine, including the condemning of much property, and within three years the city was comparatively healthy. The public reaction was so severe that at one time a revolution was threatened. Cruz by this time was practically director of public health for the whole of Brazil and as a result of his campaign his small private institute was raised to the status of a state institution, known as the Oswaldo Cruz Institute. Its annual reports illustrate its high character.

**CRYSTAL STRUCTURE.** See CHEMISTRY; PHYSICS.

**CRYSTALS.** See CHEMISTRY; PHYSICS.

**CUBA.** An island republic of the West Indies with an area of 44,164 square miles and a population according to the census of November, 1919, of 2,889,004. This was a gain of 840,024 over the last census year, 1907, or an annual average increase of 3.4 per cent. The white population increased, with a proportion to the total population in 1907 and 1919, respectively, of 69.7 and 74.3 per cent. Males continued in excess of females, the proportions for the two years were 52.5 and 53 per cent. The estimated population at the beginning of 1928 was 3,573,850. Immigration in 1911 amounted to 38,053; 1919, 80,485; 1920, 340,241; 1921-22, 128,177; 1927, 37,186. Immigration is of a transitory character, a large proportion of the immigrants returning to their native countries at the end of the sugar-crop season. Populations of the large towns in 1907 and 1927 were: Havana, the capital, 295,157 and 580,946; Cienfuegos, 30,100 and 39,020; Camaguey, 29,616 and 46,582; Santiago de Cuba, 45,470 and 63,216; Matanzas, 36,009 and 45,101. On June 30, 1927, there were 321,821 children enrolled in the 3702 elementary schools, which had 7110 teachers. There were also 467 private schools with 1545 teachers and 30,293 pupils. University in-

struction is provided by the University of Havana, which had 5473 students in 1926-27.

**Industry.** Sugar cultivation is the leading activity and the source of the country's well-being. The crop consistently increased after 1913. For that year, the crop was 2,443,986 long tons. The crop reached the very large total of 4,104,205 long tons in 1919 but dropped to 3,758,347 long tons in 1920; 1921 again showed an upward turn; 3,974,116 long tons were produced in that year. The 1922 crop reached almost 4,000,000 tons, while that of 1923, falling below previous estimates, showed a total production slightly in excess of 3,800,000 tons. In 1927 the crop was 4,508,000, while that of 1928 was limited to 4,000,000 tons. The purchase of sugar by the United States reflects the state of affairs. In 1913-14 the United States brought 4,926,606,000 pounds for \$98,894,782; in 1921, 5,180,145,000 pounds for \$194,156,615; in 1922, 9,054,289,838 pounds for \$227,257,590; in 1923, 6,852,685,625 pounds for \$331,925,712, and in 1927, 6,600,000,000 pounds for \$183,480,000. Tobacco is the crop of next greatest economic importance. In 1913 over 27,500,000 pounds (value \$16,164,795) were exported to the United States; in 1926, 24,113,000 pounds (value \$22,068,000). Other agricultural products are coffee, cacao, and tropical vegetables and fruits for the American winter markets, the economic value of these groups being slight. Cattle raising is receiving increasing attention with the result that herds increased from 2,829,553 heads in 1912 to 4,512,000 in 1925. Horses similarly increased in number. Mineral areas are considerable, but production is small. Iron, copper, chrome, manganese ores, and asphalt are regularly produced for export and there is a small output of coal and petroleum. Total exports of minerals in 1927 were valued at \$2,576,000, as compared with \$2,444,000 in 1926. Production of iron ore in 1913 was 1,608,000 metric tons; in 1926, 587,000 tons; copper in 1913, 3400 tons; in 1927, 14,096 tons.

**Commerce.** Imports in 1912 totaled \$120,229,317 and exports \$146,787,295; for 1918-19 they reached \$316,000,000 and \$477,000,000 and in 1919-20 the very high point of \$435,000,000 and \$862,000,000; for 1920-21 they dropped to \$356,435,000 and \$278,000,000 and for 1921-22 to \$180,259,000 and \$323,911,000. By 1923 imports once more ascended to \$226,118,000 for the fiscal year. In 1927 imports were valued at \$257,884,000 and exports, at \$322,705,000. The United States is the most important factor in Cuba's foreign trade, the proportions for exports and imports ranging between 70 and 80 per cent of the whole. In 1913-14 the American imports from Cuba totaled \$132,303,795; for 1920, \$721,693,880; for 1922, \$267,840,867; for 1923, \$376,442,581; and for 1927, \$245,195,052. American exports to Cuba amounted to \$68,884,428 in 1913-14; for 1920, \$515,208,731; for 1922, \$127,873,202; for 1923, \$192,437,893; and for 1927, \$159,681,523. The importance of this trade may be gauged by the fact that in 1920, American imports and exports from and to Cuba almost equaled the whole United States trade with South America. For 1922-23 the American trade with Cuba was equal to 75 per cent of the whole South American trade. Other countries participating in Cuban trade are Great Britain, Spain, and France. Imports, in the order of importance, are foodstuffs, textiles, metals and metal goods, machinery, drugs, and wood.

**Finance.** For 1912-13 estimated revenues were \$37,940,000 and expenditures, \$33,974,147; for 1922-23, \$55,638,800 and \$54,852,302; for 1928-29, \$84,400,000 and \$84,387,000. The national debt in 1911 was \$62,083,100, with the debt service, in 1911, \$2,464,585. In July, 1922, the public debt was \$91,542,400 and in February, 1928, \$93,443,500, funded and floating. By the law of November, 1914, a Cuban coinage was established, with a gold peso equal to the American dollar. American coinage remains legal tender. Cuban currency in circulation in June, 1927, was \$23,786,750 gold, \$8,413,140 silver, \$1,449,560 nickel, and \$228,572,002 in American bank notes. In an effort to hasten the stabilization of financial conditions, the United States Federal Reserve Board granted the applications of the Boston and Atlanta Federal Reserve Banks to establish agencies in Cuba in June, 1923. At the same time, as a result of the recommendations of the former governor of the Federal Reserve Board, W. P. G. Harding, who had served as financial adviser to Cuba in 1922, a Cuban national commission reported in favor of the creation of a Cuban Reserve Bank with powers to accept deposits, rediscount commercial paper, and issue paper currency.

**Communications and Shipping.** In 1928 there were 3027 miles of railway, as compared with 1949 in 1913. 7408 vessels of 24,421,972 tons net entered and 7244 vessels 23,893,754 tons net cleared the ports of the Republic.

**History.** Large sugar crops and good prices brought the country increasing prosperity. Following the closely contested election of 1916, a revolt broke out, Feb. 9, 1917, led by ex-President Gomez, but the Government, aided by the presence of American forces in the province of Oriente and by American moral support, soon had the situation in hand. In May, 1917, the Cuban Congress announced the reelection of President Menocal over his Liberal opponent, Alfredo Zayas. On April 7, 1917, both houses of Congress unanimously passed a measure declaring war on Germany. A war loan of \$13,000,000 was raised, new taxes laid, a draft act passed (1918), and the office of alien property custodian created. In 1919, as the result of the aid of General Enoch H. Crowder, U. S. A., invited by the Cuban government to advise on electoral reforms, a new electoral code was adopted designed to secure fair elections for the country in the future and providing, among other things, for obligatory voting and the public counting of ballots. In the election of 1920, political excitement ran high. Dr. Zayas, running on a Conservative-Liberal coalition ticket against General Gomez, was declared elected. The threatened crisis that followed, together with the declaration of a moratorium, led President Wilson to send General Crowder once more to Cuba. New provincial elections confirmed Zayas's victory and he was inaugurated on May 20.

In 1920-21 Cuba suffered a severe financial depression which was felt the more severely because of its contrast with the abnormal prosperity of 1919. In January, 1922, American marines were removed from the island, but General Crowder remained until October, 1922. His influence brought a number of administrative reforms, including a new civil service law, improvement of the accounts system, and means for facilitating the removal of judges. He also helped in the construction of a \$50,000,000 loan,

approved by the United States in accordance with the Platt Amendment and floated in January, 1923. With the reform measures mentioned, this loan helped to dissipate the 1920-21 depression and restore prosperity. General Crowder was named as the first American Ambassador to Cuba on Feb. 9, 1923, and on Sept. 1, 1923, Dr. Cosme de la Torriente was named Cuban Ambassador to the United States. Two days later Dr. de la Torriente was elected president of the League of Nations assembly at Geneva. In July, 1923, the feeling against continued participation of the United States in Cuban affairs found expression in a joint resolution in Congress stating that "outside interference with their civil affairs" might prejudice Cuba against the United States.

In domestic affairs, a new force emerged in August, 1923, with the formation of the Veterans' and Patriots' Association. It immediately began to conduct a campaign against public graft, the national lottery, the disabilities of women, and for the paying of soldiers' back pensions. It was so powerful that its programme was at once adopted by one of the candidates for presidential honors. In 1924 this propaganda almost succeeded in precipitating a national crisis. President Zayas moved against the Association with alacrity; its leader, General García-Vélez, was dismissed from the diplomatic service and compelled to quit the country; *El Sol*, the Association's organ, was suppressed on March 25. García-Vélez took refuge in New York and continued to direct activities, and sentiment in Cuba became feverish. An armed revolt broke out on April 29, in Central Cuba; to this the Government replied by seizing the leaders of the Veterans' and Patriots' Association. Fighting went on for two weeks, principally in the provinces of Santa Clara and Oriente, but the back of the rebellion was broken when President Zayas succeeded in inducing the United States War Department to sell the Cuban government large stores of arms and ammunition. Materials to the value of \$208,000 were purchased in this way by May 10. A general amnesty was granted May 17. Hostile elements insisted that the incident had been enormously magnified, for the most part by Zayas himself who sought to strengthen his popularity in Cuba, and that the Veterans' and Patriots' Association, instead of being discredited, remained a great force in internal affairs. Its influence, at any rate, was a large factor in eliminating President Zayas from the presidential race in 1924, from which he withdrew because of lack of popular support. He threw his strength to General Gerardo Machado, the Liberal candidate. The other candidate was General Mario Menocal, former President, who was supported by the Veterans' and Patriots' Association and other reform advocates.

In the November elections, General Machado was chosen by a large plurality. In the spring of 1925, he visited the United States. He was inaugurated on May 20, his inaugural address promising to maintain cordial relations with the United States and to promote internal improvements. In March, 1925, the United States Senate ratified a treaty with Cuba which had been before it for 20 years, by which the United States relinquished all claims to the Isle of Pines. In other respects, foreign relations, for the most part, were also satisfactory, although there was evidence of chafing among Cuban na-

tionals under the restrictions of the Platt Amendment giving the United States certain rights of supervision over Cuba's internal affairs. In November, 1926, a flurry was caused by a statement made by a Uruguayan delegate to the League of Nations to the effect that Cuban sovereignty was restricted by the terms of her relations with the United States. A rupture in diplomatic relations was averted only by an official apology by Uruguay.

In April and May, 1927, President Machado made an extended trip in the United States, in the course of which he expressed the desire for a modification of the Platt Amendment and later he advocated its complete repeal. In September, 1927, Cuba was elected to a non-permanent seat on the League of Nations Council. The outstanding international event of President Machado's first administration was the holding of the Sixth Pan-American Conference at Havana in January and February, 1928, and the attending visit of President Coolidge to the island. Cuban economics was marked by an attempt in 1927 and 1928 to keep the price of sugar stabilized by restricting the output, and in 1928 by officially regulating exports. Although the scheme was credited with having some effect on prices, the lack of a monopoly of world production by Cuba prevented it from achieving its full objective and at the close of 1928 all restriction was abolished.

Politically, the course of events under President Machado paralleled that in many other countries during this period in tending toward a centralized control which, it was charged by the opposition, approached, if it did not actually constitute, a dictatorship. Political opposition was strongly discountenanced, and on occasion sternly suppressed. On April 18, 1928, Senator Shipstead introduced into the United States Senate a resolution calling for an investigation under the Platt Amendment of charges of suppression of freedom of speech, political deportations, closing of the national university, manipulation of courts, etc. The resolution aroused a storm of protest in the Cuban press, but the Government took no official notice of it.

In June, 1927, President Machado approved a bill providing for certain constitutional amendments. In accordance with Cuban law, these amendments, after being passed by the Cuban Congress, must be passed upon by a constitutional convention elected for that purpose. The convention met the following year. As one result of its deliberations the term of the president was set at six years instead of four. He was restricted to a single term, but this limitation did not apply to President Machado. A coalition of three political parties nominated him for another term and in the elections in November he was chosen without opposition for a term ending in 1935. He was inaugurated in the new capitol at Havana.

**CUBISM.** See PAINTING.

**CULBERTSON, WILLIAM SMITH** (1884- ). An American lawyer, tariff expert, and diplomat, born at Greensburg, Pa. He graduated from the College of Emporia, Kan., in 1907, and from Yale University in 1908. After taking special courses in German universities, he became examiner of the United States Tariff Board in 1910, serving until 1912. From 1917 to 1925, he was a member of the United States Tariff Commission, serving as vice chairman after 1922. He resigned in 1925 to accept appointment

as Minister to Rumania. During the World War, he was engaged in Y. M. C. A. service in France, and in services for the Government at the Peace Conference in Paris. He is the author of *Alexander Hamilton, an Essay* (1911); *Commercial Policy in War Time and After* (1919); *Raw Materials and Foodstuffs in the Commercial Policies of Nations* (1924); *A Survey of the Economics of Diplomacy* (1925).

**CULLEN, THOMAS STEPHEN** (1868- ). An American gynecologist, born at Bridgewater, Ont. He was educated at the Toronto Collegiate Institute and the University of Toronto, became associated with the Johns Hopkins Hospital College and was made a professor of clinical gynecology at the latter and visiting gynecologist to the hospital. He has written, alone and in collaboration four important monographs: *Cancer of the Uterus* (1900); *Adenomyoma of the Uterus* (1908); *Myomata of the Uterus* (1909); *Disease of the Umbilicus* (1916); and also *Henry Mills Hurd* (1920); and *Early Medicine in Maryland* (1927).

**CULTURE. HISTORY OF.** See **ETHNOLOGY.**

**CUMBERLAND, WILLIAM WILSON** (1890- ). An American economist, born at La Verne, Calif., and educated at Occidental College, Los Angeles, and at Columbia and Princeton universities. In 1916 he became a member of the faculty of the University of Minnesota. In 1918-20 he was economic or financial expert on United States Government boards and commissions to the Paris Peace Conference, to Turkey, and Armenia and in 1921 was attached to the Department of State as expert on foreign trade. In 1921-23 he was Administrator of Customs of the Republic of Peru and governor of the Reserve Bank of Peru, 1923-24. Since 1924 he has acted as financial adviser and general receiver of the Republic of Haiti. He published *Coöperative Marketing* (1918).

**CUMBERLAND PRESBYTERIAN CHURCH.** This denomination originated in Tennessee in 1810 as an outgrowth of the revival of 1800 in Kentucky and Tennessee and in protest against some of the doctrines taught by Calvinists of that day. The membership in 1929 was 64,031, as compared with a membership of 72,052 in 1916, and the number of ministers in the latter year was 735, as compared with 728 in 1916. In 1929 there were reported 10 synods and 62 presbyteries. As a result of the merger movement of 1906, when about half the denomination joined with the Presbyterian Church in the United States of America, the Cumberland branch in 1914 was practically without property and without any educational endowment; in 1929 the church property was valued at \$3,968,868; there was an endowment of \$500,000 for education; and under the direction of the Board of Education, Bethel College and the Cumberland Presbyterian Theological Seminary, were maintained at McKenzie, Tenn. *The Cumberland Presbyterian* was published at Nashville. The 1928 National Meeting was held at Jackson, Tenn., and the 1929 meeting at Princeton, Ky.

**CUMMING, HUGH S.** (1869- ). An American Surgeon General of the Bureau of Public Health Service. He was born in Virginia and received the degree of M.D. at the University of that State (1893). Appointed an assistant surgeon in the U. S. Public Health Service in 1894, he was advanced to the rank of surgeon in 1911. During the World War he served as a Public

Health Service expert with the Navy. He became Surgeon General of the U. S. Public Service in 1920. He was president of the Allied Medical Mission to Poland and represented the United States on other international conferences. He is the author of professional papers and pamphlets.

**CUMMINS, ALBERT BAIRD** (1850-1926). An American Senator (see Vol. VI). He was re-elected United States Senator for the terms 1915-21 and 1921-27. He was joint author with Representative Esch of the act which returned the railroads to private ownership after the World War. He succeeded Calvin Coolidge as president of the Senate in August, 1923.

**CUMONT, KU'MON', FRANZ VALÉRY MARIE** (1868- ). A Belgian writer on Oriental religions (see Vol. VI), who, in 1928, added an honorary D.Litt. from Cambridge, England, to his long list of distinctions. His later works include *Comment la Belgique fut romanisée* (1914), *Études syriennes* (1916), *After-life in Roman Paganism* (1922), *Juliani imp. epistulae et fragmenta*, with Bidez (1922), and *Fouilles de Doura-Europos* (1926).

**CUNLIFFE-LISTER, KÜN-LIF-LISTER, THE RT. HON. SIR PHILIP** (1884- ). A British government official who assumed his present name in 1924. He was educated at Winchester and University College, Oxford, was called to the bar in 1908, and served in the army from 1914 to 1917, receiving the Military Cross. In the latter year, he became joint secretary of the Ministry of National Service, and in 1918 he entered Parliament as a Unionist. After serving on several committees, he was Parliamentary Secretary to the Board of Trade (1920-21), secretary to the Overseas Trade Department (1921-22), and president of the Board of Trade (1922-23, and 24- ). He was knighted in 1920 and became a privy counselor in 1922.

**CUNO, KÜ-NÖ (CARL JOSEPH) WILHELM** (1876- ). A German chancellor and director-general of the Hamburg-American Steamship Line. He was born at Suhl, Thuringia, Germany, and educated at Berlin, Heidelberg, and Breslau. He became connected with the Department of the Treasury in 1906, and in 1912 was made privy counselor. During the World War, he was director of the grain and food organization, and upon the death of Albert Ballin became the head of the Hamburg-American Steamship Line. He represented Germany at the Paris Peace Conference, and became chancellor in November, 1922. He was much criticized because of his policy of passive resistance to the French occupation of the Ruhr, and also for the fall of the mark. He resigned on Aug. 12, 1923, the immediate cause being the loss of Socialistic backing in the Reichstag.

**CUREL, KU'REL', FRANÇOIS, VICOMTE DE** (1854-1928). A French dramatist (see Vol. VI), who was elected to the French Academy in 1918. His later works were *La Danse devant le miroir* (1914); *L'Âme en Folie* (1920); *La Comédie du Génie* (1920); *L'Ivresse du Sage* (1922); *Terre inhumaine* (1922); *La Viveuse et le moribond* (1926); and *Orage mystique* (1927). Consult *Idées et portraits*; by Louis Bertrand (1927).

**CURLEY, MICHAEL JOSEPH** (1879- ). An American Roman Catholic archbishop, born at Golden Island, Athlone, Ireland, and educated in the Royal University of Ireland and at the College of the Propaganda Fide in Rome. He



was ordained to the Roman Catholic priesthood in 1904, and for the 10 ensuing years was a missionary in Florida. In 1914 he was made Bishop of Saint Augustine and in 1921 Archbishop of Baltimore to succeed Cardinal Gibbons.

**CURRAN, CHARLES COURTNEY** (1861- ). An American artist (see VOL. VI). He was awarded the first Altman Prize by the National Academy of Design in 1920.

**CURRELLEY, CHARLES TRICK** (1876- ). A Canadian clergyman, director of the Royal Ontario Museum of Archaeology (see VOL. VI). In 1919 he returned from his eight-year collecting trip to Egypt and Europe. Later, he was appointed professor of the history of industrial art in the University of Toronto.

**CURRICULUM REVISION.** See EDUCATION IN THE UNITED STATES.

**CURTIS, CHARLES** (1860- ). An American Senator and Vice President (see VOL. VI). He was reelected to the United States Senate for the terms 1915-21, 1921-27, and 1927-33. In June, 1928, he was nominated for vice president by the National Republican Convention at Kansas City and elected on Nov. 6 for the term beginning on Mar. 4, 1929.

**CURTIS, CYRUS HERMANN KOTZSCHMAR** (1850- ). An American publisher (see VOL. VI). He purchased the New York *Evening Post* in 1923, retaining his ownership of the Philadelphia *Public Ledger*, the *Saturday Evening Post* (Philadelphia), the *Ladies' Home Journal*, and the *Country Gentleman*, and expanding the circulation and influence of all these publications. In 1924 he founded the Curtis Institute of Music, Philadelphia, of which Josef Hofmann became director in 1927.

**CURTISS, GLENN HAMMOND** (1878- ). An American aviator (see VOL. VI). In 1914, he designed and constructed for Rodman Wanamaker the *America*, which was the first heavier-than-air flying boat made for transatlantic passage. In 1917, in conjunction with J. N. Willys, he increased the output of his factories to meet the war demands of England, Russia, and the United States. He developed various types of aircraft, especially the *Wasp*, the holder of world records for speed and altitude, and, with the United States Navy, the Navy-Curtiss flying boats 1, 2, 3, and 4. He also built several types of aeronautical motors and designed and made machines of distinctive plan.

**CURTISS, RALPH HAMILTON** (1880- ). An American astronomer, born at Derby, Conn. He was graduated in 1901 at the University of California, where in 1904 he received his Ph.D. After serving as an assistant in astronomy at California during 1900-01, he was a fellow during 1901-05 at the Lick Observatory, and was a member of the Lick Eclipse Expedition (1901) to Sumatra. In 1905 he became assistant astronomer at Allegheny Observatory and two years later, assistant professor of astrophysics at Michigan, where in 1918 he became full professor, also serving as assistant director and after 1927, director, of the Detroit Observatory. His researches have had to do chiefly with the spectroscopy of the heavenly bodies, photography of comet forms, spectrography of variable stars, and of stars with peculiar spectra in Class B, on all of which he has published papers.

**CURWOOD, JAMES OLIVER** (1878-1927). An American author; born at Owosso, Mich. From 1900 to 1907, he was engaged in newspaper

work, but in the latter year resigned from these activities to devote himself exclusively to novel-writing. His romances enjoyed a wide popularity and sold by the hundreds of thousands annually. They were usually vivid tales of the Canadian Northlands, depicting conventional emotions and conflicts, but written with an earnestness that often gave them the aspect of reality. The better known included: *Flower of the North* (1912); *God's Country and the Woman* (1915); *Nomads of the North* (1919); *The Valley of Silent Men* (1920); *The Country Beyond* (1922); *The Alaskan* (1923); *A Gentleman of Courage* (1924); *The Ancient Highway* (1925); *The Black Hunter* (1926).

**CURZON LINE.** See VILNA DISTRICT.

**CURZON OF KEDLESTON, GEORGE NATHANIEL CURZON, FIRST MARQUIS OF** (1859-1925). An English statesman (see VOL. VI). In the Asquith coalition cabinet, he was Lord Privy Seal (1915-16) and President of the Air Board (1916). In December, 1916, in Lloyd George's government, he was one of the four members of the War Cabinet in whose charge rested the details of all military and civilian operations, leader of the House of Lords, and lord president of the Council. In 1919 he resigned the latter office and became Secretary of State for Foreign Affairs, a portfolio he held until his retirement on the resignation of the first Baldwin government in 1924. While Lloyd George was Prime Minister, Curzon was not the chief in his own department, but when Bonar Law became Premier, he was given a free hand. In the West, he had continual differences with France, first over the reparations question, and then in actively opposing the French occupation of the Ruhr. But in the East, his leadership had its real successes. In April, 1923, he presided over the Lausanne Conference to conclude a peace with Turkey. The task was a difficult and complicated one and the terms that Curzon got were considered the best obtainable.

He was an expert analyst of a situation, but was not regarded as an equally able executive. He was apt to push a plan and then retreat from it. Although considering the bill for the enfranchisement of women very undesirable, he did not vote against it. He attained all the grades of the peerage except that of Duke. In 1916 he received the Garter. He wrote *Modern Parliamentary Eloquence* (1913); *War Poems and Other Translations* (1915); *Subjects of the Day* (1915); *Tales of Travel* (1923); *British Government in India* (1925); and *Leaves from a Viceroy's Note-Book and Other Papers* (edited by F. W. Pember and I. Malcolm, 1926). The Earl of Ronaldshay wrote *The Life of Lord Curzon* (3 vols, 1927-28).

**CUSHENDUN, KÓOSH'ĒN-DĪN, THE RT. HON. RONALD JOHN MCNEILL, FIRST BARON** (1861- ). A British public official who was born in Ireland and educated at Harrow and Christ Church, Oxford. In 1887 he was admitted to the bar. Twelve years later he became assistant editor of *St. James's Gazette*, of which he was editor from 1900 to 1904. A Unionist in politics, he stood four times for Parliament from 1906 to 1910 and in 1911 was elected, retaining his seat until he was raised to the peerage in 1927. He was parliamentary Under-Secretary of State for Foreign Affairs from 1922 to 1925, with the exception of the period in 1924 when Labor was in control of the Government. Financial Secretary of the Treasury (1925-27), and, after the resig-

nation of Lord Robert Cecil in August, 1927, took his place in the cabinet as Chancellor of the Duchy of Lancaster and British representative at the League of Nations. At the same time, he became a peer as Lord Cushendun. He had been made member of the Privy Council in 1924. In August, 1928, the poor health of Sir Austin Chamberlain forced him to take a long vacation, and Lord Cushendun was appointed acting Foreign Secretary in his absence. In this capacity, he signed the Paris Peace Pact, and had the difficult task of allaying the suspicions of the other nations on their discovery of the Anglo-French naval accord. He wrote *Home Rule: Its History and Danger* (1907); *Socialism* (1908); "History of Australia and New Zealand" in *Historian's History of the World* (1908), and *Ulster's Stand for Union* (1925).

**CUSHING, HARVEY (WILLIAMS)** (1869- ). An American surgeon (see Vol. VI). During the World War, Dr. Cushing was director of United States Base Hospital No. 5. His monograph, *Tumors of the Nervus Acusticus*, was published in 1917. Recently, Dr. Cushing has lectured in Great Britain on his special subject of tumors of the brain and the number of patients whom he has operated on for this condition is now reckoned in the thousands. In the field of literature, Dr. Cushing produced a biography of Sir William Osler in two volumes (1924) which won the Pulitzer award of \$1000 for the year's best biographical work. Later works are *Studies in Intracranial Physiology and Surgery* (1926) and *Consecration Medici and Other Papers* (1929).

**CUSHNY, ARTHUR ROBERTSON** (1866-1926). A British pharmacologist, who was born in Speymouth, Morayshire, Scotland. He was graduated in arts and medicine from the University of Aberdeen in 1889, took post-graduate courses on the Continent, and during 1892-93 was assistant to the professor of pharmacy at the University of Strassburg. In 1893 he came to the United States as professor of pharmacology at the University of Michigan, remaining until 1905, when he was called to the chair of pharmacology and materia medica at the University of London. In 1918 he was called to the same department of the University of Edinburgh. His chief writings are his *Textbook of Pharmacology and Therapeutics*, (1916, 8th ed., 1924) and monographs, *Secretion of Urine* (1917) and *Use in Medicine of Digitalis and its Allies* (1924).

**CUTHELL, CHESTER WEDE** (1884- ). An American lawyer, born in New York City. After graduating from Columbia University Law School, he began the practice of law in New York City, and also in Washington. In 1918-19 he acted as general counsel of the United States Shipping Board Emergency Fleet Corporation, and effected collections of claims of the War Department against England, France, and Italy. He was awarded the Distinguished Service Medal of the United States and decorations by the governments of France and Italy.

**CYCLING.** Professional cycling now ranks as one of the most profitable sports in the United States, where large velodromes have been constructed to accommodate the large crowds attracted by the professional racing events. Cycling as a recreation also has its devotees, particularly among the children.

**CYCLONES.** See METEOROLOGY.

**CYPRUS.** An island of the Mediterranean and a British Crown colony; area, 3584 square

miles; population in 1911, 274,108; in 1926, 310,709. The population was 80 per cent Greek and almost 20 per cent Turkish. The leading activity is agriculture. Chief exports in 1926 (1911 figure in parentheses) were animals, £71,166 (£94,932); carobs, £153,905 (£182,883); wine, £39,178 (£53,685); raisins, £58,198 (£29,636); fruits, £40,905 (£21,585); silk cocoons, £6204 (£27,587). Imports are foodstuffs, coal, petroleum, cotton piece goods, manufactured articles, and machinery. The trade record shows that the imports for 1913, 1920, and 1927, exclusive of bullion, were £619,337, £2,068,759, and £1,585,639; exports for the same years, £620,591, £1,200,449, and £1,542,870. Revenues for 1913-14 were £341,816; for 1926, £629,266. Expenditures for 1913-14 were £296,165; for 1926, £655,227. The imperial annual grant is £50,000; the public debt, 1926, £186,732. British occupation of Cyprus, since 1878, became outright possession when the British Government declared the island formally annexed on Nov. 5, 1914. The Treaty of Lausanne in 1923 recognized Great Britain's right in Cyprus.

**CYRENAICA.** See LIBYA.

**CYTOLOGY.** See ZOÖLOGY.

**CZECHOSLOVAKIA,** *chěko-slovā'kia*. One of the newly created states of Europe, formed out of all or parts of the old Austro-Hungarian government of Bohemia, Moravia, Silesia, Slovakia, and Ruthenia, on Oct. 28, 1918. The frontiers, delimited by the Treaties of Versailles, St. Germain, and the Trianon, and the Ambassadors' Conference of July 28, 1920, affecting the Teschen district, had an area of 54,207 square miles and a population, by the census of Feb. 15, 1921, of 13,613,172. The provinces, with their areas and populations, are Bohemia, 20,102 square miles, population, 6,670,582; Moravia, 8616 square miles, population, 2,662,884; Silesia, 1708 square miles, population, 672,268; Slovakia, 18,895 square miles, population, 3,000,870; Ruthenia, 4886 square miles, population, 606,568. The principal towns, with their populations in 1921, are Prague, 676,657; Brunn, 221,758; Pilsen, 88,416; Pressburg, 93,189; Kosice, 52,898. Ethnologically, the great majority of the people are Czechoslovaks (8,760,937); the ratio between Czechs and Slovaks is about three to one. Of the other races, the Germans include 3,123,568, the Magyars, 745,431; the Ruthenians, 461,849; the Jews 180,855; the Poles, 75,853. From 1910 to 1921, the Czechoslovaks increased 9 per cent and the Ruthenians 6, while the Germans declined 17 per cent and the Magyars 30. By religions, the population was divided into Roman Catholics, 10,384,833; Protestants, 990,319; Greek Catholics, 535,543, and Jews, 354,342. Compulsory education is provided for with particular care in Slovakia and Ruthenia, where the stern policy of Magyarization systematically carried out by the Hungarian government had kept the mass of the population ignorant of their native tongue. In 1926 there were 14,158 public and private elementary schools, with 694,282 boys and 709,541 girls; and 1736 public and private higher grade schools with 165,601 boys and 144,409 girls. There were also 354 secondary Latin and technical schools with 108,760 pupils. There are four universities as follows: Prague (Czech) with 8176 students; Prague (German), 3447; Brunn (Czech), 1878; and Bratislava (Slovak), 1809. By the treaties, racial minorities are guaranteed protection in

their racial and religious rights. In districts where a minority constituted 20 per cent of the population, full rights were accorded for the use of the native tongue in schools and before judicial and administrative bodies. See SLAVONIC LITERATURE.

**Agriculture.** Because industry in the East was primarily agricultural, the largest single group of workers is busied on the land; this is about 40 per cent of the total population. Methods of production are intensive; aided by a strong government interest, they yield good profit. In 1926 there were 14,609 acres of arable land, or about 42 per cent of the total area; 6,374,000 acres of permanent meadow and pasture; 406,000 acres of trees, shrubs, and bushes and 11,495,000 acres of woods and forests. The following table compares acreage and production in 1919 and 1927:

Crop	Area (thousands of acres)		Production (thousands of units—bushels, except as indicated)	
	1919	1927	1919	1927
Wheat	833	1,579	15,869	40,384
Rye	1,811	2,012	82,734	49,297
Barley	891	1,755	22,569	59,014
Oats	1,368	2,108	46,099	100,423
Corn	82	391	443	11,755
Potatoes	885	1,607	84,091	354,703
Sugar beets	433	727	3,636*	8,124*
Hops	21	31	9,594*	21,609*
Grapesvines	46*	42	8,807*	.....
Hemp	1	28	720	16,715*
Flax	85	54	16,881*	25,386*
Tobacco	3*	13	3,893*	15,653*

\* unit, metric ton    † unit, pound    • 1920

\* unit, gallon of wine

Live stock (1927) included cattle, 4,691,320; horses, 740,202; pigs, 2,539,201; sheep, 861,128; goats, 1,241,701. These numbers were considerably less than those antedating the World War. The sugar-beet industry, which ranked second in the world, engaged 166 factories and refineries in 1926, and these produced 722,955 metric tons of sugar; production in 1927–28 was 1,241,000 tons. Similarly, the hop industry supported 525 breweries which produced 264,749,000 gallons of beer in 1927. The centre of hop culture is in the Saaz, the breweries in Pilsen. Land reform, always a crying need in the provinces, because of the preponderance of great entailed estates usually owned by foreign families or by German or Magyar overlords, became at once the concern of the new Government. By an act of 1919, the National Assembly ordered the expropriation of all estates of more than 475 acres if cultivated and of 350 acres if uncultivated. By January, 1922, 9,746,076 acres had been seized. In Bohemia, farms of  $7\frac{1}{2}$  acres or less totaled only 23.5 per cent of the whole area; all the rest consisted of large estates. In Moravia, small farms had totaled 29.6 per cent, and in Silesia, 25.2 per cent. The progressive character of the agricultural class was indicated by the presence of some 10,000 agricultural coöperatives with a membership of 1,000,000.

**Minerals and Industries.** Coal and iron are the principal minerals. Coal production, including lignite, in 1921 totaled 32,699,112 metric tons; in 1928, 35,880,861 tons. While coal does not suffice for native wants, the yield of lignite is more than sufficient. In the Ostrava-Karvin Basin, 70 per cent of the total coal production was mined; in the Most-Teplice Basin, 77 per cent of the total lignite was extracted. Other mines yield gold, lead, copper, rock-salt, and graphite. The total number of

workers in coal mining in 1928 reached 94,420. The petroleum region, extending along the Carpathians and marking the continuation of the Galician fields, produces about 7000 tons annually. With these resources, the metallurgical industry is able to support 27 furnaces, 10 of them in Bohemia, the most important at Witkowitz and Kladno, with an annual capacity of 1,500,000 tons. In 1927, 1,300,000 tons of pig iron were turned out; in 1921, 543,100 tons. Steel production reached 1,700,000 tons in 1927. There are well-known mineral springs at Karlsbad, Marienbad, Franzensbad, Teplitz, and the chalybeate springs of Giesshübel and Bilin. Other plants, numbering some 11,619 in 1925 concern themselves with the manufacture of textiles, glass and precious stones, food articles, furniture, machines, metals, paper, and chemicals. The important centres for textiles are Reichenberg, Trautenau, and Brünn; for china, Karlsbad; for glass, Gablonz and Haida; for chemicals, Aussig.

**Commerce.** Imports in 1921 reached a value of 22,435,000,000 crowns; in 1922, 12,695,000,000 crowns; and in 1927 they were 17,937,095,000 crowns. Exports for 1921 and 1922 were 27,312,000,000 and 18,086,000,000 crowns, and 20,126,773,000 crowns in 1927. The principal exports are glass, finished textiles, fuel, and sugar; the imports are raw textiles, foodstuffs, and iron. The greatest volume of imports come from Germany, which, in 1927, sent 35.2 per cent of the total. Others participating were the United States, 5.6 per cent; and Austria, 7.8 per cent. Proportions of exports, by value, in 1927 were: Germany, 24.1 per cent; Austria, 15.2 per cent; United Kingdom, 7.6 per cent. Imports from the United States for 1927 were valued at \$36,343,000, and exports at \$29,958,000.

**Communications.** On Jan. 1, 1928, there were 8522 miles of railway in the state, of which 6849 miles were government owned. In July, 1923, the Government acquired the Bustchrad Railway, the last privately owned line of importance. From 1920 on, the Government applied itself to the projection of a system of lines connecting east and west. The programme called for the construction of 15 new lines, 558 kilometers in length, of which 389 kilometers were to be in Slovakia, and the rest, of lines connecting Slovakia with the West. The plan included the building of a railway through the centre of Slovakia, leading from Veseli on the Moravia River to Marmaroska Sihot. There are 265 miles of navigable waterways on the Elbe and Danube rivers. The former connects the country with Hamburg and the North Sea and the latter with the Balkans. Pressburg is the chief port on the Danube and its terminal developments are being rapidly pushed. By the Treaties, Czechoslovakia was given the right to use certain wharfs in the ports of Hamburg and Stettin. The country had 44,231 miles of telegraph line and 249,194 of telephone line in 1926.

**Finance.** In 1927 the total debt amounted to 34,385,000,000 crowns, of which 23,592,000,000 were internal debt; 6,393,000,000; external debt; and 4,400,000,000, debt imposed under the terms of the peace treaty. In the budget for 1928, receipts were estimated at 9,562,270,000 crowns (\$283,043,000, at \$.0296) and expenditures, at 9,536,074,000 crowns (\$282,268,000). Revenues came from direct taxation, indirect taxation, government monopolies, and state enterprises.

On the service of the debt, the 1928 budget carried 2,774,389,000 crowns. In December, 1927, 8,417,000,000 crowns were in circulation, against a metallic reserve of 1,007,000,000 crowns.

**History.** That Czechs, whose dreams of national independence had been kept alive since their defeat at the Battle of the White Mountain in 1620, should look on the outbreak of the War with misgivings and should render its prosecution only a lukewarm support was to be expected. Their leaders had openly identified themselves with Pan-Slavism; victory for the Central Powers would mean submergence of their racial aspirations. But that resentment should be so violent as to take the form of wholesale desertions had presumably never occurred to the Austrian bureaucracy. It is estimated that voluntary surrenders of Czechs to Serbs numbered 35,000 in 1914 alone; 300,000 surrendered to Russians and 30,000 to Italians during the war period. Retaliatory measures were therefore extreme. Czech civilians interned numbered 25,000; 5000 were sentenced to death by courts martial; attempts were made to force submission by the imprisonment of the womenfolk of absent Czech patriots; papers were suppressed, the Slav societies dissolved, and German installed as the official language in Bohemia. Magyar activities in Slovakia were even harsher. Driven underground, Slovak resistance took the form of a secret society, a sort of Mafia, which kept up a steady stream of communications with leaders abroad, maintained a secret intelligence, and practiced successfully an economic and military sabotage.

The outside world was apprised of the struggles of the people for independence by the Czechoslovak National Committee at Paris, and the work of the outstanding national leaders, the Czechs Masaryk and Beneš, and the Slovak Stefanik. First fruits of their labors appeared when the liberation of the Czechoslovaks was included in the statement of the Allies' war-aims on Jan. 10, 1917; the next development was Czech spokesmen's audacious championing of their causes of historic rights and national self-determination in the first Austrian Parliament called since 1914, on May 30, 1917. On Jan. 6, 1918, at Prague, a convention of all the leaders of the Czechoslovak world met and openly made demands for a sovereign state and the liberation of Slovaks from Magyar exploitation. Other such congresses, at Prague, April 13; at Rome, April 8-10, and again at Prague, May 16, made it plain to the Allies that the subject races of the Dual Monarchy were one in demanding liberation. Other evidence of the wholeheartedness with which Czechoslovaks were ready to give proof of their support of the Allies' purposes was furnished by their equipping troops for the Allies' armies. The most important Czech unit was the corps formed of Czech prisoners in Russia after the revolution. This took part in the fighting on the eastern front in July, 1917, and then, after the collapse of the Russian Army, undertook an astounding and almost mythical journey through the heart of Siberia in 1918 to join the troops on the western front. In the West, in December, 1917, a Czechoslovak unit was recognized; on the Italian front, the same steps were taken. Beginning with the summer of 1918, one after another of the Allies recognized Czechoslovakia as of their number and the National Committee as its *de facto* government; the United

States did so on Sept. 3, 1918. On October 7, the Dual Monarchy formally accepted President Wilson's statements as a basis for negotiation; on October 14, Beneš announced the establishment of a Czechoslovak government, and its principles were promulgated on October 18; on the same day, President Wilson declared to Austria-Hungary that no negotiations could be undertaken without the recognition of Czechoslovakia's and Jugo-Slavia's independence; on October 17, Andrássy accepted for the Dual Monarchy and in so doing dealt Austria-Hungary its deathblow.

Czechoslovakia was now a European state. Its first national assembly met at Prague, Nov. 14, 1918, welcomed the Slovak delegates, elected Masaryk first president by acclamation, and set up a cabinet with Dr. Kramář as Premier and Dr. Beneš as Foreign Minister. Dr. Kramář and Dr. Beneš were delegated to represent the country at the Peace Conference. The conflicting claims of self determination and historic rights have already been alluded to: in these centred the leading difficulty before the Peace Commissioners with respect to Czechoslovakia. The old Czech kingdom had included the whole of the provinces of Bohemia, Moravia, and Austrian Silesia; within these there were now 3,500,000 Germans, constituting 37 per cent of Bohemia's population, 28 per cent of Moravia's, and 44 per cent of Silesia's. It was therefore with some hesitation that the Supreme Council decided to yield to the demand for historic justice, instead of racial, and created a state embracing so great a number of a minority and antagonistic people. Ample grounds were to be found for the decision; the Czechs had after all come to the country first, while the Germans had been colonized there; the boundaries had to be kept intact for strategic reasons; economic considerations, such as the convergence of the rivers toward the centre of the country, and German Bohemia's being an industrial centre and thus serving to complement the agricultural districts of the rest of the country, favored the move. In the case of Slovakia, historic rights were ignored in favor of Czechoslovak claims, and the Danube was accepted as the southern frontier in spite of large Magyar minorities on the left bank. In Ruthenia, in 572,028 inhabitants, there were 319,361 Ruthenes, 169,434 Magyars, 62,187 Germans, and only 4057 Slovaks, and the request of certain delegates of Ruthenians resident in the United States for union with Czechoslovakia was far from convincing; but as the Allies wished to establish direct territorial contact between Czechoslovakia and Rumania, and above all to prevent the future union of so strategically important a region as Carpathian Ruthenia with Russia or Ukraina, ethnic ties were ignored, and the area was assigned to Czechoslovakia, with treaty stipulation for autonomy, a separate diet, and the retention of the Ruthene language. Only in the Teschen, Zips, and the Orava areas in the north was the boundary left undetermined; the Treaty provided for plebiscites there. The Czechoslovak commissioners also effected the internationalization of the Elbe, the use of free zones in the ports of Hamburg and Stettin, and the reconstitution of the European Commission of the Danube.

The National Assembly continued to sit until the framing and adoption of the new constitution, Feb. 29, 1920. This document, which

showed largely the American and French influence, provided for a president, a parliament of two houses, and a judiciary somewhat on the American plan. The President was to be elected for seven years by both Houses in joint session, was to represent the Republic in its international relations, to head the army, and to have the power to summon, prorogue, and dissolve Parliament. He did not have the right of veto. Both Chambers were to be elected by universal manhood and womanhood suffrage, on the basis of proportional representation. The Chamber of Deputies was to have 300 members; the Senate, 150. Declarations of war and amendments to the constitution might be passed only by a three-fifths vote of all the members of both Houses. Finance and army bills were to originate in the Lower House. Cabinet ministers, 15 in number, were to be appointed by the president and to be responsible to the Parliament. During the intervals between sessions, a permanent parliamentary commission was to exercise the legislative power. A constitutional tribunal was to pass on the constitutionality of laws; there were to be special benches in the case of litigation in mining matters; and industrial courts were provided for labor disputes.

In the elections of April, 1920, no less than eleven parties returned representatives to the Chamber or the Senate, or both, the vote by nationalities being: Czechoslovaks, 4,203,480; Germans, 1,576,692; and Magyars, 274,630. The Social Democrats had by far the largest deputation, 74 deputies and 41 senators, although 22 deputies and 5 senators broke away to form a Communist wing. A Social Democrat, V. Tussar, accordingly formed a ministry, on July 8, 1919, succeeding Kramář. On Sept. 15, 1920, Tussar was succeeded by Jan Černý (National Democrat), as a result of a split in the Socialist Party. Černý in turn gave way to Beneš (Independent) on Sept. 26, 1921, and Beneš to the Agrarian A. Švehla on Oct. 8, 1922. In all these cabinets, the portfolio of foreign affairs was held by Dr. Beneš. The cabinets included representatives of all Czechoslovak parties except the extreme left.

The Švehla cabinet, which remained in power some years, rested on a coalition of five parties, the Agrarians, Social Democrats, Czechoslovak Socialists, National Democrats, and People's Party (Clericals). The problems confronting the leaders of the young state were indeed grave. Food and clothing were scarce, the cost of living high, the coal shortage serious, the rate of exchange unfavorable, and the transportation system, because of the studied plan of Austria-Hungary, hopelessly inadequate. But the economic snarl slowly disentangled itself so that from 1922 on Czechoslovakia presented the pleasant spectacle of a country at work, with high wages, and an appreciating currency. The well-being of the workers and rural laborers was zealously provided for in elaborate codes of social legislation. Cultural problems were less easy of solution. The problem of racial minorities cut deeply. The superior attitude of the Czechs toward the Slovaks brought increasing dissatisfaction until it reached the point where an autonomous movement made much headway. The Germans, the most cultivated and industrialized of the races of the country, were treated harshly, and they and the Magyars were hard hit also by the expropriation of the land in favor of the

small farmer. As for Ruthenia, it was not until March, 1924, that elections were held in the provinces for representatives to the National Assembly.

Educational and religious differences contributed to domestic friction. The relentless Magyarization in Slovakia and Ruthenia had left the larger part of the population illiterate, whereas in Bohemia and Moravia educational standards were high. In 1920 as a result of the "Away from Rome" movement, which contended for such changes in Roman Catholic practice as abolition of celibacy, the use of the vernacular in church services, and a more democratic church administration, all of which the Pope naturally refused to countenance, dissatisfied bodies founded the Czechoslovak National Church. By the 1921 census, 120 churches and 525,313 communicants were recorded. The political significance of the act lay in the fact that the Church was being supported by the Czechs, while the Slovaks, who were the most pious Catholic peasantry of Europe, regarded it with hostility.

In the national Parliament, these differences combined with other divergencies in political belief to produce such strains in the coalition government as to make it difficult for the cabinet to hold together. Toward the close of 1924, the Slovak, German, Hungarian, and Ruthenian delegates, representing the racial minorities, walked out of Parliament. In spite of its lack of unity, however, the Government retained sufficient strength to initiate and carry forward a comprehensive financial reorganization, under which expenditures were presently cut down and the yearly budgets began to show continual small surpluses. As one of the new features, a national bank authorized to issue currency on a gold-redemption basis was established. The Government was able also to put through a number of measures for the better protection of the working classes. In the session ending in June, 1924, Parliament passed laws to guard tenants against excessive charges by landlords and to widen the scope of unemployment insurance. In October, 1924, it passed a noteworthy act providing for sickness, disability, and old-age benefits for workers, the cost to be met by equal premiums from employer and employee, and by government subsidy. In May, 1925, a complementary law was passed which applied these benefits to independent, non-salaried workers. Taken together, these various acts constitute one of the most comprehensive sets of social-insurance safeguards to be found anywhere in the world. While Socialist influence was pressing this legislation, the Agrarians were demanding a protective tariff on agricultural products. Opposition by the Social Democrats, one of the coalition parties, prevented passage of the measure in 1924, but in 1925 they agreed to the imposition of duties when prices went below the cost of production. The issue was not settled, however, and it continued to be a disintegrating force within the coalition. The Government was still further weakened by a revival of the religious controversy. Among the reforms which the coalition Government was anxious to push was the further separation of church and state. With its precarious support, it could do no more than pass an act providing for certain national holidays in place of a number of church holidays. When the Government officially participated in the celebration of the John Huss anniversary on July 6, the Vatican promptly protested and withdrew the papal nuncio from



Prague. Shortly thereafter, the Government's representative to the Vatican also was recalled. The clash was echoed in the cabinet, from which a Socialist minister resigned.

The elections toward which events had long been tending soon became inevitable. They were held in November and resulted in a small reduction in the number of seats held by the coalition parties, bringing their combined vote in the Lower House down to 146, or less than a majority of the 300 members of that body. The Czech Agrarians still led all other parties with 45 seats. The Clericals held 31 seats, the Social Democrats 29, the Czechoslovak Socialists 28, and the National Democrats 13. In order that a government might be formed, these five parties were joined by a sixth, the Middle Class or Traders' Party, with 13 seats. The Communists with 41 seats were numerically the strongest of the several opposition parties. In December, M. Svehla succeeded in forming a new coalition government, but it was felt to be only a temporary arrangement. A new alignment of political forces was in fact in process, marked among other features by the tendency of the Germans and other racial minorities to draw closer to the national Government, whose authority was thus more consolidated than at any time since the establishment of the Republic.

On Mar. 17, 1926, M. Svehla resigned, partly because of illness and partly because of a failure to solve questions of pay for state employees and an additional tax on grain, and the Socialists, alienated by a revival of the proposed measure for flat agricultural tariffs, left the coalition. A new cabinet, made up of officials, was formed by former Premier Cerny, but it was admittedly a provisional and stop-gap government.

The anomalous political situation furnished just the right soil for the germination of the seeds of Fascism which were abroad in the land. In May, a demonstration was held in Slovakia, where the Fascists championed the Slovak demands for autonomy. The disaffected elements there and elsewhere, however, failed to rally to the Fascist cause and the movement presently subsided as an imminent threat. The political ferment of the times was reflected in an exceedingly stormy session of Parliament, which adjourned in June after passing the agricultural tariff measure and others of some importance. In October, the changes which had been proceeding in political sentiment received formal recognition when M. Svehla, partially restored to health, again took the helm with a cabinet which included, notably, representatives of the German Agrarians and the Christian Socialists. The temper of the new Government was markedly bourgeois-conservative and the Socialists were largely carried into the opposition. Among the noteworthy reforms effected by the new Government was the establishment of a system of local administration in the provinces, which to a great extent quieted the demands of the Slovaks for autonomy.

In 1927 the first seven-year term of Dr. Masaryk as President expired. In spite of his immense popularity throughout the country, his reelection for a second term was strongly opposed by conservative elements as well as by the Communists. However, on May 27, he was reelected by the two Houses of Parliament, receiving 274 out of a possible 432 votes, or 16 more than the required three-fifths. For the Communist candidate, 54 ballots were cast, and 104 ballots were blank. In a speech delivered in October, Presi-

dent Masaryk declared that, aside from the revolution itself, land reform was the outstanding achievement of the Government. That the position of the cabinet was more conservative than the general sentiment of the country was indicated when it was forced to modify materially a bill to amend the workmen's insurance act before the bill could be passed, and also when the elections to the legislatures of the provinces showed marked Socialist gains. The result was attributed in part to a reaction against governmental repression of Socialist activities.

Slovak indignation rose high in December, 1928, when Professor Tuka, a Slovak member of the Lower House, was arrested on charges of espionage and high treason. On Mar. 2, 1929, Alexander Mach, secretary of a Slovak national organization, also was arrested. Because of long-continued ill-health, Premier Svehla was forced to resign, Feb. 1, 1929, and was succeeded, without a cabinet reorganization, by M. Franz Udrzal, Minister of War.

The foreign policy of Czechoslovakia was perforce bold, in view of the new nation's situation as a landlocked state almost surrounded by a cordon of hostile neighbors. In its international relations, it was guided by two principles, the maintenance of friendly relations with the Entente and with France first and then with Italy, and the creation of a group of conventions with the succession states of Austria-Hungary for the preservation of the *status quo*. With the aid of France, the military establishment was perfected; in 1921 a military accord between the two powers was formed; on Jan. 25, 1924, after lengthy pourparlers between Poincaré and Masaryk, and Beneš, a political alliance with important implications was signed. This included a pledge on the part of both nations to maintain the peace treaties and to prevent a Hapsburg restoration; promises of mutual support, but without definite military commitments; the upholding of the League of Nations; arbitration in the case of disputes, and a new commercial convention. Though Beneš succeeded in convincing Great Britain that the intent of the treaty was pacific, by Germany and Italy the whole was regarded with suspicion, while Austrian and Hungarian comments were plainly querulous. In order to offset this increase of French influence, Italy, on May 28, concluded a treaty with Czechoslovakia providing for cordial relations between the two countries, close adherence to the Peace Treaties, arrangements for possible concerted action in case of war between either country and a third power, and defense of mutual interests.

The creation of the Little Entente in Central Europe was largely the work of Beneš. By a series of bilateral conventions formed in 1920 and 1921, Czechoslovakia, Yugoslavia, and Rumania united to preserve the peace in central Europe, to further the maintenance of normal economic relations, and to block consistently all attempts at reaction, in Hungary and Austria particularly. (For the character of the alliance and its achievements, see *LITTLE ENTENTE*.) A political convention of a similar nature was signed with Poland in 1921. Relations with Poland, however, continued strained because of frontier disputes. But, in 1923, the chief point of controversy, involving the village of Tavorina, was referred to the League of Nations which decided in favor of Czechoslovakia. Friendly feelings between the two countries were completely

destroyed by a series of treaties signed in 1924 and 1925. Czechoslovakia regarded with suspicion all attempts at a Hapsburg restoration in Hungary; it objected, too, to the proposed union of Austria and Germany, or a Danubian confederation. In the field of commercial relations, treaties and trade agreements were concluded with almost all the country's European neighbors and with the United States on the basis of the most-favored-nation clause. In Russian political affairs, Beneš steadfastly refused to intervene, but in 1921 unofficial missions were exchanged between Russia and Czechoslovakia, and on June 5, 1922, a commercial agreement similar to the Anglo-Russian arrangement was concluded, opening the vast but disorganized Russian market to Czech enterprise. In September, 1923, Czechoslovakia was elected as one of the smaller nations to be represented in the League of Nations Council. This was in line with the understanding insisted upon by the Little Entente and agreed to by the League, that at least one member of the Entente should at all times have a seat in the Council.

Czechoslovakia continued to make support of the Little Entente the central feature of her foreign policy, and worked to strengthen the alliance and broaden its scope. In 1925 the country participated in the Locarno Conference, the result of which was to render more secure Czechoslovakia's position in the midst of the jealousies and rivalries of Central Europe. As a specific outcome of the Conference, Czechoslovakia signed a general arbitration treaty with Germany. This was followed, in 1926, by a comprehensive arbitration treaty with Austria which made arbitration practically obligatory in all disputes which could not be settled through the usual diplomatic channels, and created a permanent arbitration board from which appeals could be taken to the Hague court. Arbitration treaties with other countries also were negotiated, including Denmark, Sweden, Spain, and the United States, and Czechoslovak relations generally were placed on a friendly basis with all countries except Hungary. Advances made by Dr. Beneš toward Hungary met with little or no encouragement although they indicated a willingness to make territorial readjustments in favor of Hungary and to accept a settlement of the monarchical question which did not bring back the direct Hapsburg succession to the throne. The opposition of the Little Entente, led by Czechoslovakia, to revision of the Peace Treaties continued to be the chief obstacle to friendly relations. A tariff agreement, however, based on the most-favored-nation principle, was signed with Hungary in 1927.

In 1928 negotiations were begun looking to the broadening of the scope of the Little Entente agreement. Meetings of parliamentary representatives of the three countries were held to discuss an extension of the political understanding to other fields, particularly economic. In February, 1929, an economic conference of representatives of the three nations was held at Bucharest to prepare agenda for the spring meeting of the Little Entente in Belgrade. When this meeting was held, in May, no definite agreement was reached and up to the middle of 1929 the three countries were still only preparing the ground for possible future action. While the February conference was proceeding, a statement was issued by Czechoslovakia strongly opposing the proposed "anschluss," or union

between Austria and Germany, on the grounds that the international balance of power in Europe would be disturbed by the creation of so powerful a German state. On Jan. 26, 1929, President Masaryk signed, for Czechoslovakia, the Kellogg treaty outlawing war.

**CZECHOSLOVAK LITERATURE.** The problems which the Czechoslovak Republic has been called upon to face have been in many ways less complicated than those confronting some of her neighbors and this is reflected in her literature. In fact, any consideration of the Republic must start with her President, Thomas G. Masaryk, the philosopher statesman who has been able to steer the course of the country from the very beginning of the World War. His own writings, speeches, memoirs, and philosophical works, together with those of his associates, as Edward Beneš, play a very important part in the production of the country. Passing over these, it is in the field of lyric poetry that the Czechoslovaks have most distinguished themselves. There is a large number of poets many of whom have not become known abroad who have been of high standing. Among them we may mention J. S. Machar, and Viktor Dyk, both of whom were imprisoned by the Austrian government during the War. Among other poets were Antonín Sova and Otakar Theer. R. Medek was the chief poet produced by the Czechoslovak Legions in Siberia. Still others were Stanislav K. Neumann, Otakar Fischer, Jozef Chaloupka. Otakar Březina, a mystic poet of remarkable power, has practically stopped writing, although he remains one of the most significant figures in Czech poetry.

As regards Slovak poetry, Hviezdoslav (Pavel Országh), the foremost author, died in 1918 and his place has been taken, if not filled, by many of the younger generation, as the Rev. Ignac Grebač-Orlov, Jan Jesenský, Ludmila Podjavorinská, and others.

In the field of the novel, Czech literature suffered a great loss in the death of Karel M. Čapek-Chod in 1927. A profound pessimist, and at one time a man almost devoted to determinism of a particularly unpleasant kind, he was a master of psychology, and more than that he knew thoroughly the capital city of Prague. His novels, as those of Anna Tilschová, Alois Jiríšek F. Srámek, V. Vančura, and others, are at times of national rather than international appeal and for that reason they have not been recognized abroad as much as they should. This is not true of the foremost Czech author, Karel Čapek, the dramatist, not to be confused with the older novelist. His dramas, as *R. U. R.*, the *Insect Comedy*, and the *Makropoulos Affair* have gone into many foreign countries and his essays, as *Letters from England*, show that he has a real gift for satire. Karel Čapek is an author who questions the value of the machine world and constantly feels that mankind is in danger of becoming the victim of its own inventions. He is still a young man and he bids fair to become the leading author of modern Europe.

As regards Slovak prose, since the death of Svetozár Hurbán Vajanský in 1916, no outstanding figure has appeared with the possible exception of Milko Urban, who published the *Living Whip* in 1926. As elsewhere, the tremendous ferment of liberation encouraged a mass of production, but life is only now quieting down sufficiently for an atmosphere favorable to careful prose work to develop.

**D'ABERNON, EDGAR VINCENT.** See ABERNON, EDGAR VINCENT D'.  
**DADAISM.** A literary and artistic movement started by an international group of artists and writers who met at the Café Vol-

taire in Zurich during the World War. The manifesto of Tristan Tzara, the leader, was largely meaningless, some of the clearest passages being: "I am neither for nor against, and I do not explain, for I hate sense. . . ." "DADA means nothing." "We want works, straightforward, strong, accurate, and forever not understood. Logic is always wrong. . . ." The idea, which ended in senselessness, was to adapt the forms of literary and artistic expression to suit the trend of the times; because of the great need for something new after the War, and because of the eccentricities of the movement, such as holding meetings at which authors, in reading their works, tried to shout louder than a jazz band or a large electric gong, the Dadaists succeeded in holding public attention for several years after 1920, when their first meeting in Paris was held. Complete meaninglessness was the only rule—all who complied with this were hailed as Dadaists, and all were presidents. Dadaist poetry consisted largely of letters or syllables repeated in such a way as to make no sense, but usually so that some rhythm was retained. The tendency in the other arts was also to abandon traditional methods and forms, and there were even attempts to make it a political creed—a sort of super-anarchism. The name taken by the movement was given several origins: it was purposely devoid of sense; it was the name of a dead café singer; Tsara opened Larousse at random and a green hand pointed to the word Dada, which seemed to him a supreme title in that it glorified the first word the infant speaks as the highest art. Some of the chief members of the movement were Francis Picabia, André Breton, Philippe Soupault, Paul Morand, Georg Groz, Adolf Knoblauch, Richard Hülsenbeck, and Kurt Schwitters.

**DAEGER, ALBERT THOMAS (1872- )**. A Roman Catholic archbishop, born at New Vernon, Ind., and educated at Saint Francis College, Cincinnati, and in several houses of the Friars Minor. He was ordained to the Roman Catholic priesthood in 1896, and from that time until 1919 was connected with various churches in Missouri, Nebraska, and New Mexico. In 1919 he was consecrated Archbishop of Santa Fe, N. M.

**DAFOE, JOHN W. (1866- )**. A Canadian journalist (see Vol. VI). In 1919 he was the representative of the Canadian Department of Public Information at the Paris Peace Conference. He is the author of *Laurier: A Study in Canadian Politics* (1922).

**DAHLGREN, ULRIC (1870- )**. An American zoölogist born in Brooklyn, N. Y. He was educated at Princeton University, and was instructor in biology (1895-99), assistant professor (1899-1911), and professor of biology (1911- ) at Princeton. In 1921 he was di-

rector of the Mount Desert Island Biological Laboratory, Bar Harbor, Me. Professor Dahlgren published (with Kepner) *Principles of Animal Histology* (1908), *Production of Light by Organisms* (1915), and various shorter papers, mostly on electric and luminous organs of fishes.

**DAHOMEY.** A French colony on the west coast of Africa between Togoland and British Nigeria, forming part of the Government General of French West Africa. Its area is 42,460 square miles and its population in 1925 was 979,609, of whom 900 were Europeans. The capital and chief business centre is Porto Novo, with an estimated population of 25,000. Other cities are Abomey, Whydah, and Kotonu. Palm kernels and palm oil are the products of greatest economic value. Cotton cultivation was successfully introduced in the central provinces. Imports in 1926 were 186,537,810 francs and exports, 181,704,213 francs. In comparing these with the 1911 imports of 10,524,531 francs and exports of 21,958,301 francs, account should be taken of the fall in value of the French franc during the period 1914-28. Germany's share of the palm-kernel trade was largely absorbed by Great Britain after the War. In 1926 the local budget balanced at 19,102,000 francs. The natives remained orderly during the War and many served in the carrier contingents doing duty in Europe and the Cameroun.

**DAIL EIREANN.** See IRELAND.

**DAINGERFIELD, ELLIOTT (1859- )**. An American painter (see Vol. VI), head of Permanent Art School, Blowing Rock, N. C. His work, as exemplified in "An Arcadian Huntress," is pervaded with poetic meaning. Among his later pictures, "The City That Never Was" and "Tower of Silence" were imaginative impressions of the Grand Canyon. In 1914 he published *Ralph Albert Blakelock*.

**DAIRYING.** The production and use of dairy products has continued to make steady advancement. The public has become better educated to a more complete realization of the food value of dairy products, and consumption has consequently been stimulated. Producers and dealers have come to exercise greater sanitary precautions in the production of milk and the manufacture of its products. Pasteurization now is almost universal in the milk supplies of the larger cities, the ordinances of many of the cities allowing no raw milk to be sold. The spread of contagious diseases transmitted in milk has been reduced to a minimum. The manufactured dairy products have become better known and more fully appreciated by increased advertising and by marketing products of more uniform quality and in a more attractive way. A wider use of brand names for advertising purposes is also employed. Cheese and ice-cream consumption has been tremendously increased in this way. It has been suggested that prohibition also played a part in the increased use of ice cream and milk drinks. United States Department of Agriculture estimates indicate that

the per-capita consumption of dairy products expressed in terms of whole milk has reached more than 1000 pounds a year.

The continued development of coöperative and other organizations of milk producers brought more independence in transactions with milk dealers and the receipt of better prices for milk. Since the first real stand of the dairymen against the dealers, in October, 1916, when the Dairymen's League of New York State declared a strike pending the adjustment of milk prices for the ensuing six months' period, many coöperative organizations were rapidly established and now control large businesses, some of them going so far as to buy milk plants and to manufacture various types of dairy products.

Along with the development of coöperative marketing associations, producers also progressed profitably in the development of cow-testing associations, bull associations, etc. Such testing made it possible to distinguish the profitable from the unprofitable cow and served to demonstrate the importance of high producers. The bull associations made it possible for owners of small herds to obtain the service of better bulls at a reasonable cost. Pure-bred-sire campaigns and advanced registry testing in the different breeds of pure-bred dairy cattle also showed much progress. The increases in the cost of labor and feeds occurring during the World War made it absolutely necessary that milk prices be increased accordingly. The soundness of the dairy business was clearly substantiated in its ability to survive the period of depression following the War and continue as a relatively stable industry without the serious disaster that occurred in so many other agricultural enterprises.

Two matters of recent importance to the dairy industry were the creation of the Bureau of Dairy Industry in the U. S. Department of Agriculture, in 1924, which practically amounted to the elevation of the Dairy Division of the Bureau of Animal Industry to a place of equal recognition with the other bureaus of the Department; and the holding of the World's Dairy Congress in the United States in 1923 and another in England in 1928. Representatives attended both congresses from the larger countries of the world and discussed research, education, health, and economics as related to dairying. Aside from the World Dairy congresses just mentioned, the Scottish Cattle Breeding Conference, held at Edinburgh, Scotland, in 1924, was international in scope and of considerable interest to scientists working on dairy-cattle-breeding problems. The National Dairy Council represents many phases of the dairy industry and is devoted to the promotion of health and child welfare through the education of the public in dairy matters, under the directorship of Dr. C. W. Larson, former chief of the Bureau of Dairy Industry.

**International Conditions.** During recent years, certain of the European countries which formerly produced large amounts of butter, cheese, and other dairy products for export, have in a measure regained their former place in the world's dairy-products market which they lost during the War, and, in addition, there was a spectacular expansion in butter production in the Southern Hemisphere. The butter exports of Denmark in 1927 were the largest on record, and exports of cheese from The Netherlands, the world's greatest exporter of cheese, increased

from an average of 127,000,000 pounds before the War to 186,000,000 pounds in 1926. The exports of butter and condensed and evaporated milk from that country were practically doubled in the last five years. Exports of dairy products from the Baltic states, including Latvia, Lithuania, Estonia, Finland, and Sweden, approximately equaled the pre-war figures. In fact, practically all the northern European countries showed substantial increases in butter surpluses during the last few years. Australian butter exports are setting new records every few years, notwithstanding periodic unfavorable weather conditions.

The United States has shown a rapid change from an exporting to an importing country since 1922. In terms of the milk equivalent of the various products, the United States Department of Agriculture calculated an import balance of dairy products in 1922 of 106,000,000 pounds, but in 1926 and 1927 this was increased to over 1,100,000,000 pounds, with the probability of not quite such a large balance for 1928. The following table giving the imports and exports of dairy products of the United States in recent years, indicates that this change has largely been brought about by a considerable increase in the amounts of cheese imported and a reduction in the amounts of canned milk exported. It is of interest that this import balance is being established, notwithstanding the increase in the tariff on butter from 8 to 12 cents per pound, which was made effective in May, 1926. Present tariffs on butter, cheese, and milk have not eliminated New Zealand and Danish butter, Swiss and Canadian cheese, and Canadian milk and cream from the United States, but they have maintained a higher price for these products to the producer's advantage.

#### IMPORTS AND EXPORTS OF DAIRY PRODUCTS OF THE UNITED STATES

Year	IMPORTS		Condensed, evaporated, and powdered milk and cream
	Butter	Cheese	
	lb.	lb.	lb. (c)
1918	3,726,437	55,589,582	10,904,998
1918	1,655,487	7,562,044	16,509,239
1919	9,319,368	11,332,204	28,755,780
1920	37,454,172	15,999,725	8,667,626
1921	18,558,888	26,866,404	5,293,631
1922	6,957,159	46,573,099	10,398,001
1923	23,741,247	64,419,788	8,489,414
1924	19,404,816	59,175,591	12,393,769
1925	7,212,013	62,402,706	9,375,513
1926	8,029,087	78,416,823	10,356,469
1927	8,459,741	79,796,042	7,668,291
1928	4,659,288	81,402,673	
		EXPORTS	
1918	3,110,777	2,654,315	16,473,782
1918	26,194,415	43,404,672	551,139,754
1919	34,556,485	14,159,721	852,865,414
1920	17,487,795	16,291,529	414,250,021
1921	8,014,787	11,771,971	299,171,766
1922	10,937,519	5,006,574	193,686,904
1923	5,845,814	8,831,821	196,701,738
1924	8,256,622	4,299,127	211,809,172
1925	5,342,740	9,190,054	151,411,603
1926	5,482,992	8,902,597	117,209,984
1927	4,343,142	3,410,353	106,353,520
1928	8,893,157	2,599,944	119,567,857

\* Quantity not given in Commerce reports of United States.

**Trends in Research.** Mineral and vitamin studies have had a direct bearing on the nutrition of dairy animals as well as on the studies of the nutritive properties of dairy products. Work on the importance of minerals in the rations of dairy cattle was intensively carried on by E. B. Forbes at the Ohio Experiment Station,

E. B. Hart at the Wisconsin Experiment Station, and E. B. Meigs of the U. S. Department of Agriculture. These investigations tended to show the difficulties of keeping cows producing large amounts of milk in a positive calcium balance, even when plenty of calcium was supplied in the ration. The significance of the legumes, more especially alfalfa, as an aid to the maintenance of a positive calcium balance was first suggested from the Wisconsin Station and was later corroborated by other investigators. The proper curing of the alfalfa used is essential to prevent the partial or entire destruction of the vitamin which aids calcium assimilation. The Pennsylvania and Minnesota Experiment Stations found that dairy calves unlike many other animals were able to make normal growth and produce young on rations lacking in vitamin B, due to their ability to synthesize this substance in their digestive tract from the action of the fermentation bacteria normally present. Cows were, however, unable to synthesize sufficient vitamin B for the maintenance of normal milk production.

In studies of milk secretion, the Maine and Missouri Experiment stations found that from 70 to 80 per cent of the milk produced at a single milking was present in the udder before milking started, while the balance was secreted from cells of the mammary gland as the stimulation from milking proceeded. The Illinois Experiment Station found that the fat content of the milk could be increased by feeds or rations high in oil, the oil itself being responsible, and not the additional energy supplied or the specific action of the feeds. The limiting factor in milk production, however, was the energy produced in the milk.

Much attention was given to the composition of ice cream and the effects of the various ingredients of the mix and changes in the portions of the fat, and milk solids-not-fat, on the quality of the finished product and on the overrun. The part played by pasteurization, homogenization, and other special practices in the manufacture of ice cream was likewise studied.

From experimental work conducted over a period of years at the New York Geneva Station, an atlas was prepared which contained 16 microphotographs of methylene-blue preparations of market milk and cream. By the use of this atlas, it was possible to determine the previous treatment of the sample; for instance, pasteurized and raw milk may be differentiated as well as milk which was handled in poorly cleaned utensils or which was improperly cooled.

**Bibliography.** A few of the more outstanding recent publications in dairying include: *Proceedings of the World's Dairy Congress* (London, 1928); W. W. Yapp and W. B. Nevens, *Dairy Cattle: Selection, Feeding, and Management* (New York and London, 1926); C. W. Larson and F. S. Putney, revised by H. O. Henderson, *Dairy Cattle Feeding and Management* (New York and London, 1928, 2 ed., rev.); P. Coche, *La Production Laitière en Danemark* (Paris, 1928); J. W. Gowen, *Milk Secretion* (Baltimore, 1924); *Fundamentals of Dairy Science*, a treatise by associates of L. A. Rogers (New York, 1928); O. Rahn and P. F. Sharp, *Physik der Milchwirtschaft* (Berlin, 1928); L. L. Van Slyke, *Modern Methods of Testing Milk Products* (New York and London, 1927, 3. ed., ser.); A. Miyawaki, *Condensed Milk* (New York and London, 1928); O. F. Hunziker,

*The Butter Industry* (LaGrange Ill., 1927, 2d ed.); L. L. Van Slyke and W. V. Price, *Cheese* (New York and London, 1927); G. D. Turnbow and L. A. Raffetto, *Ice Cream* (New York and London, 1928); J. T. Bowen, *Dairy Engineering* (New York and London, 1925).

**DALLAS.** The leading wholesale market and manufacturing centre of Texas. The population rose from 92,104 in 1910 to 158,976 in 1920 and to 217,800 in 1928 by estimate of the Bureau of the Census. The area is 28.7 square miles. The first step in carrying out the city plan which was adopted in 1910 was the erection of the Union Station costing \$6,600,000 and an interurban station costing \$1,000,000. This was followed by the removal of railway tracks from Pacific Avenue so as to create a new main thoroughfare in the downtown district. Recently, about \$1,500,000 has been expended annually for opening and widening major thoroughfares. Three bond issues, totaling \$37,000,000, have been voted for carrying out, over a period of nine years, such projects as the elimination of grade crossings; the opening and widening of streets; the development of parkways and boulevards; the erection of additional school buildings, an art gallery, and a municipal auditorium; the purchase of an airport; and the extension of water, drainage, and sewer systems. A bond issue of \$500,000 has also been voted for enlarging the Dallas Public Library and for building several branches. Dallas has spent about \$250,000 in developing its park system, which covers more than 4000 acres. In 1928 10,000 acres of overflow lands were being reclaimed for business and industrial development along the Trinity River at a cost of some \$6,500,000.

The value of building permits in Dallas increased from \$13,755,219 in 1920 to \$34,840,558 in 1925; in 1927 the value of permits issued was \$12,053,333. Of special significance is the theatre erected by the Dallas Little Theatre, an organization which successfully produces amateur plays. The assessed valuation of property in 1928 was \$254,288,075; the net indebtedness \$20,824,261. The factory output of Dallas has increased from \$116,100,150 in 1920 to \$107,890,000 in 1927. In 1925 there were about 700 manufacturing plants that employed 9412 persons and paid \$11,104,000 in wages. In 1927 the wholesale business of Dallas was estimated at \$840,000,000 and the retail business at \$255,000,000. Dallas is the home of the Federal Reserve Bank of the eleventh district; its bank clearings in 1928 amounting to \$2,775,501,000. There are 45 elementary public schools, 7 high schools, several private schools, and one university, Southern Methodist University. The State Fair of Texas, the largest State fair in the United States, is held annually in Dallas. Several million dollars are invested in permanent improvements. A special feature is the auditorium, seating 5000 persons, in which grand opera is presented.

**DALLIN, CYRUS EDWIN** (1881- ). An American sculptor (see VOL. VI). He has in recent years continued his impressive Indian subjects in such works as "The Hunter" (1915), Arlington, Mass.; "Massasoit" (1921), Plymouth, Mass., and "The Last Arrow" (1923). He has succeeded also in the domain of historical sculpture in works like "Anne Hutchinson," State House, Boston, and the impressive relief, "Signing the Compact," Provincetown, Mass.

**DALMAN, GUSTAF HERMANN** (1855- ). A German Orientalist, professor of Old Testa-



ment Exegesis at the University of Greifswald (see VOL. VI). In 1917, he was appointed professor in the University of Greifswald, and in 1918 he became *Geheim-Konsistorial-Rat*. His works published since 1914 include: *Die Kapelle zum heiligen Kreuz und das heilige Grab in Gorkitz und in Jerusalem* (1915); *Orte und Wege Jesu* (1921); *Das Grab Christi in Deutschland* (1922); *Jesus-Jeschua; Die drei Sprachen Jesu; Jesus in der Synagoge, auf dem Berge, beim Passahmahl, am Kreuz* (1922); *Hundert deutsche Fliegerbilder aus Palästina* (1925); and *Arbeit und Sitte in Palästina* (1927).

**DALMATIA.** See Fiume-Adriatic Controversy.

**DALRYMPLE, LEONA** (MRS. C. ACTON WILSON) (1884- ). An American author. In 1914, she won a prize of \$10,000 for her novel, *Diane of the Green Van*. Among her other stories are *Tramerei* (1912); *The Lovable Meddler* (1915); *Jimsy, the Christmas Kid* (1915); *When the Yule-Log Burns* (1916); *Kenny* (1917); "Paul" stories (1920); *Fool's Hill* (1923), and *A Fool's Bells* (a play, 1925). She also has written short stories for magazines, and moving picture scenarios.

**DALTON, ALBERT CLAYTON** (1867- ). An American army officer, born at Lafayette, Ind. He entered the United States Army as a private in the 25th Infantry in 1889 and was promoted second lieutenant two years later, and by successive advancements became brigadier general in the Quartermaster's Department in 1922. His services included participation in the campaigns against the Cheyenne Indians in 1890 and the Sioux in 1891; and in the Santiago campaign in 1898, as well as in the Philippines during 1899-1902, and on the Mexican border in 1916-17. During the World War, he organized the Army Transport Service from New York (1917-18) and in 1919 he was in France commanding the 9th Division. He received the Distinguished Service Medal for his services. He was assistant quartermaster general at Washington, 1922-26, and after 1926 was president and vice president of the U. S. Shipping Board Merchant Fleet Corporation. He is a graduate of the Infantry-Cavalry School (1895), the General Staff School (1920), and the Army War College (1921).

**DALTON LABORATORY PLAN.** See EDUCATION IN THE UNITED STATES.

**D'ALVIELLA, däl-vyél'lä, COUNT GOBLET.** See GOBLET D'ALVIELLA, COUNT EUGÈNE.

**DALY, THOMAS AUGUSTINE** (1871- ). An American writer born in Philadelphia, Pa. He was educated in the public schools and at Villanova College, Pa., and also attended Fordham University to the close of his sophomore year. He was associated with several newspapers, among them the *Catholic Standard and Times*, Philadelphia, and the *Evening Ledger* and Philadelphia *Record*. He is the author of the following books: *Canzoni* (1906); *Carmina* (1909); *Madrigali* (1912); *Little Polly's Pomes* (1913); *Songs of Wedlock* (1916); *McAroni Ballades* (1919); and two prose works, *The Wissahickon* (1922) and *Herself and the Houseful* (1924).

**DAMPT, JEAN (BAPTISTE AUGUSTE)** (1854- ). A French sculptor, born at Venarey (Côte-d'Or). After studying at Dijon, he came under the influence of Jouffroy in Paris, and in 1879 under that of Dubois. He then specialized in Italian art from 1882 until 1883. He exe-

cuted a statue of Diana and Actæon in 1887, but his popularity is due to his later work in gold and silver, and to his plaster statuettes. His sculptures are represented in the Musée du Luxembourg, by *Saint Jean Baptiste*, and in the museum at Dijon. Dampy is a member of the Académie des Beaux Arts.

**DAMS.** The period since 1914 has been marked by the construction of the greatest dams the world has ever known. Indeed, in 1929 designs were under way for even greater works than had existed and it would appear that the maximum size of dam which can be built is merely a matter of funds to meet its cost. At the beginning of the twentieth century, a dam 100 feet high was a high dam. Today, at least two projects call for dams 550 feet high. In 1900, when the Assuan dam on the Nile was under construction, 6400 feet long, it was rightly considered as one of the engineering wonders of the world. While it still retains its position as one of the longest, if not the longest, dam in the world, several others have been built which approach it in magnitude. Earth dams have grown from heights of 100 to 250 feet or more in extreme height. Of course, this remarkable activity in dam construction simply reflects the great economic demand for water facilities. Water supplies for domestic use, for irrigation, and for power have been so essential to modern life that the engineer has been called upon to build works of constantly increasing magnitude.

The period of service or estimated life of the structure, available funds, location, and particularly the foundation conditions, have been the determining factors in the choice of the type of dam built. The older gravity-masonry dam and the newer arch dam, the earth- and the rock-fill dams, as well as several still later forms such as reinforced concrete, slab, arch or dome types, are in use today. Timber dams are practically obsolete and the ill-fated steel dam has never been revived after its early failures.

In modern designs, particularly in America where labor is very costly, there has been a tendency toward reducing sections and taking chances on foundations. The recent warnings such as the St. Francis failure and several earth-dam slips have, however, caused a halt in this trend. It seems probable that the maximum in base pressure in masonry and on slopes in earth-dam design has about been reached, and that the future will witness a return to more conservative construction. In some cases at least, these recent difficulties have led to legal requirements and government approval of designs and projects for dam construction. It is quite possible that additional legislation may be forthcoming to hold in check the few engineers who succumb to the heavy pressure so frequently put upon them to reduce cost with the result that taking a chance ends in disaster.

**Gravity-Masonry Dams.** Where a long period of service is anticipated and where funds are available, this type of dam still retains premier honors as the most conservative, safest and long-lived type of structure. The St. Francis dam failure in 1928 in no way reflected on the well-established methods of calculation and design of the gravity dam. It simply showed again what has been known for many years, namely, that the gravity dam requires a foundation of equal quality to the masonry of the dam itself if the work is to be a proper con-

struction of this type. High gravity dams must be founded on solid rock. This often requires deep and costly excavation to clear out the foundation down to solid material. Furthermore, the deeper the foundation the higher the dam becomes and the greater its thickness. Hence, deep foundations mean costly construction. Economic pressure tends to use every means to reduce cost and the temptation to avoid excavating to solid rock, thus taking a chance, has sometimes proved too great to resist. It is also true that some dam sites do not afford suitable foundations at any depth for this type of dam. This, indeed, was probably the case at the St. Francis site. Topographic conditions are only one of the elements which make a true dam site—another equally important item involves a consideration of the geological features.

Recent years also have witnessed another important and perhaps dangerous trend in gravity-dam design. In the earlier days of masonry-dam design, a base pressure of 10 tons per square foot was considered reasonable. In the first great American gravity dam, the New Croton Dam (1892-1907), a maximum of 14 tons was allowed. For the Kensico Dam (1910-17), a very conservative design, the same figure was adopted. In the meantime, however, the pressure on the Arrowrock Dam (1912) had been allowed to go as high as 30 tons per square foot and several other successful designs with similar pressure were built. In 1928 the U. S. Reclamation Service proposed to design the huge Boulder Canyon Dam (550 ft. high), using 40 tons per square foot. An increased pressure of course results in a thinner section, in a saving in material, and a reduction of cost. That the early figures were unduly conservative is true, but it is significant that the report of a special commission, appointed by President Coolidge to review the Boulder Canyon project, recommended that 30 tons be adopted as the maximum in the design of this dam.

#### IMPORTANT HIGH GRAVITY-MASONRY DAMS

Name	Date	Depth of water (feet)	Maximum Height above foundations (feet)
New Croton (U. S.)	1892-07	150	297 (straight)
Lake Chresman (U. S.)	1900-04	...	232 (curved)
Wachusett (U. S.)	1900-06	...	228 (straight)
Oattract (Australia)	1902-08	150	192
Roosevelt (U. S.)	1905-11	240	280 (curved)
Olive Bridge (U. S.)	1907-17	210	252 (straight)
Kensico (U. S.)	1910-17	150	307
San Antonio (Spain)	1914-17	269	269 (curved)
Gamarasa (Spain)	1918-20	302	335
Don Pedro (U. S.)	1921-28	288	...

**Kensico Dam.** This structure, completed in 1916, is remarkable in several ways. It is a large dam, 307 ft. maximum height, unusual provisions were made in its design, its design has received more attention from the aesthetic standpoint than any other structure of its kind, and its construction was notably novel and rapid. The Kensico Dam forms a reservoir which occupies practically the entire watershed of the Kensico River—a small stream. It is an emergency reservoir on the Catskill water-supply system for New York City and holds a supply which would suffice for over a month should it be necessary to shut off the aqueduct for repairs. The valley below the dam is thickly built up with high-class suburban dwellings, and it was obvious that the dam had to be safe beyond all shadow of doubt. For this reason, all possible

forces were taken into account in the design. In addition to the usual water pressure acting from flood level (elevation, 360 ft.) against the back face of the dam down to the foundation level (lowest elevation, 70 ft.), allowance was also made for a possible ice thrust of 23.5 tons per linear foot acting at normal full-water level (elevation, 355) and for an upward pressure on the base varying from that due to two-thirds of the full hydrostatic pressure on the upstream face to zero at the downstream toe.

While many great dams have been built without any expansion joints, or as they should more properly be called, contraction joints, special provision was made in the Kensico dam for such joints. At intervals of 75 feet, joints extend entirely through the structure. The entire problem of shrinkage in large masses of concrete, the effect of contraction due to cooling after setting (the chemical action accompanying the setting of ordinary Portland cement causes a rise in temperature of 35 to 45 degrees above normal), and the effect of general temperature changes are all somewhat debated points in mass-concrete design which have been recently receiving much attention.

In planning for the construction of the Kensico Dam, the contractors, who took the contract for \$7,953,050, adopted a plan of construction using stiff-leg derricks fed by construction railroads running along the axis of the dam, instead of relying on the usual cableways. This scheme permitted much more rapid construction, and the dam was completed far ahead of schedule time. Almost a million dollars was spent on the plant for this construction. It was one of the first big jobs in which electricity was widely used, practically all the plant, except the locomotives used in hauling, being electrically operated with power transmitted some 15 miles from New York City. The contractors were also fortunate in finding a good market for their equipment after the completion of the dam—at the beginning of America's entry into the World War.

**The St. Francis Dam Disaster.** On the night of Mar. 12-13, 1928, the ends, or wings, of this 205-ft. high-arched gravity type of concrete dam, gave way, bringing death to some 450 people in the valley below, sweeping away a power house, bursting an aqueduct, and doing damage to roads, railroads, farms, etc., to an extent of millions of dollars. A central portion of the dam, about 100 feet long (the total length was 650 feet) remained standing, but both wings were wrecked by the release of the 38,000 acre-feet of water held in the reservoir, and the torrent, said to have been 100 feet deep, carried huge portions of the structure almost half a mile down the valley.

The dam was located in the San Francisquito Canyon about one and one-half miles above Power House No. 2 of the Los Angeles Municipal Power Bureau and roughly 45 miles north of the City of Los Angeles. Completed early in 1926 and built to provide storage for the Los Angeles aqueduct water for use in years of deficient run off, it was practically full at the time of failure. Although some seepage had occurred around the dam, an investigation the day before the disaster showed clear water with no indication of erosion.

In general, the reports of the many committees which investigated the failure agree in stating that the dam was of ample cross-section and was built of good materials, so that its failure

in no way reflects on the safety of this type of structure when built on adequate foundations. On the other hand, a fault, classed as dead and in which no movement took place at the time of failure, passes through the dam site and results in the adjoining rock masses being badly shattered. These rocks consist of a mica schist of very poor quality and a rock described as red conglomerate and supposed to have been formed of gravel loosely cemented with gypsum. Both materials, particularly the latter, have been found to soften under water. It is difficult, therefore, to state positively that any type of dam would have been absolutely safe at this site and it is even more clear that it was not a suitable foundation material for the gravity type which requires a solid bed-rock base due to the high and unequal pressure exerted by this particular type of dam on its foundation.

**Hetch Hetchy Dam.** Another important dam for domestic water supply is this structure located on the Tuolumne River, California, about 250 miles east of San Francisco, and at an elevation greater by 3600 feet. It was built as a straight cyclopean masonry-gravity section dam 600 feet in length with a siphon spillway. From the crest of the dam to the lowest excavation, it was 311 feet in height, and the dam rises to a height, above stream level, of 212 feet, there being an average excavation of 72 feet.

**Don Pedro Dam.** The highest curved gravity type of dam in the United States, and in fact one of the highest dams of any kind was completed in 1923, across the Tuolumne River in California. This dam was built on a simple curve with a radius of 675 feet and a height of 283 feet above stream bed. It is 1040 feet long on the crest and contains 282,000 cubic yards of concrete masonry. Spillway openings with a capacity of 100,000 second-feet are provided by means of 10 gates, each 58 feet long and weighing 22 tons. These gates sink into the lip when not in use and can be raised to increase the reservoir height by nine feet. There was also a power house built at the toe of the dam which was equipped for an initial capacity of 150,000 horse power. The Don Pedro Dam forms a reservoir four miles above the La Grange Diversion Dam for the joint use of the Turlock and Modesto Irrigation districts in the San Joaquin Valley, California. Its estimated cost was about \$4,-

000,000. The reservoir when full covers an area of 3068 acres, having a capacity of about 280,000 acre-feet. This dam is located about 60 miles below the Hetch Hetchy Dam of the San Francisco water-supply project.

**Wilson Dam.** The Muscle Shoals project to develop power by a dam across the Tennessee River was an important war-time undertaking put under way in 1918. The Wilson Dam—Dam No. 2 across the Tennessee—was a structure of the overflow type about 4600 feet in length from bank to bank and about 96 feet high from bed rock to pool level. It not only would supply power but would render adequate depth of water for navigation of the Tennessee River. The dam was founded on solid rock with two tandem locks, excavated in solid rock, 60 feet wide by 350 feet in length at the north end of the dam, each giving a lift of about 45½ feet and affording a minimum depth over mitre sills of 7½ feet. The spillway section of the dam is 2660 feet in length, and over its crest rise 8-foot piers which support a concrete arch bridge. In the 58 openings between the piers are vertical steel sliding-crest gates 18 feet high and 38 feet wide, which are sufficient to pass a flood 75 per cent greater than the highest ever known on the river without any appreciable rise in the upper pool level. The heel trench is 35 feet wide and is carried down below the base of the dam so as to give a minimum breast wall of five feet without any seams.

The power house proper is located in a section of the dam about 1200 feet long, which is a continuation of the spillway section and includes a building for housing the generating machinery. Here were to be installed at the beginning four 30,000-h.p. turbines, although power was available to generate from 300,000 to 375,000 h.p., and provision was made for a corresponding installation of turbines. This dam contains nearly 1,000,000 cubic yards of masonry and is one of the largest dams ever built as regards its volume. See **MUSCLE SHOALS**.

**Dams of U. S. Reclamation Service.** Some of the most important dam construction in the United States has been carried on by the United States Bureau of Reclamation, and its engineers have developed designs in which most of the leading types have been represented, as will

DAMS CONSTRUCTED BY THE UNITED STATES BUREAU OF RECLAMATION WITH HEIGHT OF 50 FT. OR MORE

Name and state	Height	Type	Crest Length (feet)	Volume (cu. yd.)
Arrowrock, Idaho	349	Rubble concrete arch, gravity	1,100	585,180
Shoshone, Wyo.	328	Rubble concrete arch	200	78,576
Elephant Butte, N. Mex.	306	Rubble concrete, gravity	1,675	619,000
Roosevelt, Ariz.	280	Rubble masonry arch, gravity	1,125	842,325
Pathfinder, Wyo.	218	Broken range masonry arch	432	60,210
East Park, Colo.	189	Concrete arch, gravity	250	12,000
Sun River, Mont.	132	Concrete masonry arch	212	6,200
Lahontan, Nev.	124	Earth and gravel fill	1,400	770,000
Belle Fourche, S. Dak.	122	Earth fill	6,200	1,600,000
Cold Springs, Oreg.	98	Earth and rock fill	3,800	789,500
Minidoka, Idaho	86	Rock fill, concrete core	987	242,500
Clear Creek, Wash.	84	Concrete arch	404	4,100
Sherburne Lakes, Mont.	83	Earth embankment	1,133	201,500
Willow Creek, Mont.	78	Earth fill	525	196,400
Strawberry, Utah	72	Earth fill, concrete core	488	108,415
Lake Keechelus, Wash.	70	Earth and gravel fill	6,500	689,000
Upper Deer Flat, Idaho	70	Earth fill	4,000	1,190,275
Willwood, Wyo.	70	Concrete ogee weir	320	22,119
Oconouly, Wash.	67	Hydraulic earth fill	1,000	854,242
Jackson Lake, Wyo.	67	Concrete-gate section and earth fill	4,450	345,400
Minatare, Neb.	65	Earth fill	3,700	570,000
Lake Kachess, Wash.	63	Earth and gravel fill	1,400	193,800
Lake McMillan, N. Mex.	55	Earth and rock fill	2,070	150,744
Avalon, N. Mex.	50	Earth and rock fill, concrete core	1,880	168,773
Balston, Wyo.	50	Earth fill	150	24,740

appear from the accompanying table giving a summary of United States dams of over 50 feet built by the Reclamation Service. Up to the end of 1923, the Bureau had built three dams over 300 feet high, two dams between 200 and 300 feet, four dams between 100 and 200 feet, and nearly 100 dams ranging from about 2½ to nearly 100 feet in height. In 1924 there were six dams under construction, the most important of which were the Tieton River Dam in the State of Washington, with an estimated volume of 185,000 cubic yards, and a height of 244 feet (maximum height to the bottom of the core wall is 321 feet); the McKay Dam in the State of Oregon with an estimated volume of 2,300,000 cubic yards and a height of 159 feet; and the Black Cannon Dam in Idaho with an estimated volume of 74,500 cubic yards and a height of 153 feet.

The Arrowrock Dam near Boise, Idaho, built by the United States Reclamation Service in the interval between 1910 and 1916, has a height of 340 feet, and is 1100 feet long on the crest. It is built of concrete with large stones imbedded in the concrete. The total volume, including the spillways, is 610,600 cubic yards. Another high masonry dam constructed by the United States Reclamation Service was the Elephant Butte Dam across the Rio Grande, 120 miles above El Paso, Texas. This dam, which was finished in 1916, has a height of 306 feet above bedrock, and contains 605,200 cubic feet of concrete.

**Boulder Dam.** The United States Reclamation Service in 1924 proposed the improvement of the Colorado River Basin so as to provide adequate flood control, the impounding of water for irrigation, the storing of water for generating electric power, the provision of an all-American canal for supplying the Imperial Valley with irrigation water, and a possible future source of domestic water to supply California cities. An essential element of the project is the construction of a dam across the Boulder Canyon, raising the water surface 550 feet, a height equal to that of the Washington Monument, and twice that of the Don Pedro Dam in California.

The proposed dam would contain about three times as many cubic yards of masonry as the Assuan Dam in Egypt, which with 1,179,000 cubic yards had a record for the greatest amount of masonry of any dam yet constructed, though it was exceeded by the Wilson Dam with 1,291,385 cubic yards. The Boulder Dam would cost about \$50,000,000 or 2½ times as much as the Assuan Dam. It would provide a reservoir over 100 miles long with an area of about 150,000 acres, or 50 per cent greater than that of Gatun Lake on the Panama Canal. This reservoir would have a capacity of 26,000,000 acre-feet, over 6 times as great as that of Gatun Lake and about 10 times as great as that of the Elephant Butte Reservoir in New Mexico, the largest in the United States.

The dam as recommended in the Fall-Davis report, submitted in 1922, would begin 150 feet below the bed of the river, and would rise to a height of 605 feet, being 1350 feet long and 650 feet thick at its base. The so-called Boulder Canyon Dam Bill was not passed and signed by the President until late in 1928. In the meantime, the project had taken more definite form. The height was reduced to 550 feet. Special provision for floods was planned by

means of three diversion tunnels 35 feet in diameter in the solid rock of the canyon, which would by-pass the site of the dam. Even these estimates required modification according to the report of a special commission of experts appointed by President Coolidge late in 1928.

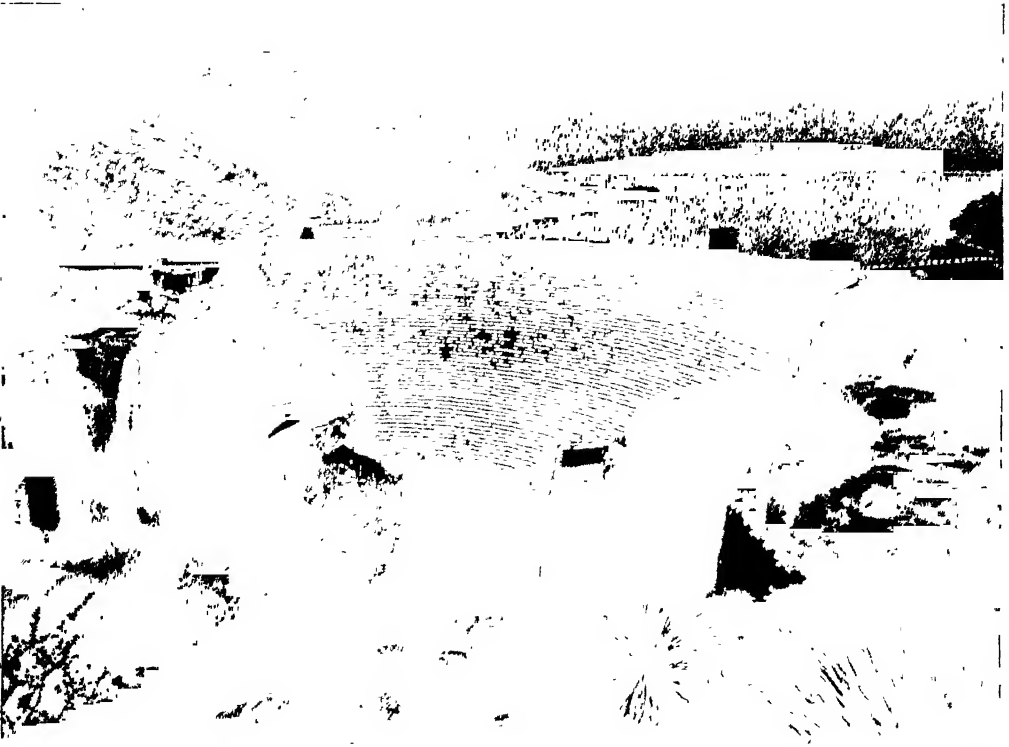
As finally passed, the Boulder Canyon Bill has certain requirements as regards approval by the several States concerned, refunding the cost of the all-American canal and securing a contract for the sale of the 1,000,000 horse power to be developed on favorable terms, which must be met before construction is begun. The cost was estimated at \$165,000,000, of which some \$70,000,000 was for the dam, and the bill carried an authorization for this sum to be advanced by the United States Treasury if and when the required conditions are met.

**San Gabriel Dam.** The Los Angeles Flood-Control District called for bids in November, 1928, for the construction of a high dam at the forks of the San Gabriel Canyon. This project has as its object the relief of flood conditions and the plans had been held up for over three years pending arrangements for financing. The dam site is about 30 miles east of Los Angeles at the forks of the San Gabriel River and the dam, a very high structure (425 feet above stream bed and about 500 feet above foundations) will be of the gravity-arch type. A storage capacity of 240,000 acre-feet will be developed and almost 3,800,000 cubic yards of concrete will be required (about three times the quantity used in the much discussed Muscle Shoals Dam). Irrigation water being much in demand in the area below the dam it is planned to serve for this use as well as for the primary purpose of flood relief. With this end in view, the lower 157,000 acre-feet will be used for impounding water for irrigation while the upper 83,000 will be held available at all times for flood relief through storage.

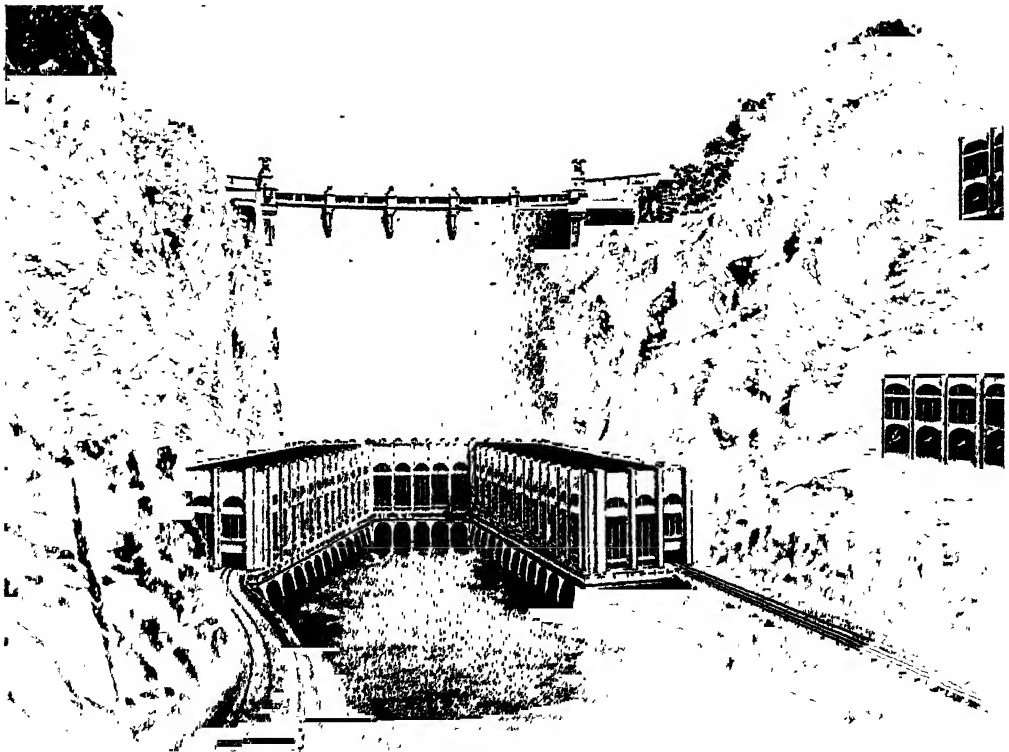
**Owyhee Dam.** At a point known as the Hole in the Ground about 21 miles southwest of Nyssa on the Union Pacific Railroad, the U. S. Bureau of Reclamation is planning to build a remarkably high gravity-arch type dam. A reservoir will thus be formed which will have a total capacity of 1,120,000 acre-feet and will form the principal storage for the Owyhee Reclamation Project embracing some 120,000 acres in eastern Oregon and western Idaho. Steep canyon walls permit a comparatively short dam, in the main portion about 300 to 500 feet with a top length of between 800 and 900 feet, to be carried up to the remarkable height of 520 feet above the lowest concrete of the deep foundation cut-off or an average of 390 feet above the general foundation level. Contraction joints will be placed at intervals of 50 feet in the length of the dam and inspection galleries will be provided in the body of the structure which will be 20 feet thick at the top and probably about 300 feet at the base. Following, as this work does, the St. Francis disaster, great attention has been paid to investigations of the foundation and experts have agreed upon this point. Work will be under way in 1929.

**Roller-Crest Dam.** The Grand River Dam, completed in 1915 to form a diverting structure of the high line or main canal project, was a pioneer American roller-crest dam. It is a steel roller crest surmounting an ogee gravity spillway section, with a sluiceway and a canal intake of a capacity of 1425 cubic feet per second at its

## DAMS



**ROOSEVELT DAM, SALT RIVER PROJECT OF U. S. RECLAMATION SERVICE, ARIZONA**



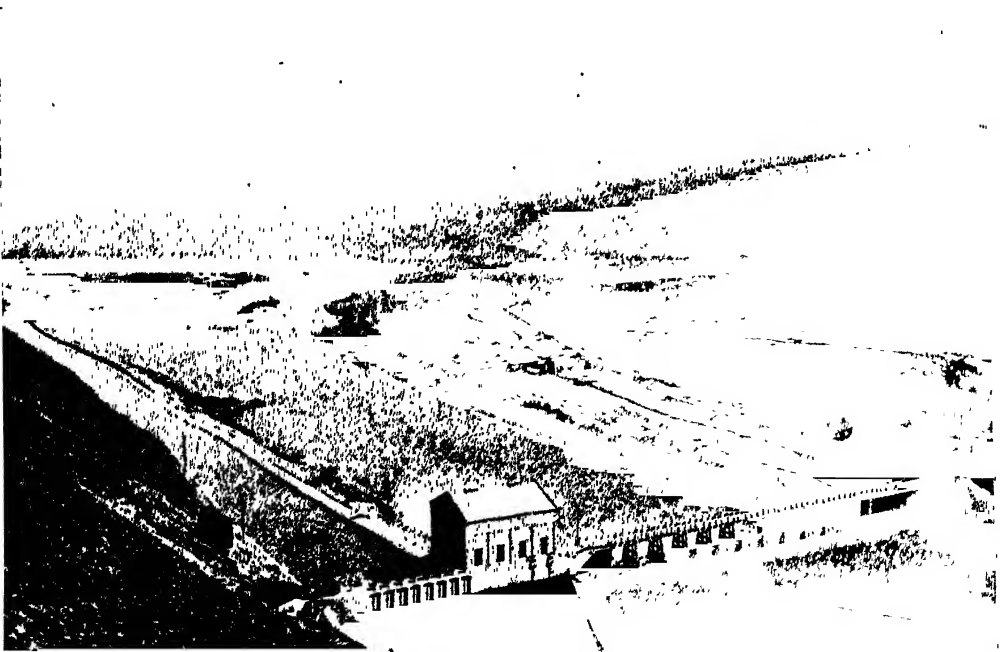
**SKETCH OF THE PROPOSED BOULDER DAM ON COLORADO RIVER**



## DAMS



ELEPHANT BUTTE DAM, RIO GRANDE PROJECT OF U. S. RECLAMATION SERVICE



BOISE RIVER DAM AND POWER HOUSE, BOISE PROJECT OF U. S. RECLAMATION SERVICE, IDAHO

west end. By means of this roller crest, the entire upper 10 feet of the dam can be raised above high water so that the elevation of the back water surface with low stream flow may be maintained at full height, yet the crest may be rapidly cleared to pass flood flows. The canal intake is controlled by nine regulator gates each 7 feet square. In front of the intake head walls is the sluiceway, 60 feet wide and 225 feet long. The dam proper consists of six sections, each 70 feet wide, or a total of 420 feet.

The roller crests consist each of a hollow steel cylinder, each 74 feet,  $9\frac{1}{4}$  inches long, and 7 feet,  $1\frac{1}{4}$  inches in diameter, the ends projecting about  $2\frac{1}{2}$  feet into recesses in the piers and rolled on smooth tracks at an angle of 20 degrees with the vertical, while a toothed rim engages in a toothed rack. The hollow cylinder axle and the required height of the crest are obtained by fastening to the cylinder an extension shield which rests on the sill when the roller is down, thus forming the bottom seal. There is also a roller crest at the sluiceway of essentially the same design but of different dimensions.

**Spanish Dams.** Spain, the home of the earliest existing dams of the gravity type, has been the scene of some remarkable recent dam construction. These works have been primarily for power purposes and have established the record heights for the Continent of Europe.

The San Antonio Dam was built in 1914-17 in Tremp, in the Spanish Pyrenees across the Noguera Pallaresa River, by the Ebro Irrigation and Power Company. It is located in a narrow gorge and is 269 feet high above foundations. In plan, this dam is curved, the radius of the upstream face being 300 meters. While the crest of the dam is only 666 feet long, it is an interesting structure because of its height and the special control gates and provisions for discharging floods. It is also typical of this type of construction in Spain.

The Camarasa Dam was built by the same company, across the same stream and for the same purposes, that is, combined use for irrigation and storage, as the San Antonio Dam. This dam built during 1918-20 when finished was not only by far the highest dam in Europe but also the highest gravity dam in the world. It rises to a height of 333 feet from bed rock to crest, and contains 285,000 cubic yards of cyclopean concrete. It is 270 feet wide at the base and 13 feet wide at the crest, which is widened to 21 feet to provide a roadway and foot walk along the top, whose length is 460 feet. This dam is of gravity section and is arched on a radius of 1000 feet. It forms a reservoir which supplies a head of water so that, at the power house, some 88,000 horse power is generated. The dam was built in a very narrow part of a deep gorge, so that it was necessary to place the spillway adjacent to the south abutment of the dam, and the headworks controlled the flow to the power house on the opposite side at the north abutment. At the power house, located below the dam, the total head of 270 feet was developed.

**Sukkur-Barrage, Bhatghar.** Construction began on one of the largest dams in the world in October, 1923, across the Indus River in the Province of Sind in India at Bhatghar, 35 miles from Poona. This dam forms a reservoir with a storage capacity of 551,000 acre-feet as compared with 1,070,000 acre-feet stored by the Aswan Dam in Egypt, and would provide water

for the irrigation of 6,000,000 acres of land, the entire project including about 850 miles of main canals and over 1200 miles with branch canals in addition to the dam, costing about \$50,000,000. The dam known as the Lloyd Dam, or Sukkur-Barrage, will be one mile in length and will be built of masonry using local limestone, with 66 arched openings of 60 feet each, provided with control gates. The height of the dam above the lowest foundation will be 185 feet and the height of the water above the sills of the lowest sluices will be 143 feet, a height which can be increased to 153 feet by means of gates in the waste weir. The masonry content of the dam will be approximately 800,000 cubic yards, and it will have two bridges on the top, the lower one directly over the water openings, carrying a roadway, while the other will be used for the machinery operating the gates. The Lloyd Dam takes the place of an older dam.

In connection with the Lloyd Dam, attention might be directed to the elaborate system of canals by which the water is distributed. The eastern canal at Nara is to be carried through a deep cut nearly double the width of the Suez, while the northeastern canal will be nearly 100 miles long and will have about 500 branches, being nearly as wide as the Suez Canal, and will irrigate more than 750,000 acres. The Central Rice Canal, which is the second largest, will be 87 miles in length, and will have 350 miles of branches. It will have a discharge equal to that of the River Thames.

**Arch Dams.** While many dams of the pure gravity type have been built curved in plan, instead of the usual straight top, this has been done simply as an increased factor of safety. On the other hand, certain locations have permitted the construction of true arched dams—practically horizontal arches or arches with the axis vertical. The deep narrow canyons of the western United States, with almost vertical side walls of solid rock, form the ideal site for this type of structure. Indeed it is an American development. Such construction permits a great reduction in the thickness of the dam section. Instead of a thickness at the base of two or even three hundred feet for high gravity dams, less than 100 feet may suffice for equally high arch dams. The Pathfinder Dam of the United States Reclamation Service (1905-10) and the Shoshone Dam, built at the same time by the same service, are notable examples of this type. The former has a maximum height of 210 feet and a thickness at the base of 94 feet while the corresponding figures for the latter structure are 328 feet and 108 feet.

This type of dam, properly designed, should be quite as long-lived and conservative a structure as a gravity dam, and it undoubtedly offers great economy of material. It has been quite widely used both in the United States and abroad and is such an important type today that special investigations have been undertaken to clear up disputed or uncertain points in arch dam design.

**Arch Dam Investigation.** In 1922 in the United States, the Engineering Foundation put under way a practical study and investigation of arch dams in order to learn as much as possible about their characteristics and performances in different conditions and temperature of depth of water in the reservoirs.

For the systematic investigation of arch dams, the committee appointed by the Engi-

neering Foundation in 1924, proposed to build a test dam 60 to 100 feet high, which was to be tested repeatedly during construction and under different conditions, and finally to destruction. The site selected was in Stevenson Creek, a tributary of the San Joaquin River, about 60 miles east of Fresno, Calif. This site was in conjunction with a U-shaped section, typical of many dam sites, and a stream gradient of about 25 per cent. It afforded a suitable foundation without an undue amount of stripping and was convenient and accessible. There was adequate water available derived from a tunnel from Shaver Lake which passed near by so that the reservoir formed by the test dam could be filled at will. This reservoir was not so large as to imperil life or property in case of the actual failure of the structure. This test dam was constructed, certain experimental results have already been secured, and the work is being continued.

**Hartebeestpoort Dam.** In September, 1923, the Hartebeestpoort Dam on the Crocodile River in South Africa was completed. This dam, situated about 23 miles from Pretoria, closes a gap in the Magaliesberg Range, and affords a reservoir with a surface area of about 6.7 square miles with a gross storage capacity of 136,241 acre-feet at spillway level, or 123,232 acre-feet above outlet level, having a drainage area of 1506 square miles, and an average annual rainfall of 26.34 inches. This dam is built of concrete in arch plan, 195 feet high, from the lowest foundation to the top of the solid parapet wall. It has a top radius of 240 feet on the up-stream face, and at the bottom the radius is 148 feet and 75 feet on the up-stream and down-stream faces, respectively, affording a thickness of 73 feet. From the bottom, elevation 3795, to elevation 3960, both faces have a batter of 1 in 5.714, above which point they are vertical giving a roadway along the top.

The height of the dam from the river-bed level to the elevation of the crest of the waste weir is 140 feet, with an approximate height flood level of 158 feet to the top of practically 163 feet. At the west side of the gap, there was a flat slope which required the construction of a long tangent abutment beyond which the spillway was cut in the rock and separated from the reservoir proper by a levee, or weir, 420 feet long. This spillway was 56 feet wide at this upper end and increased in width to 125 feet at the bottom where it is crossed by a concrete arched bridge. The channel so formed is lined with concrete and beyond its lower end below the dam the rock surface of the cliff is faced with gunite. On each side of the dam there is an outlet tower from which through pipes the water is passed into an open canal, whence it proceeds for irrigation purposes to the territory below the dam. As the main road from Pretoria to Rustenberg crosses the dam, it has been made particularly ornamental as regards its finish and that of the bridge towers.

**Montejaque Dam.** In 1924 there was completed a concrete dam of pure arch type in the Andalusian Mountains of Spain, which with a maximum height of 273 feet from the lowest portion of the foundation to the crest was the highest structure of the kind essayed up to that time on the Continent. It was built across a gorge of the Gaduares River, where the cliffs rise almost vertically, and was of variable radius increasing from 72 feet at the base to 123 feet

at the crest which, measured along the centre line, was 256 feet in length. Excavation was begun in July, 1923, and the crushed stone and sand were obtained from adjacent sources of supply. The completed structure contained 35,000 cubic yards of concrete and formed a reservoir containing 1,412,000,000 cubic feet of water. The design was the work of Swiss engineers who also supervised the construction.

**Special Types of Masonry Dams.** It is obvious that there are many locations either not suited to the construction of masonry dams of the gravity or arch types or where considerations of cost exclude these types or even an earth dam. The twentieth century has witnessed several new types of dams designed particularly to meet these conditions. The principal forms are the reinforced concrete slab-and-buttress dam, the multiple-arch dam and, still more recently, a multiple-dome type.

**Slab-and-buttress Dams.** The slab-and-buttress type was first brought forward by the Ambursen Hydraulic Construction Company of Boston in 1903. It consists of a series of triangular buttresses, 15 to 20 feet centres and at right angles to the axis of the dam, the up-stream, sloping faces of these buttresses supporting inclined slabs of reinforced concrete. The highest dam of this type which we know is the La Prêle or Douglas Dam at Douglas, Wyo. This structure, completed in 1908-09, to impound over eight billion gallons of water for irrigation purposes, has an extreme height of 150 feet and is 135 feet high above the original water level.

**Stony Gorge Dam.** This work, a U. S. Bureau of Reclamation project, illustrates a more recent use of this type of dam. It is 120 feet high of the usual slab-and-buttress design of reinforced concrete and is being built by the Ambursen Company. By 1929 the dam had been practically completed, and is on the Orland project in California. It will furnish a supplemental supply to 20,000 acres already under irrigation.

**Multiple-arch Dams.** Another type of dam, the multiple arch, is similar to the slab buttress, the principal difference being that the slab between buttresses is replaced by an arch. This has an advantage in that concrete in compression carries the load and reliance does not have to be placed upon tensile steel reinforcement, as in the slab type. It is in this way a more conservative and presumably a longer-lived structure. At the same time, the thrust of one arch must be balanced against the adjoining arches and the failure of one arch may thus leave unbalanced thrusts and result in the failure of adjoining sections. The new edition of Wegman's well-known book, *Design and Construction of Dams*, published in 1927, includes a special article of over 100 pages on this type of structure and illustrates clearly the increasing use of the multiple-arch dam.

One of the earliest dams of this type was the Hume Lake Dam built in 1908. This dam had 12 arches of 50-foot span and was 50 to 60 feet high. It was followed in 1910-11 with the New Bear Valley Dam, replacing the old pioneer arch dam built in 1884. The new structure is 91.5 feet high and has 10 arches of 32-foot span centre to centre of buttresses. In more recent years, this type seems to have replaced in large measure the slab type dam and numbers of multiple-arch dams have been built. The Sherman

Island Dam, built in 1925, consisting of 31 bays, 19 feet centre to centre of buttresses with a maximum height of 80¼ feet, is typical of this type of dam.

**Lake Pleasant Dam.** A more recent American structure of this type is the Lake Pleasant Dam, Arizona, completed in 1927. This is 2146 feet long and its height, 170 feet above stream bed, shows the inevitable increase in size with an increase in familiarity with the type among engineers and an increase in confidence as to its structural stability and design.

In order to secure a sufficient cross-section for stability without undue use of materials, the novel expedient of building the buttresses of hollow form was used in this dam. They were 60-foot centres and were built with double walls 16 feet apart for their full height and battered inside. The clear span of the arches is thus 44 feet, the upper side of the buttresses being closed by flat slabs. The up-stream slope is 9 horizontal to 10 vertical, and the arches are 3-centred with a thickness varying with the height. The unique construction and the great height, 252 feet maximum above foundations, make this one of the most notable dams of this type.

**Tirso Dam.** Completed in 1923 in western Sardinia, Italy, this multiple-arch dam 200 feet high, was the highest dam of this type in the world, being almost 70 feet higher than the Lake Hodges Dam, which had the record for height in the United States. The Tirso Dam had reinforced-concrete arches supported on cut-stone masonry buttresses and formed the main structure of a power plant generating some 30,000 horse power at maximum load and 10,000 horse power normally. The dam itself forms a reservoir with a surface area of 8.5 square miles, which has a storage capacity of some 330,000 acre-feet, and will furnish irrigation water to about 75,000 acres.

The Tirso Dam in southern Italy, built in 1923, was exceeded in height by a new dam built in the following year for the Suviana Reservoir on the Limentra di Treppio Brook in the Province of Bologna, which has a height of 286 feet, as compared with 213 feet for the Tirso Dam. This was a concrete multiple-arch dam built for the State Railways of Italy, so as to afford a storage capacity of 35,000 acre-feet, of which 29,000 acre-feet was to be utilizable storage.

In the development of water power in Italy, a number of concrete multiple-arch dams of large proportions had been constructed, though they did not have the height of the two dams mentioned. Thus, the Pavana Reservoir across the Limentra di Sambuca Brook, also in Bologna, was formed by a concrete multiple-arch dam 187 feet high, and had a storage capacity of 810 acre-feet.

**Gleno Dam Failure.** Among the more serious of recent dam failures was that of a European multiple-arch dam at Gleno, about 30 miles northeast of Bergamo in north central Italy, on Dec. 1, 1923, resulting in a loss of some 500 lives and property destruction estimated at 150,000,000 lire. This dam, which formed a reservoir of 190,000,000 cubic feet capacity, was a reinforced concrete structure of multiple-arch type 143 feet in height above the stream, 863 feet long on top, and of curved ground plan, with a central portion 250 feet in length flanked on either end by straight portion tangents to the central curve. The multiple-arch construc-

tion rested on a gravity base of stone masonry, being substituted without proper authority for the gravity dam for which official permission had been granted. The masonry base was 5½ feet high and some 250 feet long and carried the curved part of the superstructure, while the straight portions at the sides were built directly on the rock of the side of the valley. In all there were 25 arches of semi-cylindrical form, 26 feet 3 inches between buttresses and inclined 53 degrees to the horizontal.

At the time of the failure, eight of the arches of the curved portion of the dam, together with their buttresses, and the first arch of the tangent section on the left bank together with the heavy buttress at the point of tangency went out. This released a vast volume of water which passed down the steep and narrow valley of the Dezzo River, for 12 miles to its junction with the Oglio River at Darfo, and then down the Oglio Valley 5 or 6 miles to Iseo Lake at Pisogne. Power stations at Vilminore, Dezzo, Mazzuno, Angola, and Darfo, a number of factories, including the Valtre Steel Works at Darfo, and many houses and villages were destroyed by the flood. The failure of the dam was due to the faulty design and construction of the base. The execution of the work was badly performed and there was a failure to cut footings in the rock for the buttresses. Improper materials, badly mixed and poured, lax inspection and incompetent direction, all contributed to the disaster as was revealed in an official report published in 1924. It was believed that one outcome of the catastrophe would be the formation of a government department to pass on the design and construction of all dams as had been proposed previously by different Italian engineers.

**Coolidge Multiple-Dome Dam.** One of the most interesting and remarkable dams of a novel type ever constructed is this work on the Gila River in Arizona. It is an essential part of a project authorized in 1924 to irrigate some 100,000 acres, largely Indian lands adjacent to the Salt River Project in Arizona, and was built by the United States Indian Service. Several studies of different types of dam, together with estimates of their relative economy, showed a slight saving for the novel dome type over its nearest competitor, the well-known multiple-arch. Three egg-shaped half domes of 180-foot span and 251 feet high, with joining buttresses, form the main portion of the dam which is about 550 feet long with side spillways on either end 166 feet wide. It is claimed that this type offers advantages for certain sites and is subject to comparatively simple calculation. The domes vary in thickness from 4 to 20 feet and are reinforced for temperature changes, no expansion joints being provided except in the buttresses.

**Earth Dams.** In many cases, the provisions for passing floods over dams require that practically the entire dam be made a spillway. In such cases, the gravity-masonry type is usually used. On the other hand, the spillway portion of a dam may be comparatively small or isolated from the main dam structure. In these cases, particularly where suitable material is available and foundations for a gravity type would require deep and costly excavation, the earth dam may be used. Until recent years, the earth dam has been employed primarily for long low dykes or embankments. Such a dam over 100 feet high was very unusual. Today, there is an

earth dam 245 feet high. This progress has been due largely to improvements in the development of the hydraulic method of construction.

Earlier earth dams in the eastern United States were built by depositing the earth in layers and compacting by rolling. At the best, this is a costly method of handling the large yardage involved in such construction. On the other hand, such dams in the West were built by sluicing the fill, from banks located above the level of the dam, by hydraulic giants or nozzles, through high pressure jets of water against the banks. The water, brought down to the dam in sluices, frequently carried 25 or 30 per cent of solids which settled out under water in the lake or pond maintained on the dam site by building up the edges, along the slopes, with special heavy coarse fill. This method of moving earth is extremely cheap but can only be used in a location where suitable earth is available at a level well above the top of the dam.

The following table gives some of the recent notable hydraulic fill dams:

Dam	Spillway ht.		Total ht. above	
	above stream	stream bed	stream bed	stream bed
Cobble Mt., Mass. (1928)	215		245	
Tieton, Wash. (1925)	211		232	
Calaveras, Cal.	185		220	
Saluda, River	200		208	
Davis Bridge, Vt.	185		200	
Neacox, Mexico (1909)	164		192	
San Pablo	185		165	
Goose Creek, Idaho (1913)	187		150	
Paddy Creek, N. C. (1917)	120		130	
Gatun, Panama (1912)	78		120	

More recently it has been found economically possible to pump the liquid mixture of water, sand, and clay, from lower levels to the level of the work. Recent construction of earth dams of considerable height has, therefore, been almost entirely by the hydraulic fill method. Core walls of concrete have been very generally used, the function of the earth fills inside and out then becoming largely a matter of supporting this impermeable core wall. The stability of these slopes is a point of much importance and the several slips which have occurred in recent constructions seem to clearly indicate that the old ratio of 1 on 2 is not low enough for stability.

A record dam of the rock-fill-earth type is shown in the following table:

Dam	Spillway ht.		Total ht. above	
	above stream	stream bed	stream bed	stream bed
Dix River, Kentucky (1926)	245		275	

**The Wanaque Dam.** One of the most important of earth dams recently constructed in the eastern United States is this dam built to form a reservoir for the North Jersey water supply (Patterson, Passaic, Newark, and other cities). The dam closes a valley 1500 feet wide with rock outcropping on both sides but dipping 100 feet below ground at the bottom. A concrete core wall carries down to rock and the top of the dam is 92 feet above the original ground level. The principal interest attaches to the construction both of the core wall and the dam. The core wall was built in a sheeted trench 100 feet deep—a remarkable performance—and the dam, involving almost a million cubic yards of earth, was built by sluicing and compacting material brought to the site and distributed along the dam by a remarkable series of belt conveyors. The conveyors had a total length of nearly two and one half miles and constituted the largest

installation of this kind ever undertaken. An upstream slope of 1 on 3 was adopted with 1 on 2 reducing to 1 on 2½ downstream.

**Tieton Dam.** In order to provide a reservoir with a capacity of 205,500 acre-feet as a part of the storage system for the Yakima project, Washington, the United States Reclamation Bureau constructed an earth dam on the Tulon River about 26 miles above Naches, Washington, in the Mt. Rainier National Forest. This was an earth dam heavily blanketed with rock, approximately 230 feet high and 900 feet long on the crest, with a concrete core wall of an approximate height of 330 feet extended over solid rock to the crest. During the construction of the dam, a diversion tunnel 2200 feet long and of a diameter of approximately 21 feet was constructed to carry the waters of the Tieton River, and this work after the completion of the dam was to be used as a portion of the outlet control.

The embankment forming the dam consists of hydraulic fill blanketed with rock, having a maximum height of approximately 230 feet, a crest 900 feet long with a 3-to-1 slope on the upstream side, a 25-foot top width and a 2-to-1 slope on the downstream side. The material brought to the dam site from borrow pits in cars was washed into position by hydraulic giants to a central pool divided by the core wall. Here a pump was installed to pump a large amount of the soft clay material from the lower side of the core wall to the upper side, leaving a fine graded sandy material against the downstream side of the core wall and a clayey puddle against the upstream side of the core wall.

The volume of the embankment is approximately 2,000,000 cubic yards. In the rock cliff on the west side, a spillway was to be built with an overflow lip 420 feet long, equipped with six drum gates of the Arrowrock type, 65 feet long and 8 feet high. This spillway has a capacity under normal conditions of 30,000 second-feet and a capacity of 50,000 second-feet before the dam would be overtopped. It discharges through a concrete conduit down the side of the cliff to a pool well below the toe of the dam. The outlet control works operate to control the water at three stages so that the gates will never have to operate under a greater head than 80 feet. These outlets each have a capacity of 25,000 second-feet which will be the maximum of any irrigation dam.

**Cobble Mountain Dam.** This dam forms part of the additional supply system for the city of Springfield, Mass., being developed on Little River, a branch of the Westfield, west of the city and above the existing system. The dam is located in a narrow gorge and, although 1505 feet wide at the base (toe to toe) will be only 700 feet long at the crest. Some 22 billion gallons storage is expected and the lake will cover 1120 acres. A separate spillway 800 feet long is provided and a diversion tunnel, 1600 feet long, will be used to carry flood flows around the dam site during construction and later for an outlet to the dam. Another outlet tunnel, 7105 feet long and 9½ x 10 feet horseshoe section, will convey the water to a point lower down in the gorge at existing works giving a head of 450 feet for power development. Suitable material for the dam has to be hauled about one mile and will either be sluiced into place from "dissolving boxes" or placed by the



semi-hydraulic method of dumping dry at the outer edges and washing into place. It is expected that the work will be completed by October, 1930, and inasmuch as the dam will be 245 feet high above stream bed, it will be the highest earth dam in the world.

**Table Rock Cove Earth Dam.** That the stability of the earth embankments of a hydraulic-fill earth dam during construction needs careful observation and attention was amply demonstrated in the slide on the 180-foot Nexaca Dam in Mexico in 1909 and through other similar construction difficulties with this type. In the earth water-supply dam for Greenville, S. C., built in 1925-1927, however, another source of danger almost caused a major disaster. The dam was a rolled-fill embankment, not a hydraulic structure, and 140 feet high above foundations. A 42-inch drain pipe, used to divert the stream flow during construction, was closed by a valve at its lower end, at the downstream of the dam. A break in this drain which, of course, was under full water pressure, caused a large slide in the dam with the reservoir almost full. The dam held while the stored water was slowly drawn off.

**Dix River Rock-Fill Dam.** The record rock-fill dam, a western United States type, was built in 1923-1926 on the Dix River in Kentucky. In general, these dams have been built by first placing a rock fill across the stream. On the upper surface of this fill, a watertight diaphragm or apron is placed. In some cases, this has consisted simply of two layers of timber planking with waterproof paper between. Obviously a more or less temporary construction, this apron was frequently protected by an earth fill sloping upstream. In other cases, a sheet-steel diaphragm has been used. Reinforced concrete was obviously the ideal material, but due to the fact that rock fills of this type settle considerably, it was felt that a more flexible material such as timber or steel was indicated. Nevertheless, in the Dix Dam a reinforced concrete apron 18 inches thick has been employed. Almost two million yards of rock was blasted out near the dam and was dumped into the gorge between cliffs about 1000 feet apart. In this way, a barrier with slopes of about 45 degrees was built to a maximum height of almost 300 feet. On the upstream slope of this huge embankment, a heavy dry rubble paving was placed by derricks. Over this paving, the concrete facing or paving, furnishing the water-tight diaphragm, was built. Some 300,000 acre-feet of water, forming a lake 36 miles long, will be held back of this dam. It is part of the Kentucky Hydro-Electric Company's project for power development in this section and a new waterworks for Danville, Ky., also is involved.

**Bibliography.** Among the recent and more notable available works on dams are Wegmann, *Design and Construction of Dams* (8th ed., revised and enlarged, New York, 1927), which has a full bibliography of the available literature; Creager, *Engineering for Masonry Dams* (Rev. ed., 1929, New York, also translated into French); Morrison and Brodie, *High Masonry Dams* (2d ed., New York, 1916); Davis, *United States Irrigation Works* (Washington, D. C., 1917); Kammüller, *Die Theorie der Gewichtstaumauern* (Berlin, 1929). Most satisfactory, however, are the files of the *Engineering News-Record* (New York); *Reclamation Record* (Washington); *Engineering* (London); and *En-*

*gineer* (London), and *Transactions of the American Society of Civil Engineers* (New York, current), as well as *Reports, Chief of Engineers U. S. Army* (Washington, annual); and *Reports, Commissioner of the Reclamation Bureau* (Washington, annual). See WATER POWER; WATER SUPPLY.

**DANA, CHARLES LOOMIS** (1852- ). An American neurologist (see Vol. VI). He became professor of nervous diseases at the newly founded Cornell University Medical School, New York City, in 1902. In 1914-16 he was president of the New York Academy of Medicine. His *Textbook of Nervous Diseases* reached 10 editions by 1929. He also wrote *Peaks of Medical History*.

**DANA, JOHN COTTON** (1856-1929). An American librarian (see Vol. VI). He continued as head of the Newark, N. J., Free Public Library and director of the Newark Museum Association until his death, publishing *The Industrialist as an Artist* (1927); *Art is All in Your Eye* (1927); *Should Museums be Useful?* (1927); *Changes in Library Methods in a Changing World* (1927), and numerous other pamphlets and monographs.

**DANA, PAUL** (1852- ). An American editor (see Vol. VI). He was stationed at Namur from May to June, 1915, as a member of the Committee for Relief in Belgium.

**DANDURAND, RAOUL** (1861- ). A Canadian lawyer and statesman (see Vol. VI). He became minister without portfolio in Canada in 1921 and was president of the Sixth Assembly of the League of Nations. Mrs. Dandurand, his wife, was elected vice president of the National Council of Women, and was decorated by the French government for her literary attainments.

**DANDY, WALTER E.** (1866- ). An American surgeon, born at Sedalia, Mo. He graduated in arts at the University of Missouri in 1907 and in medicine at Johns Hopkins in 1910, later joining the Johns Hopkins faculty. In 1921 he was made associate professor of surgery, specializing in brain and spinal cord work along the lines inaugurated by Professor Harvey Cushing (q.v.). He contributed many important papers on the causes and mechanism, diagnosis, and surgical treatment of brain tumors, brain abscess, internal hydrocephalus, convulsions, etc., and introduced pneumography into routine use in the diagnosis of brain tumors.

**DANE, CLEMENCE (WINIFRED ASHTON)** (?- ). An English author, who wrote the following novels: *Regiment of Women*; *First the Blade*; *Legend* (1919), a novel composed chiefly of conversation which gives a striking revelation of character through its subtlety of method; *Wandering Stars* (1924); *The Dearly Beloved of Benjamin Cobb* (1927); and *The Babyons* (in four parts, 1928). She was an actress for four or five years and also wrote the following dramas: *A Bill of Divorcement* (1921); *Will Shakespeare* (1922); *The Way Things Happen* (1924); *Naboth's Vineyard* (1925); and *Mariners* (1927).

**DANIELS, JOSEPHUS** (1862- ). An American public official (see Vol. VI). He was Secretary of the Navy under President Wilson from 1913 to 1921, and from the beginning urged the establishment of a larger Navy. He believed in government ownership of armorplate factories, and of telephones and telegraphs. In 1921 he resumed the editorship of the *Raleigh News and*

*Observer*. He wrote *The Navy and the Nation* (1919); *Our Navy at War* (1922); and *Life of Woodrow Wilson* (1924).

**DANISH LITERATURE.** See SCANDINAVIAN LITERATURE.

**D'ANNUNZIO.** See ANNUNZIO; ITALIAN LITERATURE; ITALY, under *History*.

**DANUBE RIVER.** See WORLD WAR.

**DANZIG.** Formerly belonging to Germany, but since 1920 a Free City established by the Treaty of Versailles and placed under the League of Nations' protection. The area of the district is about 754 miles and the population, on Aug. 31, 1924, 384,000, largely German; in fact, only 6 per cent were Poles. The Free City area contains 318 localities, four of them cities with the following populations in 1927: Danzig proper, 230,000; Zoppot, 27,500; Neuteich, 2860; Tiegenhof, 3100. Of the Free City's total boundary line of 147 miles, 35 miles are on the sea. The production of the rural sections falls short of the requirements of the population with the result that foodstuffs have to be imported. The same is true of lumber, and stocks have to be imported from Poland. With Poland, Danzig is connected by three main lines, Danzig to Warsaw, 204 miles; Danzig to Lodz, 263 miles; Danzig to Posen, 192 miles. Inland waterways communication is maintained by the Vistula. Although by 1922 Danzig's trade had not reached pre-war proportions, it seemed in a fair way to recover its old stability. In 1913, 1921, and 1925 imports into Danzig by sea weighed, in metric tons, 1,233,630, 1,322,428, and 690,779; and exports by sea, 878,471, 383,448, and 2,031,969. A resumption of the importation of hides and skins, wool, wine, etc., all of which were destined for reshipment, appeared in 1922. Before the War, the principal exports from Danzig were grain, lumber, and sugar. Lumber has recovered pre-war proportions; sugar, too, was rapidly increasing, but grain had become an article of import. In 1926 the exports were as follows: Lumber, 1,391,000 tons (in 1927, 1,700,000 tons); grain, 272,000; sugar, 185,000; and coal, 3,405,000. Total goods imported in 1927 amounted to 1,517,194 tons and goods exported to 6,380,419 tons. In 1913, 2854 vessels of 918,097 net tons entered, and 2836 vessels of 931,509 net tons cleared, Danzig; in 1926, 5967 vessels of 3,432,480 net tons entered and 5963 vessels of 3,395,840 net tons cleared. The Free City of Danzig is not a port where no customs duties are levied but is included in the Polish Customs Union with duties levied according to the Polish tariff schedule. One basin only is set aside as a "free port" where goods may be imported without duty and stored, transhipped or reexported later. With modern facilities Danzig in 1928 ranked third among the Baltic ports.

**History.** The problem posed in 1919 by the Polish claim to a sea outlet involved several important considerations. Danzig, the focal point of Polish aspirations, was overwhelmingly German in population, at least 90 per cent. The creation of a Polish "corridor" through Prussia to connect Poland with Danzig on the sea meant the separation from the Reich of some 2,000,000 Germans in East Prussia. On the other hand, Danzig was bound up with the life of the new state economically and geographically, for Danzig was the port of the Vistula, and the valley of the Vistula was really Poland. But to preserve the principle of self-determination, of which so much had been made during the

War, and to check the growth of a German irredentism, a compromise had to be effected. Articles 100-108 of the Treaty of Versailles, therefore, set up in Danzig and the German area about it a Free City under the League of Nations. Its governing head was to be a High Commissioner; foreign relations and customs tariff were to be controlled by Poland; while economic matters such as administration of railways, posts, telegraph lines, waterways, and port facilities, were to be largely in Polish hands. Under Article 103 of the Versailles Treaty, which provided for the drafting of a constitution by representatives of the city in agreement with the High Commissioner appointed by the League, a Constituent Assembly was elected in Danzig on May 16, 1920, by universal suffrage with proportional representation. This Assembly, in which the various German parties had an overwhelming majority, drew up a constitution which was approved by the High Commissioner and the League. The formal proclamation of the new state, in accordance with these arrangements, occurred on Nov. 15, 1920. The essential points of the new system thus created were that the High Commissioner was to decide all points of dispute between Danzig and Poland, though a right of appeal to the League Council was assured; local autonomy was preserved through the creation of a bicameral diet, the president of whose upper house was to act as state head; a single customs area was to exist, and Poland was to be in charge of railway, postal, telegraph, telephone, diplomatic, and consular matters; Danzig port and terminal questions were to be in the hands of a joint board headed by a neutral. The High Commissioner in 1928 was Dr. von Hamel who assumed his duties in February, 1926. See POLAND, under *History*.

**DARDANELLES AND BOSPORUS STRAITS.** To the completed Treaty of Lausanne of July, 1923, was appended an elaborate convention for the regulation of the Dardanelles and Bosphorus Straits in peace and war. A commission was set up under the protection of the League of Nations, presided over by a Turk with powers to execute the prescribed regulations for the passage of ships. A demilitarized zone was mapped out, to include much smaller areas along the shores of the Dardanelles Strait and the Strait of Bosphorus. The Turks were permitted to maintain a garrison at Constantinople and the free movement of their fleet in Turkish waters was not to be impaired. In time of peace, the Straits were to be free for all merchant vessels and for warships; in time of war, Turkey, if a belligerent, was permitted to exclude enemy merchantmen and warships.

**DARLING, JAY NORWOOD** (J. N. DRNG) (1876- ). An American cartoonist. He was born at Norwood, Mich., and studied at Yankton College, S. D., and Beloit College, receiving his bachelor's degree at the latter institution. After serving as a reporter on Sioux City (Iowa) newspapers, he became cartoonist for the *Journal* (1901-06). Later he held a like position on the *Des Moines Register* (1906-11), the *New York Globe* (1911-13), the *Des Moines Register* again (1913-17), and the *New York Herald Tribune* and *Des Moines Register* after 1917. He also contributed cartoons to *Collier's Weekly* and the *Country Gentleman*. His syndicated cartoons reached an estimated total of 5,000,000 newspaper readers daily. His earlier

tendency to crowd the scenes of his cartoons with detail was modified as his technique matured. A striking characteristic was his ability to create the semblance of rapid motion, as shown in the whirlwind effects of which he made frequent use. His handling of difficult political situations was praised by many as wise and courageous.

**DARLING, SAMUEL TAYLOR** (1872- ). An American physician, parasitologist, and authority on tropical medicine, born in Harrison, N. J. He obtained his medical degree at the College of Physicians and Surgeons at Baltimore in 1903 and he was in charge of the laboratory of the Panama Canal during the construction period (1906-14), later accompanying General Gorgas to South Africa. He became a member of the staff of the Rockefeller Foundation in 1915 and was chairman of the expedition to the Far East for the purpose of studying hookworm and malaria; later, he visited Brazil in a similar capacity. He wrote many papers on tropical diseases and animal parasites and published, in collaboration: *Hookworm and Malaria Research in Malaya, Java, and the Fiji Islands* (Darling, Barber, and Hacker, 1917), and *Studies in Hookworm Infection in Brazil* (Darling and Smillie, 1921).

**DARLINGTON, JAMES HENRY** (1856- ). An American Protestant Episcopal bishop (see VOL. VI). He declined an appointment on the United States Commission to Russia, but became head of the Serbian Relief Fund in the United States. In 1920, he was chairman of the commission sent by the Protestant Episcopal Church to confer with the Eastern Orthodox Churches and the Old Catholics, which visited Constantinople, Athens, and other European capitals for the purpose of making a concordat. He is the author of *Verses by the Way* (3d series, 1927).

**DARLINGTON, URBAN VALENTINE W.** (1870- ). A bishop of the Methodist Episcopal Church, South, born in Shelby Co., Ky., and educated at the Kentucky Wesleyan College. In 1890, he was ordained and from that time until 1917 was pastor in various churches in Kentucky and West Virginia. In 1917-18, he was president of the Morris Harvey College in Barboursville, W. Va. He was made a bishop in 1918.

**DARMSTAEDTER, därm-stä'tër.** PAUL (1873- ). A German historian, born in Berlin. He studied at the universities of Berlin, Munich, Freiburg, and Strassburg, and became professor in Göttingen in 1907. His works include *Das Reichsgut in der Lombardei und in Piemont* (1896), *Die Befreiung der Leib eigenen in Savoyen, Schweiz und Lothringen* (1897), and a history of the United States for Ullstein's *History of the World*. A recent publication was *Geschichte der Aufteilung und Kolonisation Afrikas* (1913-20).

**DARRACH, WILLIAM** (1876- ). An American surgeon, dean of the College of Physicians and Surgeons, Columbia University. He was born at Germantown, Pa., was graduated at Yale (A.B.) in 1897, and received the degree of M.D. at Columbia in 1901, taking the First Harsen Prize. After 1903 he taught anatomy and surgery at Columbia, becoming professor of clinical surgery in 1916, and dean of the medical faculty in 1919. He was attending surgeon at the Presbyterian Hospital, the Vanderbilt Clinic, the Roosevelt Hospital, and Bellevue Hospital. As a colonel of the Medical Corps, U. S. Army,

he took part in the Château-Thierry, St. Mihiel, and Meuse-Argonne campaigns in the World War. Dr. Darrach contributed articles on surgery, anatomy, and medical education to professional journals and was associate editor of the *Archives of Surgery*.

**D'ARSONVAL, ARSÈNE.** See ARSONVAL, ARSÈNE, D'.

**DARTMOUTH COLLEGE.** A non-sectarian institution for men at Hanover, N. H., for which an English royal charter was granted in 1769. With the exception of the War years, 1917-19, when the number of students registered in the college fell off sharply, Dartmouth has grown steadily from 1914. Between that time and 1928, the enrollment increased from 1329 to 2244; the faculty was increased from 123 to 261; and the library from 130,000 to 240,000 volumes. Among the numerous buildings constructed on the campus were Topliff Hall and Russell Sage Hall, dormitories; the Steele Chemistry Building; Robinson Hall, headquarters of other than athletic student organizations; the Fisher Ames Baker Memorial Library, the gift of George F. Baker of New York, costing \$1,000,000; a new varsity field house, the gift of Howard Clark Davis; a laboratory for the natural sciences; new golf links at Hilton Field; the Spalding Swimming Pool; and a concrete football stand, a memorial to the Dartmouth men who died in the War. During 1928 there were also under construction the Carpenter Art Building, the Sanborn English House, and two dormitories. In 1922 a new selective process for admission was adopted under which due weight was given to scholarship, character, qualities of leadership, and apparent ability to profit by college education, and special treatment was also provided later for students of high grade. Ernest Martin Hopkins, Litt.D., LL.D., succeeded Ernest Fox Nichols as president in 1918.

**DARWINIAN THEORY.** See EVOLUTION; HEREDITY; ZOOLOGY.

**DASKAM, JOSEPHINE DODGE (MRS. SELDEN BACON)** (1876- ). An American author (see VOL. VI). Her recent works include: *To-Day's Daughter* (1914); *Open Market* (1915); *When Binks Came*; *The Memoirs of a Baby* (1920); *Blind Cupid* (1923), and new editions of many of her earlier publications. She is also the compiler of *On Our Hill* (1918); *Square Peggy* (1919); *Truth o' Women* (1923); *Medusa's Head* (1926); and *Counterpoint* (1927).

**DATO É IBADIER, dät'ò ä 'râ-dyâr.** ENRIQUE (1856-1921). A Spanish juriconsult and statesman (see VOL. VI). Upon the outbreak of the War, Dato was still in office and Spain's neutrality was a result of his efforts. He was Prime Minister during the crisis of 1917, and again in 1920-21. He was assassinated at Madrid on Mar. 8, 1921.

**DAUDET, dâ'dâ.** ERNEST (1837-1921). A French novelist and historian (see VOL. VI). His principal later works were *Les auteurs de la guerre de 1914*, Vol. I, *Bismarck*, Vol. II, *Guillaume II et François-Joseph* (1916); *Les complices des auteurs de la guerre* (1917); *La Mission du Comte de Saint-Vallier* (1918); *La Mission du Baron de Courcel* (1919); *Soixante années du règne des Romanoff* (1919); *L'avant-dernier Romanoff: Alexandre III* (1920); *Souvenirs de mon temps* (1st vol., 1921; others to be finished by his son).

**DAUDET, LÉON** (1867- ). A French novelist and editor, member of the Académie

Goncourt (see Vol. VI). His *Mémoires*, published from 1913 to 1922, were edited and translated by Arthur Kingsland Griggs (1925). His other later works include: *Hors du jong allemand* (1915); *Le Bonheur d'être riche* (1917); *Dans la lumière* (1919); *Le stupide XIXème siècle* (1921; tr. 1928); *Les Euxures devant les Hommes* (1922); *L'Hécatombe*, war memoirs (1923); *Moloch et Minerve* (1924); *Un jour d'orage*, a novel (1925); *La roman et les nouveaux écrivains* (1925); *L'agonie du régime*, 1919-25 (1925); *Le rêve éveillé* (1926); *Études et milieux littéraires* (1927); and *Courrier des pays-bas* (4 vols., 1928). During the World War, he was prominent in the campaign against defeatism and afterwards was conspicuous as head of the Action Française, the monarchist agitation. From 1919 until 1924, he was a member of the extreme right of the Chamber of Deputies. In 1927 his son was killed and Daudet implicated the police, which resulted in his arrest after a four-day siege in the office of *L'Action Française*. He caused an uproar by his escape from prison, and went first to Belgium and then to Holland.

**DAUGHERTY, HARRY MICAJAH** (1860- ). An American public official, born at Washington Court House, Ohio. He was educated in the public schools and studied law at the University of Michigan. He began practice at Washington Court House in 1881 and in 1893 removed to Columbus, Ohio, where he was in practice from 1902 to 1921. He was active in politics and was one of the leaders responsible for the nomination and election of President Harding, in whose cabinet he became Attorney General in 1921. Prior to that time, he had served in the Ohio House of Representatives for two terms. Following the death of President Harding in August, 1923, Mr. Daugherty was retained in office by President Coolidge. Throughout his term of service, he had been subject to severe criticism and this culminated in 1922 in an effort to bring impeachment proceedings in the House of Representatives. This failed on the ground that the evidence did not warrant the proceedings. In March, 1923, as a result of charges instigated chiefly by Senator Burton K. Wheeler of Montana, a committee of the Senate began an investigation into Mr. Daugherty's administration of his office. In spite of great pressure brought to bear upon him, President Coolidge refused to ask for Mr. Daugherty's resignation until the charges had been heard. Following Mr. Daugherty's refusal to furnish certain information to the committee, President Coolidge asked for and received his resignation on Mar. 28, 1924. In 1927 he was acquitted of conspiracy to defraud the Government.

**DAVENPORT, EUGENE** (1856- ). An American agriculturist (see Vol. VI). From 1895 to 1922, he was dean of the College of Agriculture at the University of Illinois, and in the latter year was made professor emeritus. Until 1922, he was director of the Agricultural Experiment Station and professor of thrematology at the University of Illinois. He wrote many agricultural bulletins for the experiment stations of Michigan and Illinois. He is also author of *Vacation on the Trail* (1923) and *The Farm* (1927).

**DAVENPORT, GEORGE WILLIAM** (1870- ). An American Protestant Episcopal bishop, born at Brandon, Vt. He studied at Ho-

bart College and was graduated from the General Theological Seminary in 1896, in which year he was also ordained. Subsequently, he was rector of various churches in the East, until he was consecrated bishop on Sept. 15, 1920. He has since resided at Easton, Md. While in Burlington, he served as provincial secretary of the first province.

**DAVID, KARL HEINRICH** (1884- ). A Swiss composer, born at St. Gall. He studied in Cologne and Munich, and then taught at the Basel Conservatory, 1910-14. The following three years he spent again in Germany, and then settled in Zurich, where, in 1927, he became editor of the *Schweizerische Musikzeitung*. He wrote *Das hohe Lied Salomonis* for soli, women's voices and orchestra; several female choruses with orchestra; a considerable quantity of chamber music; and the operas *Aschenputtel* (Basel, 1921), *Der Sizilianer* (Zurich, 1924), *Jugendfestspiel* (Zurich, 1924), and *Traumwandel* (Zurich, 1928).

**DAVIDSON, JO** (1883- ). An American sculptor born in New York City of Russian parents. He has won fame for his sculptures by the interpretation of the mental and physical in his subjects. His art is expressive of subdued emotion and characterized by massiveness of line. His original work won recognition in Paris, America, and London. He designed a heroic group for the French government to commemorate the first victory of the Marne and a statue of Senator Robert M. La Follette (q.v.) for the Capitol at Washington, D. C.

**DAVIDSON, THE MOST REV. AND RT. HON. RANDALL THOMAS, FIRST BARON OF LAMBETH** (1848- ). A former prelate of the Church of England (see Vol. VI), Archbishop of Canterbury from 1903 to 1928. Feeling himself too old to fill adequately so arduous a position, he resigned—an unprecedented action—at the age of 80, after 25 years as Primate of All England. His resignation, which took effect November 12, was signalized by the many honors bestowed upon him. He was given the freedom of the City of London and was made a baron so that he might still take part in the debates in the House of Lords. A gift of more than \$81,000 was raised by public subscription, \$10,000 of which came from his American admirers. As Primate, he was a strong force for the reconciliation of the factions within the church. He was decorated by Greece (1918), and Belgium and Serbia (1919). He wrote *The Testing of a Nation* (1919) and *Occasions* (1925).

**DAVIDSON COLLEGE.** An institution for the higher education of men at Davidson, N. C., founded in 1837. The student enrollment increased from 335 in 1914 to 625 in 1927-28, and in addition there was a summer school enrollment in 1928 of 90; the teaching staff increased from 15 to 45 in the autumn of 1928; the productive funds from \$284,745 to \$931,775, plus a 5 per cent equity in the Duke endowment; and the income increased from \$48,557 to \$311,102 in 1927-28, while the total plant valuation was placed at \$1,106,752 in 1928. The library contained 24,566 volumes in the latter year. During the period under review, three large fireproof dormitories, housing 340 students, were erected at a cost of \$225,000; and a central heating plant and homes for the professors were built; numerous courses were added to the curriculum; and entrance requirements were raised. President, W. J. Martin, M.D., Ph.D., LL.D.

**DAVIES, ARTHUR B.** (1862-1928). An American painter (see VOL. VI). In 1916 he was awarded the first W. A. Clark Prize and Corcoran gold medal. His manner continued highly individualistic, his rebellion against the existing order still softened by the romantic, mystic atmosphere with which he surrounded his subjects. In his later works, among them "Sea, Wind, and Sky," "Strewing Dust," "Orchard of Pleasant Bounties," and "Orestes," something of the mathematical or intellectual appeared to be displacing his earlier instinctive rhythm. By some, his feeling for abstract beauty was felt to be verging on preciosity. See *Arthur B. Davies: Essays on the Man and His Art*, by Duncan Phillips, Dwight Williams, Royal Cortissoz, Frank Jewett Mather, Jr., Edward W. Root, and Gustavus A. Eisen (1924).

**DAVIES, SIR (HENRY) WALFORD** (1869- ). A British organist and composer, born at Oswestry, England. He received his first musical education as a chorister in St. George's chapel, Windsor. From 1885 to 1890, he studied organ with Sir W. Parratt, acting frequently as his assistant. In 1890 he won a scholarship at the Royal College of Music, where for four years he studied composition, at the same time holding positions as organist. In 1895 he became professor of counterpoint at the Royal College of Music, remaining there till 1919, when he became professor of music at the University of Aberystwyth. He also was conductor of the London Church Choir Association (1901-13) and of the Bach Choir (1903-07). He was knighted in 1922. His works include an oratorio, *The Temple*; two symphonies; two overtures, *Dedication* and *Festal*; two suites for orchestra, *Parthenia* and *Wordsworth*; *Short Requiem*, *a cappella*; three piano quartets; two string quartets; three violin sonatas; a horn sonata; anthems, songs, and part-songs. He also published *Music and Christian Worship* (1913).

**DAVIES, SIR LOUIS HENRY** (1845-1924). A Canadian jurist (see VOL. VI). He remained a member of the Dominion House of Commons from 1882 to 1918, when he was appointed chief justice of the Supreme Court of Canada. In the same year, Chief Justice Davies became Deputy Governor General of Canada.

**DAVIES, WILLIAM HENRY** (1870- ). A Welsh poet and author, born at Newport, England. He began life as a picture-frame maker, but after completing his apprenticeship, he tramped through England and America, picking fruit, selling pins and needles, etc., and crossed the ocean several times on cattle boats. His published poems include *Collected Poems: Second Series* (1923), *Secrets* (1924), *A Poet's Alphabet* (1925); *The Song of Love* (1926); *A Poet's Calendar* (1927), and *Collected Poems* (1929). His prose works are *The Autobiography of a Super-Tramp* (1908), *Beggars* (1909), *A Weak Woman* (1911), *The True Traveler* (1912), *A Poet's Pilgrimage* (1918), *Later Days* (1925); *The Adventures of Johnny Walker, Tramp* (1926), and *Dancing Mad* (1927).

**DAVIS, BERGEN** (1869- ). An American physicist. He was born at White House, N. J., graduated at Rutgers College (B.S., 1896), received the Ph.D. degree at Columbia, and studied at Göttingen and Cambridge. He became instructor in physics at Columbia in 1903 and professor in 1918. Having contributed papers on sound ionization by collision, radiation by

electron impact, X-ray emission, etc., he was elected to the National Academy of Sciences in 1929.

**DAVIS, CHARLES HAROLD** (1856- ). An American painter (see VOL. VI). The change from his earlier tendency to interpret nature in her more sombre moods is to be seen in such later paintings as "The Sunny Hillside," "In Golden Light," and "On the West Wind," where hill and tree, as well as cloud, are used expressively and a spirit of light and joy predominates.

**DAVIS, DWIGHT FILLEY** (1879- ). An American public official and Governor General of the Philippines. He was born at St. Louis, Mo. After graduation at Harvard, he studied law at Washington University (LL.B., 1903) and at once became actively interested in the community life of his native city, serving on various municipal commissions and in city offices. In the World War, he was successively captain, major, and lieutenant colonel and was awarded the D.S.C. "for extraordinary heroism" in operations at Baulny and Chaudron Farm, France, on Sept. 29-30, 1917. He was appointed Director of the War Finance Corporation, 1921-23, Assistant Secretary of War, 1923-25, and Secretary of War, 1925-29. President Hoover named him as Governor General of the Philippines in May, 1929. In his inaugural address of July 8, 1929, he pledged his administration to friendly coöperation with the Filipino people, and the suppression of dishonesty in government.

**DAVIS, HARVEY NATHANIEL** (1881- ). An American physicist, born at Providence, R. I. He was graduated in 1901 at Brown University and received his Ph.D. at Harvard in 1906. He was instructor of physics at Harvard in 1905-10, and, after successive promotions, he became professor of mechanical engineering, 1919-27. Since 1928 he has been president of the Stevens Institute of Technology. He also served with the General Electric Company during 1917-18, in charge of their turbine department; and in 1921 became consulting engineer to the United States Bureau of Mines. During the World War, he was associated with the Air Service of the United States Army as a mechanical engineer. His various original investigations have had to do with the thermal properties of matter. He is the author (with L. S. Marks) of *Steam Tables and Diagrams* (1908) and (with N. H. Black) of *Practical Physics for High Schools* (1913).

**DAVIS, HENRY WILLIAM CARLESS** (1874-1928). An English historian (see VOL. VI). In 1915 he was a member of the War Trade Intelligence Department, and the following year of the War Trade Advisory Committee. He was made Commander in the Order of the British Empire in 1918 and became director of the *Dictionary of National Biography* (1920), and was professor of modern history in the University of Manchester (1921-25). In 1924 he was Fords Lecturer at Oxford University. From 1925 until his death, he was Regius Professor of modern history at Oxford, and in 1926 he was made curator of the Bodleian Library. His works include: *Political Thought of Treitschke* (1914); *Why We Are at War* (in collaboration, 1914); contributions to the *History of the Peace Conference* (ed. Temperley, 1920, etc.); "England, 1815-46," in *Story of the British Nation* (1923); and *Medieval England* (1924). He edited *Oxford Pamphlets* (1914-15).



**DAVIS, JAMES COX** (1867- ). An American lawyer, born at Keokuk, Iowa. After passing through the public schools at Keokuk and London, Ont., he was admitted to the bar in 1877 and began practice in Keokuk, where he remained until 1903. He acted as city solicitor of Keokuk, and as mayor. Under the Federal administration of railways, he was general solicitor for the Chicago and Northwestern, and in 1920-21 he was general counsel of the United States Railroad Administration. In the latter year, he was appointed director general and agent of the President in settling controversies arising out of Federal control. He resigned that post in 1926 and resumed private practice at Des Moines, Iowa.

**DAVIS, JAMES JOHN** (1873- ). An American cabinet member, born at Tredegar, South Wales, where he attended the public schools. He came to the United States in 1881 and later worked in iron and steel mills in Pittsburgh and in Elwood, Ind. From 1898 on, he was active in city and State politics in Indiana and in various fraternal organizations. He was a founder of the Mooseheart (Ill.) Home and School. He was named Secretary of Labor in 1921 by President Harding and continued under Presidents Coolidge and Hoover.

**DAVIS, JOHN WILLIAM** (1873- ). An American lawyer and diplomatist, born at Clarksburg, W. Va., and educated at Washington and Lee University. He was admitted to the bar in 1895, and from 1896 to 1897 was assistant professor of law in Washington and Lee University. During the period 1897-1913, he practiced law at Clarksburg, took an active interest in State and national politics, and was elected to Congress. From 1913 to 1918, he was Solicitor General of the United States, and from the latter year until 1921, he was Ambassador to Great Britain. In 1924 he was Democratic nominee for the Presidency. In 1921 he resumed the practice of law in New York City. He is president of the English-Speaking Union for the United States. See UNITED STATES, under *History*.

**DAVIS, KATHERINE BEMENT** (1860- ). An American sociologist (see VOL. VI). She was appointed, by Mayor Mitchel, Commissioner of Correction of New York City, for the term Jan. 1, 1914, to Dec. 28, 1915. From 1915 to 1917, she was chairman of the Parole Commission. In 1918 she was director of the women's work section of the Social Hygiene Division of the Commission on Training Camp Activities, and in the same year, was appointed general secretary of the Bureau of Social Hygiene. She directed a study of the housing conditions of employed women in the Borough of Manhattan, New York City, the results of which were published in 1922.

**DAVIS, NORMAN H.** (1878- ). An American statesman, born in Bedford Co., Tenn., and educated at Vanderbilt University and the University of California. In 1902 he interested himself in the sugar, banking, and other businesses in Cuba. During the World War, he was active on various commissions and boards and as special delegate to foreign countries, particularly as regards financial problems. He was financial adviser to the American Peace Delegates in Paris and a member of the Armistice Commission and of the Supreme Economic Council. In 1919-20 he was Assistant Secretary of the Treasury, and from 1920 to 1921, he

was alternately Under Secretary of State and Acting Secretary of State. In May, 1927, he served as a member of the American delegation to the International Economic Conference at Geneva.

**DAVIS, OWEN** (1874- ). An American dramatist born in Portland, Me., who began writing plays in 1898 and has written more than 100 plays produced in New York. Of these, about 50, mostly melodramas, were produced by A. H. Woods. His most recent popular plays were: *The Family Cupboard*; *Sinners*; *Mile a Minute*; *Forever After*; *Opportunity*; *The Detour* (1921); *Icebound* (1922), which was awarded the Pulitzer Prize for the year; *The Nervous Wreck* (1923); *Lazybones* (1924); *Easy Come, Easy Go* (1925); *Beware of Widows* (1925).

**DAVISON, FREDERICK** TRUBEE (1896- ). An American Assistant Secretary of War, who was born in New York City, graduated at Yale, and who studied law at Columbia (LL.B., 1922). In the World War, he served in the Naval Air Service. He was admitted to the bar in 1922 and began practice in New York City. He represented Nassau County in the State Assembly in 1922-26. In 1926 President Coolidge appointed him Assistant Secretary of War and President Hoover, three years later, reappointed him to the same office. He has had special oversight of the development of the army aviation service. He was a trustee of the Guggenheim Fund for the Promotion of Aviation, and a member of the executive committee of the National Crime Commission.

**DAVISON, HENRY POMEROY** (1867-1922). An American banker born at Troy, Pa. After attending school at Greylock Institute, South Williamstown, Mass., he was errand boy in a bank conducted by his uncle at Troy, Pa. He later went to the Astor Place Bank, New York City, remaining there from 1891 to 1894. He became vice president of the First National Bank in 1902 and afterwards a member of the firm of J. P. Morgan & Co. He was chairman of the executive commission and a director of the Bankers' Trust Company; director of the American Foreign Securities Company; and from 1917 to 1919, he was chairman of the War Council of the American Red Cross, during the time when \$300,000,000 was raised by popular subscription for war sufferers. He was elected chairman of the governing board of the World League of Red Cross Societies in Paris, May, 1919.

**DAVISSON, CLINTON JOSEPH** (1881- ). An American physicist. He was born at Bloomington, Ill., and graduated (B.S.) at the University of Chicago in 1908. He obtained the Ph.D. degree at Princeton in 1911. For six years, he was instructor in physics at the Carnegie Institute of Technology, Pittsburgh, and since 1917 has been a member of the technical staff of the Bell Telephone Laboratories in New York City. In 1928 he was awarded the Comstock Prize (\$2300) for the discovery of electron diffraction. In the following year, he was elected to the National Academy of Sciences. He is the author of many papers on radiation, thermionics, and electron physics.

**DAWES, CHARLES GATES** (1865- ). An American public official (see VOL. VI). In 1917 he was in France on General Pershing's administrative staff. He was chairman of the general purchasing board and also general purchasing agent for the United States Army in

France. In 1919 he returned to the United States, and in 1921 was appointed by the President as director of the newly created Bureau of the Budget, and organized the first budget of the United States government. On July 8, 1922, he retired from the Budget Bureau, and in November of the same year was elected director of the Chicago & Great Western Railway Company. In 1923 General Dawes was appointed chairman of an international group of experts to ascertain Germany's capacity to pay war reparations which formulated the Dawes Plan, put into operation Sept. 1, 1924. (see REPARATIONS). Nominated for Vice President of the United States by the Republican Party in June, 1924, he was elected in November. In his inaugural address, he vigorously attacked the rules of the Senate permitting unlimited debate and advocated their modification throughout his term of office, but without success. In 1925 he was awarded the Nobel Peace Prize jointly with Sir Austen Chamberlain, British Foreign Secretary. He turned over his share of the prize to the endowment fund of the Walter Hines Page School of International Relations at Johns Hopkins. At the expiration of his term as Vice President in March, 1929, he headed a commission of American financial experts who reorganized the finances of the Dominican Republic. While engaged in this task, he was appointed Ambassador to Great Britain to succeed Alanson B. Houghton. Immediately after assuming his duties as Ambassador in June, 1929, he outlined President Hoover's proposals for limitation of naval armaments to Prime Minister Ramsay MacDonald in Scotland (Sunday, June 16), and on June 18, speaking before The Pilgrims in London, he indicated the procedure which the United States Government would follow in its attempt to secure world naval limitation. Through the Summer he was in active conference with the Prime Minister on this subject. He received an honorary D.C.L. degree from Oxford, 1929. He wrote *A Journal of the Great War* (1921) and *The First Year of the Budget of the United States* (1923).

**DAWES REPORT.** See REPARATIONS.

**DAWSON, ALEC JOHN** (1872- ). An English novelist (see VOL. VI). He served throughout the World War (1914-19), was awarded the Croix de Guerre with Palm, and decorated with the Order of the British Empire. In 1919-21, he was director of information to the Government of Bombay. He is author of *How to Help Lord Kitchener* (1914); *Somme Battle Stories* (1916); *Back to Blighty* (1917); *For France* (1917); *Everybody's Dog Book* (1922); *Britain's Life Boats* (1923); *Peter of Monks-leaze: His Mortal Tenement* (1924); *The Emergency of Marie* (1926); and *Letters to Young Dog Owners* (1927).

**DAWSON, CONINGSBY (WILLIAM)** (1883- ). An Anglo-American author (see VOL. VI). He joined the Canadian Army at the front in 1916 and continued in service until the end of the World War. After having been wounded, he came twice to the United States (1917, 1918) on lecture tours. In 1918 he investigated, for the British Ministry of Information, American military preparedness in France. In 1919 he went to England to study European reconstruction problems, and subsequently lectured on the subject of the United States. He also visited and reported on the devastated regions of central and eastern Eu-

rope at the request of Herbert Hoover. His recent works include: *Florence on a Certain Night* (1914); *The Raft* (1914); *Slaves of Freedom* (1916); *The Seventh Christmas* (1917, 1921); *Carry On* (1917); *The Glory of the Trenches* (1918); *Out To Win* (1918); *Living Bayonets* (1919); *The Test of Scarlet* (1919); *The Little House* (1920); *It Might Have Happened to You* (1921); *The Kingdom Round the Corner* (1921, 1923); *Christmas Outside Eden* (1922); *The Coast of Folly* (1924); *Old Youth* (1925). He also edited, with W. J. Dawson (q.v.), *Best Short Stories* (1923).

**DAWSON, MILES MENANDER** (1863- ). An American lawyer (see VOL. VI). He was adviser to the Governor of New York and the commission regarding workmen's compensation in 1914. He was special counsel for the United States in the tax litigation in 1915 and 1917. In 1917 and 1921 he was adviser to the War Risk Bureau, and in 1918-19, special attorney examiner for the United States Shipping Board Emergency Fleet Corporation. In the latter year, he was also counsel and actuary for the commission to investigate the New York State Insurance Fund. He is the author of *The Ethics of Confucius* (1915) and *Ethics of Socrates* (1924) and the translator of *Brand*, a poetical tragedy, by Henrik Ibsen (1916).

**DAWSON, THE REV. WILLIAM JAMES** (1854-1928). An English clergyman and author (see VOL. VI), who settled in the United States and was a Presbyterian pastor in Newark, N. J. He was the author of: *Robert Shenstone* (novel, 1917); *The Father of a Soldier* (1917); *The War Eagle* (1918); *Chalmers Comes Back* (1919); *The Borrowdale Tragedy* (1920); and *The Autobiography of a Mind* (1925). He edited, with Coningsby Dawson (q.v.), *Best Short Stories* (1923).

**DAWSON OF PENN, BERTRAND, FIRST BARON** (186- ). A British medical authority, Physician-in-Ordinary to King George V since 1907 and to the Prince of Wales since 1923. Receiving his medical training at University College and London Hospital, he became physician to the hospital and physician-extraordinary to King Edward VII. He was created baron in 1920, a Knight Commander of the Bath in 1926, and a Privy Councillor in 1929, following King George's recovery from his severe illness of the winter of 1928-29. He holds honorary degrees from leading British and American universities. His long list of medical works includes *The Diagnosis and Operative Treatment of Diseases of the Stomach* (1908); *The Microbic Factor in Gastro-Intestinal Disease* (1911); and *Paratyphoid Fever* (1916).

**DAY, CLIVE** (1871- ). An American university professor (see VOL. VI). He was chief of the Balkan Division of the American Commission to Negotiate Peace (Paris, 1918-19). He published a revised and enlarged edition of his *History of Commerce* (1922); *The Question of the Balkans*, a brochure (1920); and *History of Commerce of the United States* (1925).

**DAY, FRANK PARKER** (1881- ). An American college president. He was born at Shubenacadie, Nova Scotia, and graduated at Mount Allison University, Sackville, N. B. (1903). He later studied at Oxford (Rhodes Scholar) and the University of Berlin (1905-09), and was a lecturer at the University of Bristol, Eng. (1908-09). Returning to America, he held professorships of English at the Uni-

versity of New Brunswick (1909-12) and the Carnegie Institute of Technology at Pittsburgh (1912-14). In the World War, he recruited and commanded the 185th Cape Breton Highlanders, served in France with the 16th Royal Scots, and commanded the 25th Canadian Infantry Battalion. After the Armistice, he returned to the Carnegie Institute of Technology as dean (1919-27). He was professor of English at Swarthmore College (1927-29) and was installed as president of Union College, Schenectady, N. Y., in 1929. He is the author of *River of Strangers*; *The Autobiography of a Fisherman*; and *Rock-bound*; besides short stories contributed to magazines.

**DAY, HOLMAN FRANCIS** (1865- ). An American author (see VOL. VI). Among his later works are *The Landloper* (1915); *Along Came Ruth* (play produced in New York, 1914); *Blow the Man Down* (1916); *Where Your Treasure Is* (1917); *Kavanagh's Clare* (1917); *The Rider of the King Log* (1919); *When Egypt Went Broke* (1920); *All Wool Morrison* (1921); *Joan of Arc of the North Woods* (1922); *The Loving Are the Daring* (1923); *Clothes Make the Pirate* (1925); *John Lang* (1926); *Star-wagons* (1928).

**DAY, JAMES ROSCOE** (1845-1923). An American educator (see VOL. VI). In 1922 he became chancellor emeritus of Syracuse University. He was famous as a defender of "big business." During and after the World War, he criticized the Wilson administration and the League of Nations unsparingly. He published *My Neighbor the Workingman*, and at the time of his death was about to start on an autobiography.

**DAYTON.** A city of Ohio. The population increased from 116,577 in 1910 to 152,559 in 1920, and to 184,500 in 1928 by estimate of the Bureau of the Census. The population of Greater Dayton is estimated at 220,000. The corporate limits of Dayton cover an area of 17 square miles, while the suburbs which surround the city extend this area to 40 square miles. Dayton operates under the city manager form of government, being the first large city in the United States to adopt this plan (1914). The Miami Valley, which gives to Dayton much of its scenic beauty, also brought to it the devastating flood in 1913. The Miami River overflowed its banks, inundating the downtown section, but Dayton citizens turned this calamity into an opportunity to reestablish and rebuild the city on a bigger scale and also build a series of dams which would prevent the occurrence of another flood. These dams, when completed in 1923, cost \$32,000,000 and are considered one of the world's greatest engineering projects.

Dayton is known internationally as the home of aviation. Here the first heavier-than-air flying machine was invented and the city has remained an important aviation centre. It presented to the United States Government 5000 acres of land which is now the permanent home of governmental research and engineering laboratories. The aviation field is named in honor of Wilbur and Orville Wright.

Dayton is essentially an industrial city, its industries manufacturing more than 1000 different articles. The 50,000 employees in 510 manufacturing establishments are paid \$63,500,000 a year. The value of goods manufactured and sold each year is placed at \$327,000,000. There are eight banking institutions and 18

building and loan associations, the assets of which exceed \$125,000,000. The building and loan system is said to be the largest in the United States, both in the number of institutions and amount of assets. The assessed valuation of real property in Dayton, in 1928, was \$347,277,780, the tax rate being \$25 per \$1000; and the net debt was \$19,443,126.

Dayton is also an educational centre. It has 32 public schools, 17 parochial schools, two seminaries and one university. Bonebrake Seminary is conducted by the United Brethren Church, and students of this denomination from every part of the country receive their theological education here. Central Theological Seminary is maintained by the Reformed Church. It is a denominational college preparing students for the ministry. The University of Dayton, a Roman Catholic institution, has an annual enrollment of 1200 students. The buildings and grounds are valued at \$2,350,000. Its courses are open to persons of any religious faith who desire education in commerce and law, engineering, arts and letters, and natural science.

**DEALEY, JAMES QUAYLE** (1861- ). An American university professor (see VOL. VI). He was president of the American Sociological Association in 1920, and in 1921 went to China as exchange professor and lecturer. In 1928 he became professor emeritus at Brown University and joined the staff of the Dallas, Tex., *News*. He wrote *The Growth of State Constitutions* (1915); *Sociology—Its Development and Applications* (1920); *State and Government* (1921); *Foreign Policies of the United States* (1927); and *Political Situations in Rhode Island* (1928).

**DEAN, ARTHUR LYMAN** (1878- ). An American chemist and university president, born at Southwick, Mass. He was graduated at Harvard in 1900 and received his Ph.D. from Yale in 1902. During 1902-07, he taught plant physiology at Sheffield Scientific School, Yale, and was also a Carnegie research assistant during 1904-05, as well as chief of the section of wood chemistry in the United States Forest Service during 1905-07. He had charge of the chemical laboratory of A. D. Little in Boston during 1907-08, but at the close of the year returned to the Sheffield Scientific School, being assistant professor until 1914. That year he was called to the presidency of the University of Hawaii in Honolulu, where he remained until 1927. His original investigations have included studies on inulin, proteolytic enzymes, creosote oils, and chaulmoogra oil in treatment of leprosy, on all of which he has published valuable papers.

**DEAN, BASFORD** (1867-1928). An American zoölogist and expert in armor (see VOL. VI). Dr. Dean's active professorship of vertebrate zoölogy at Columbia terminated in 1927. In 1926 he retired as curator of ichthyology at the American Museum of Natural History, but retained an honorary curatorship. From 1903 until his death, he was curator of arms and armor at the Metropolitan Museum of Art, New York City. He also was adviser on armor to the U. S. War Department. In addition to many works on fishes (including a bibliography of 50,000 titles), he was the author of several publications on arms and armor.

**DEARBORN, GEORGE VAN NESS** (1869- ). An American psychologist and surgeon, born at Nashua, N. H. He was educated at Dartmouth College and the College of Physicians

and Surgeons, Columbia University (M.D., 1893). After graduate study in psychology at Harvard and Columbia (Ph.D., 1899), he became a professor of psychology and education at the Sargent Normal School, Cambridge, Mass. (1906-21) and professor of physiology at Tufts College (1900-16). During and since the World War, he has been attached to the U. S. Public Health Service, neuropsychiatric division. Besides various contributions to professional journals, he wrote *The Emotion of Joy* (1899); *Textbook of Human Physiology* (1908); *Motor-Sensory Development* (1910); *Physiology and Hygiene* (1921); and other works on psychology and hygiene.

**DEARBORN, WALTER FENNO** (1878- ). An American psychologist and educator born at Marblehead, Mass. He was educated at Wesleyan and Columbia universities, receiving his degree of Ph.D. from the latter institution in 1905. He pursued medical studies in Germany at the University of Munich, taught educational psychology at the University of Wisconsin, and in 1909-12 was associate professor of education at the University of Chicago. He was assistant professor, 1912-17, and professor since 1917 at Harvard. One of the leading authorities in educational psychology, Professor Dearborn has contributed numerous papers on the psychology of reading, the practice experiment in learning, intelligence tests, mental hygiene, and school training. He is the author of *Dearborn Group Tests of Intelligence* (1920).

**DEATH.** See ZOOLOGY.

**DEAVER, JOHN BLAIR** (1855- ). An American surgeon, who received his medical degree from the University of Pennsylvania in 1878, and was appointed Barton professor of surgery there and chief surgeon to the University Hospital. He became professor emeritus in 1923. His major publications include: *Treatise on Appendicitis* (1896), which was expanded in its fourth edition (1913); *Surgical Anatomy*, 3 vols. (1889-93); *Enlargement of the Prostate* (1905); *Surgery of the Upper Abdomen*, in collaboration with Ashhurst, 2 vols. (1909, 1913); *Surgical Anatomy of the Head and Neck* (1912); *The Breast*, in collaboration with McFarland (1917); *Excursions into Surgical Subjects*, with Reimann (1923). In 1926-7 appeared a new edition of his anatomical work with the title *Surgical Anatomy of the Human Body*, 3 vols.

**DE BLOIS, AUSTEN KENNEDY** (1866- ). An American clergyman, born at Wolfville, N. S., educated at Brown University, and in Berlin and Leipzig, Germany. He became president of Shurtleff College, Alton, Ill., in 1894. During 1900-01, he traveled in Europe and Africa, and on returning to the United States became pastor of several Baptist churches successively including the First Baptist Church of Boston, 1911-26. He edited the *Watchman-Examiner*, New York, 1926-28, and was president of the Eastern Theological Seminary, 1926-. He wrote: *Bible Study in American Colleges* (1899); *The Pioneer School* (1900); *Imperialism and Democracy* (1901); *History of the First Baptist Church in Boston, 1665-1915* (1916); *Life of John Mason Peck, Prophet of the Prairies* (1917); *The Message of Wisdom: Studies in the Book of Proverbs* (1920).

**DEBS, EUGENE VICTOR** (1855-1926). An American Socialist leader and labor organizer (see VOL. VI). He was convicted of violation of the espionage act in September, 1918, and was

sentenced to 10 years' imprisonment. The decision was sustained by the Supreme Court of the United States on Mar. 10, 1919, and he went to prison on Apr. 13, 1919. He was pardoned by President Harding on Dec. 24, 1921, but his political rights were not restored. In 1925 he campaigned in New York City for the Socialist Mayoralty candidate. His health was broken by his labors on behalf of political prisoners. He died in a sanitarium at Elmhurst, Ill.

**DEBT, PUBLIC.** See FINANCE AND BANKING.

**DEEPING, (GEORGE) WARWICK** (1877- ). A British author born in Southend, Essex, and educated at Merchant Taylors' School and Trinity College, Cambridge. He became a doctor, but after practicing a year, turned to literature. In 1915 he joined the Royal Army Medical Corps and served in Gallipoli, Egypt, and France. The appealing and human qualities of his characters made his novels popular. They include *Uther and Igraine*; *A Woman's War* (1907); *The Rust of Rome*; *The Return of the Petticoat*; *Unrest* (1916); *Martin Valliant* (1917); *Second Youth* (1919); *The House of Adventure* (1921); *The Secret Sanctuary* (1923); *Suva John* (1924); *Sorrell and Son*, the novel that made his reputation (1925); *Doomsday* (1927); *Kitty* (1928); *Old Pybus* (1928); and *Ropers Row* (1929).

**DEFLATION.** See AGRICULTURE; FINANCE AND BANKING.

**DE FOREST, LEE** (1873- ). An American inventor (see VOL. VI). In 1915 he was awarded a gold medal by the San Francisco Exposition for his work in developing the radio telephone. In 1919 he had taken out over 120 patents on radio devices, the most important being the "Audion," a detector, oscillator, and amplifier which made possible telephone service both by wire and wireless across the continent. Several of his most important patents were sustained by the courts.

**DE HAVEN, FRANK** (1856- ). An American painter, born at Bluffton, Ind. He was a pupil of George H. Smilie. Having specialized in landscapes, he won the Innes and Shaw prizes of the Salmagundi Club (New York) in 1900 and 1901, silver medals at the Charleston and St. Louis Expositions, and the Vezin Prize (1916), and the Plimpton Prize (1925) of the Salmagundi Club. In 1920 he was elected a member of the National Academy of Design.

**DEISSMANN, dis'män, GUSTAV ADOLF** (1856- ). A German New Testament scholar, professor at the University of Berlin, *Gehemkon-sistorialrat* (1916- ), member of the Brandenburg Provincial Synod and of the Prussian General Synod from 1914 on (see VOL. VI). He delivered a course of lectures for the clergymen in 1916-17 in Warsaw, Vilna, and Brussels. In 1918 he was for the second time Olaus-Petri Lecturer at the University of Upsala, and the following year became a member of the German Evangelical Synod in Dresden. His works published since 1913 include: *Der Lehrstoff für Religionsgeschichte* (1914); *Der Krieg und die Religion* (1914); *Deutscher Schwertschlag* (1915, 28th ed., 1916); *Inneses Aufgebot* (1st to 3d ed., 1915); *Evangelischer Wochenbrief* (1914-21); *The Religion of Jesus and the Faith of Paul* (English ed., 1923); *De Profundis* (1925), and *Die Regierungswissenschaft in Selbstdarstellungen* (1925).

**DELACHENAL, de-lä-shä-näl, JEAN PIERRE FRANÇOIS ROLAND** (1854-1923). A French his-

torian who was born at Lyons, and in 1879 entered the French Palaeographic Institute, the École des Cartes. In 1885 he published the learned *Histoire des Arocauts du Parlement de Paris*. His monumental work on Charles V. occupied 25 years of labor; three volumes were published from 1897 to 1916, and at his death two additional volumes remained unpublished. Delachenal was also the author of the *Grandes Chroniques de France* (1910-1916-1920).

**DELAGOA BAY.** See PORTUGUESE EAST AFRICA.

**DE LA GORCE.** See LA GORCE.

**DE LA MARE, WALTER** (1873- ). An English author, born at Charlton, Kent, and educated at St. Paul's Cathedral School, where he founded the *Chorister's Journal* (1889), which is still in existence. He left school at Easter in 1890, and worked for the Anglo-American Oil Company until 1908, when a small government grant and pension of £100 a year allowed him to devote all of his time to writing. At first he wrote for magazines under the name of Walter Ramal. There are three distinct sides to his work—his poetry, his juvenile and light prose, and his strangely abnormal and decadent prose such as *The Return* (1910), *The Memoirs of a Midget* (1921), *The Riddle and Other Stories* (1923), and *The Connoisseur and Other Stories* (1926). His other prose works were *Henry Broken*, recounting his travels among the characters of literature (1904); *The Three Mulla-Mulgars*, the story of three monkeys (1910); *Crossings*, a fairy play (1921); *Ding Dong Bell* (1924); and *Broomsticks and Other Stories* for the young (1925). His poetical works include *Songs of Childhood* (1902); *The Listeners and Other Poems* (1912); *Peacock Pie* (1913); *Motley and Other Poems* (1919); *Collected Poems, 1902-1918* (1920); *Stuff and Nonsense, and So On* (1927); and *Selected Poems* (1927). His anthology *Come Hither* (1923) was very popular. Consult *Walter de la Mare: A Biographical and Critical Study*, by R. L. Mégroz (1924), *Figures in Modern Literature*, by John Boynton Priestly (1924), and Forrest Reid, *Walter de la Mare* (1929).

**DELAMARTER, ERIC** (1880- ). An American organist and composer, born in Lansing, Mich. After studying the organ with G. H. Fairclough in St. Paul and W. Middelschulte in Chicago, he went for further study to Guillemant in Paris (1900-02). During 1900-02 he was organist at the New England Congregational Church in Chicago, then at the First Church of Christ Scientist, and since 1914 at the Fourth Presbyterian Church. From 1911 to 1913, he was conductor of the Musical Art Society. In 1918 he was appointed assistant conductor of the Chicago Symphony Orchestra and in 1924 he organized the Solo Orchestra (25 performers), whose object is the performance of modern works written for unusual combinations of instruments. He was music critic for the *Chicago Record-Herald* (1908-09), *Tribune* (1909-10), and after 1910 for the *Inter-Ocean*. He has written two symphonies (G and G minor); two overtures, *Old New England* and *The Betrothal*; *Serenade* and three suites for orchestra; two concertos for organ and orchestra; and some chamber music.

**DELAND, MARGARETTA WADE** (1857- ). An American author (see VOL. VI). She is the author of: *The Hands of Esau* (1914); *Around Old Chester* (1915); *The Rising Tide* (1916,

1918); *Old Chester Tales* (1919, Introduction by Vida D. Scudder); *Promises of Alice* (1919); *Small Things* (1919); *Old Chester Secret* (1920); *The Vehement Flame* (1922); *New Friends in Old Chester* (1924); and *The Keys* (1926).

**DELANO, EDITH BARNARD** (?- ). An American author, born at Washington. She wrote: *Zebedee V* (1912); *The Land of Content* (1913); *The Colonel's Experiment* (1913); *Rags* (1915); *The White Pearl* (1918); *June* (1916); *To-morrow Morning* (1917); *Two Alice* (1918); and *The Way of All Earth* (1925). She also wrote feature photoplays and contributed to many magazines.

**DELANO, FREDERIC ADRIAN** (1863 ). An American railroad president born in Hongkong, China (see VOL. VI). He was appointed by President Wilson to the Federal Reserve Board in 1914, but resigned in June, 1918, to join the Army. He was commissioned major of the Engineering Corps and assigned to the staff of General Atterbury, director general of transportation at Tours, France. He was promoted to be colonel of the transportation corps in May, 1919, and discharged on Oct. 25, 1919. He was appointed receiver for the Supreme Court of the United States in the Red River Boundary Case, and was chairman of the international commission of the League of Nations to inquire into the production of opium in Persia.

**DELANO, LYMAN** (1883- ). An American railway official, born in Newburg, N. Y. He graduated from Harvard in 1906, and began his railway career in 1900 with the Atlantic Coast Line R. R., eventually becoming the executive vice president. He was an official and director in many other railroads and terminal companies. During the period of the World War, he was Federal manager for the A. C. L. and other railroads.

**DELANO, WILLIAM ADAMS** (1874- ). An American architect, born in New York City and educated at Yale University and at the École des Beaux Arts in Paris. He began practice in New York in 1903, and from that time until 1910 was professor of design in Columbia University. He collaborated on the plans for the Knickerbocker, Colony, and India House club buildings in New York.

**DELAWARE.** The forty-seventh State of the United States in size (2370 square miles) and the forty-sixth in population; capital, Dover. The total population increased from 202,322 in 1910 to 223,003 in 1920, a gain of 10.2 per cent; estimated population, 1928, 244,000. The white population rose from 171,102 (1910) to 192,615 (1920); the number of Negroes fell from 31,181 to 30,335; that of native whites increased from 153,682 to 172,805; foreign-born whites, from 17,420 to 19,810. The urban population grew from 97,085 to 120,767; the rural decreased from 105,237 to 102,236. The only large city is Wilmington (q.v.), with a population of 110,168 in 1920 and 87,411 in 1910.

**Agriculture.** While the estimated population of the State showed an increase up to 1928, the number of farms which had decreased from 10,836 (1910) to 10,140 (1920), made but a scant gain to 10,257 for 1925; acreage, 944,511 in 1920, fell to 899,641 in 1925. The total value of farm property showed a slight decrease from \$80,137,614 (1920) to \$72,708,416 (1925); and the average value per farm from \$7903 to \$7097. The percentage of tenancy



in 1925 was 35.8, as against 39.3 in 1920. Of the total 10,257 farms in 1925, 6515 were worked by owners, compared with 6010 in 1920; 74, by managers, compared with 144; 3668, by tenants, compared with 3986. The white farmers in 1920 numbered 9268, and increased to 9426 in 1925; Negro farmers, 827 in 1920, numbered 831 in 1925. The total number of dairy cows in 1920 was 37,878; in 1925, 33,793. The number of sheep decreased from 3220 to 1749. The estimated production of the chief farm crops in 1928 was: Corn, 4,448,000 bushels; wheat, 1,836,000; potatoes, 658,000; sweet potatoes, 980,000 bushels; and hay, 141,000 tons. Comparative figures for 1913 are corn, 6,206,000 bushels; wheat, 1,638,000; potatoes, 957,000 bushels; and hay, 94,000 tons. In 1927 the apple and peach crops were estimated at 1,150,000 and 287,000 bushels, respectively.

**Manufactures.** Delaware is not an important industrial State. The only city of more than 10,000 inhabitants is Wilmington, and the industries of the State are to a large extent concentrated there. This city had 61 per cent of the value of manufactured products in 1925. In that year there were in the State 419 manufacturing establishments; in 1914, 808; and in 1919, 668. The census of manufactures taken in 1927 indicated 446 establishments in the State. Wage earners engaged in manufactories in 1927 numbered 21,016; in 1925, 20,704; in 1914, 22,155; and in 1919, 29,035. The capital invested increased from \$60,905,671 in 1909 to \$69,323,927 in 1914, and \$148,207,598 in 1919. The total value of products increased from \$52,839,619 in 1909 to \$165,073,009 in 1919, and declined to \$125,406,332 in 1925, amounting to \$129,899,735 in 1927, but the war-time increase was due largely to the change in industrial conditions caused by the War, and these figures cannot be used to measure the normal growth of manufactures between 1909 and 1919. It will be noted that the number of establishments decreased to a large extent due mainly to conditions and the elimination of the smaller plants. The most important industries in point of value of products are those connected with the manufacture and tanning of leather. These were valued at \$16,989,208 for 1925; \$9,183,000 in 1914; and \$50,138,000 in 1919. Pulp goods ranked second, with a product valued at \$1,032,000 in 1909; \$9,385,000 in 1919. Car construction and repair products in 1909 were valued at \$3,251,000; 1914, \$3,551,000; and 1919, \$7,687,000; and the products of iron and steel, steel work, and rolling mills in 1909 was valued at \$1,715,000; in 1914, \$1,669,000; in 1919, \$7,115,000. In 1909, Wilmington had 261 establishments, with products valued at \$38,069,000; in 1919, 262, with \$121,040,000; and in 1925 the production attained \$76,502,000.

**Education.** The development of education in Delaware has gone on persistently for many years. As in other Southern States, the mixture of whites and Negroes in the population adds to the difficulty of educational advancement. In 1919 a new school code was put into effect. A school law, passed by the Legislature in 1920 and modified by the Legislature of 1921, provided for a bi-partisan State Board of Education; for improved methods for raising funds for school purposes; consolidations of school districts by referendum vote of the districts involved; continuation of vocational training in agriculture and home economics, and State support of high

schools. Sixty scholarships for the training of teachers in the University of Delaware were provided in 1919 by Pierre S. Du Pont and other members of the Du Pont family. There has been great improvement in the supervision of rural schools and in the provision of industrial training in the colored schools. The enrollment in the public schools increased from 36,000 in 1913 to 39,297 in 1925-26. Of this number, 33,170 were whites and 6127 were colored. In the colored elementary schools, 5830 were enrolled; in the colored high schools, 207. The total expenditure for public day schools for the academic year 1925-26 was: current, \$2,857,935; outlays for new buildings, sites, and equipment, \$774,726. The percentage of illiteracy in Delaware decreased from 10 in 1910 to 7.4 in 1920; among the native whites, from 4.2 to 2.6; among the foreign-born whites, from 19.7 to 18.2; and among the Negroes, from 32.9 to 24.6.

**Finance.** Expenditures in the year ending June 30, 1928, as reported by the U. S. Department of Commerce, were: for maintenance and operation of State governmental departments, \$4,826,035 (of which \$1,406,380 was aid for local education); for interest payments on debt, \$474,073; for permanent improvements, \$2,558,123; total, \$7,858,231 (of which \$2,383,939 was for highways, \$258,167 being for maintenance and \$2,125,772 for construction). Revenues were \$8,968,467. Property and special taxes formed 58.8 per cent of the total; departmental earnings and remuneration for services rendered by officials, 6.3 per cent sales of licenses and a sale tax on gasoline, 23.1 per cent. Property valuation was \$265,582,580; State taxation thereon, \$398,374. Net State funded debt was \$8,448,752. The chief part of the debt was for highways.

**Political and Other Events.** In 1914 a Republican candidate for the House of Representatives, Thomas W. Miller, was elected. Great industrial prosperity was brought about by the War. Some of the largest ammunition factories in America were located in the State. Several serious explosions occurred in ammunition factories during 1916. In 1916 Josiah Wolcott, Democratic candidate, was elected to the United States Senate, while John G. Townsend, Republican, was elected governor. In 1916 Hughes received 26,011 votes for President; Wilson, 24,753. In 1918 L. Heister Ball, Republican, was elected Senator. In 1920 William D. Denny, Republican, won the governorship; for President, Harding received 52,858 votes; Cox, 39,897. In 1922, Thomas F. Bayard, Democrat, was elected Senator. R. P. Robinson (Republican) was elected governor in 1924. The vote for President was: Coolidge, 52,441; Davis, 33,445. In 1928 C. N. Buck (Republican) was elected governor, while Hoover received 68,860 votes for President, to 36,643 for Smith.

**Legislation.** In 1915 an agricultural commission was created. In 1917 the laws relating to the administration of the State government were amended, and so were the child-labor laws. A workmen's-compensation act was passed and measures were enacted to prevent monopolies in the buying and selling of commodities. The Legislature of 1919 created a banking department, passed school laws, and amended the criminal law. In 1921 the Legislature imposed an income tax for school purposes, amended the law in respect to alien land ownership, provided a tax on shares of banking corporations, estab-

lished a child-welfare commission, and adopted legislation for carrying out the education programme of 1920.

**DELBET, PIERRE LOUIS ERNEST** (1861- ). One of the leading surgeons of France. His chief hospital connection was with the Hotel-Dieu, and his principal works are *Du traitement des aneurysmes externes* (1899); *Des supurations pelviennes chez la femme* (1891); *Leçons de clinique chirurgicale faites à l'Hotel-Dieu* (1899); *Grands procès morbides* (1907); *Méthode de traitement des fractures* (1910). In collaboration, he published: *Affections chirurgicales des artères* (1911, with Moquot); *Maladies de l'anus et du rectum* (1916, with Brechet); *Biologie de la plaie de guerre* (1918, with Fiessinger); *Nouveau traité de chirurgie*, with Le Dentu, which came out serially, the first volume in 1907. With Mendaro, he published *Cancers du sein* (1923).

**DELBÜCK, dël'brük, HANS G. L.** (1848-1920). Professor of history at the University of Berlin, *Geheimregierungsrat* (see VOL. VI). In 1920 he became a member of the Historical Committee for the Imperial Archives. His works published since 1913 include *Regierung und Volkswohl* (1914, 1920); *Bismarcks Erbe* (1915); *Krieg und Politik*, 3 vols. (1919); *Geschichte der Kriegskunst*, 4th vol. (1920); *Kautsky und Harden* (1920); *Ludendorff, Tirpitz, Falkenhayn* (1920); *Ludendorffs Selbstporträt* (1922); and *Vor und nach dem Weltkrieg* (1925).

**DELCASSÉ, dël'kásé, THÉOPHILE** (1852-1923). A French statesman (see VOL. VI). In 1913-14 he served as Ambassador at Petrograd, and from 1914 to 1915 was Minister of Foreign Affairs in Viviani's cabinet, having previously served in this capacity in 1905-08 and in 1912. He was recognized as one of the most eminent of French statesmen, and was best known as the founder of the Entente. Consult "L'œuvre de Delcassé," by G. Raynal, in *Pages d'histoire*, No. 85 (1916).

**DELED'DA, GRAZIA** (1875- ). An Italian novelist (see VOL. VI), who received the Nobel Prize for Literature in 1926. Her later works include *Le colpe altrui* (1914); *Marianna Sirca* (1915); *L'incendio nell'uliveto* (1918); *La madre* (1920); *Il segreto dell'uomo solitario* (1921); *Chiaroscuro* (1921), and *Il Dio dei viventi* (1926).

**DELITZSCH, dë'lich, FRIEDRICH** (1850- ). A German Assyriologist (see VOL. VI) who was professor at the University of Berlin and member of the Akademie der Wissenschaften. His works published after 1913 include: *Sumarische Grammatik* (1914); *Sumerisches Glossar* (1914); *Die Grosse Täuschung* (1920; Part 2, 1921, 1922); *Les- und Schreibfehler im Alten Testament* (1920).

**DELIUS, FREDERICK** (1863- ). A British composer, born in Bradford, Yorkshire (see VOL. VI). The production of his opera *Fennimore und Gerda*, which was in rehearsal at Cologne in 1914, was prevented by the outbreak of the War, but had its première at Frankfurt in 1919. He added to the list of his major works: *Requiem* for chorus and orchestra; incidental music to Flecker's *Hassan*; a piano concerto in C minor; a violin concerto; a cello concerto; a concerto for violin and cello; for orchestra: *Brigg Fair*, *Life's Dance*, *Summer Night on the River*, *North Country Sketches*, *In a Summer*

*Garden*; two string quartets; three violin sonatas.

**DELL, FLOYD** (1887- ). An American novelist and critic, born at Barry, Ill. He entered the field of journalism at the age of 18 and in six years was the literary editor of the *Chicago Evening Post*. In 1914 he went to New York to associate himself with Max Eastman in the publication of *The Masses*, a periodical with a radical economic policy and an excellent literary department (1914-17). He did similar work on *The Liberator* (1918-24). Early attempts at writing did not reveal his true métier until the publication of his novel *Mooncalf* (1920). He followed the success of this work with *The Briary-Bush* (1921). These together made a full-length portrait of the American youth of the period: ambitious, curious, aesthetically-minded, but thwarted by the hostility of his environment and his own sentimental heritage. *Janet March* (1923) was a less successful attempt to do the same thing for the young American woman. Other books included: *Were You Ever a Child?* (1919); *Looking at Life* (1924); *Intellectual Vagabondage* (1926); *Outline of Marriage* (1927); *Upton Sinclair* (1927). In 1927 he edited with Paul Jordan Smith *An All-English Edition of Burton's Anatomy of Melancholy*.

**DELOIRME, dë-lörm', EDMOND** (1847- ). A surgeon general of France before and during the World War, many years before which he published his great work *Traité de chirurgie de guerre* in two volumes (1888-1893). When war was declared in 1914, he issued his manual, *Précis de chirurgie de guerre*, which was translated into English for the British Army in 1915. He published *Chirurgie de guerre—fractures* (1917); and *Les enseignements chirurgicaux de la grande guerre* (1920).

**DELTEIL, dël'ti', JOSEPH** (1894- ). A French writer who was born at Pieusse, near Carcassonne, educated in a seminary, and then became a notary's clerk. With the outbreak of the World War, he turned to literature, first attracting wide attention in 1925 when his *Jeanne d'Aro* received the Prix Femina-Vie Heureuse. Various orthodox critics branded it as sacrilegious but Delteil defended himself by claiming it to be a study of Joan the woman, not Joan the saint. In general, his work was fantastic and had a tendency to shock the conservative. His other works include the novels *Sur la fleuve Amour*; *Choléra*; *Les Cinq sens*; the poems *Le Cœur grec*, crowned by the French Academy (1920); *Le Cygne Androgyne*; *Ode à Limoux*; the essays *Discours aux Oiseaux*; *Mes Amours*; *La Passion de Jeanne d'Aro*; *Le Mal de Cœur*; *Perpignan*, and *De J.-J. Rousseau à Mistral* (1928); *On the River Amour* (1929); and the prose epics *Les Poilus* and *La Fayette* (1928).

**DE MILLE, CECIL BLOUNT** (1881- ). An American actor and motion-picture producer, educated at the Pennsylvania Military College and the American Academy of Dramatic Arts. After being successively playwright, actor, and theatrical producer, after 1914 he devoted himself entirely to production for the moving pictures. His best work includes: *Girl of the Golden West*; *The Warrens of Virginia*; *Our Men*; *Joan of Arc*; *The Dream Girl*; *The Woman God Forgot*; *The Devil Stone*; *The Whispering Chorus*; *Don't Change Your Husband*; *For Better, For Worse*; *Male and Female*; *Why*

*Change Your Wife; Something to Think About; The Affairs of Anatol; Fool's Paradise; Manslaughter; The Ten Commandments; The Volga Boatman, and The King of Kings.*

**DE MORGAN, WILLIAM FRENCH** (1830-1917). An English novelist (see VOL. VI). *The Old Madhouse* was published posthumously in 1919, and *The Old Man's Youth*, De Morgan's incomplete novel, was published, with additions by his widow, in 1921.

**DE MUYTER, ERNEST** (?- ). A Belgian airman who won the Gordon Bennett balloon race in 1920, 1922, 1923, and 1924, thus becoming the permanent possessor of the original Gordon Bennett cup. A new trophy was then presented by the King of the Belgians. In 1925 De Muyter came in second, in 1926 third, and in 1927 sixth. He published *La navigation aérienne et les randonnées victorieuses du "Belgica"* (1925).

**DENBY, EDWIN** (1870-1929). An American lawyer and cabinet official born at Evansville, Ind. As a boy, he went to Peking with his father, then Minister to China, and served in the Maritime Customs Service during 1887-94. He then returned to the United States, was graduated in law at the University of Michigan in 1896, and was admitted to practice in the same year. In 1903 he was a member of the Michigan House of Representatives, then was elected from the First Michigan District to Congress, serving during 1905-11. During the War with Spain, he was a gunner's mate on the *Yosemite*, and when the United States entered the World War, he enlisted as a private in the United States Marine Corps, becoming a major on the Reserves' list in that Corps. By appointment of President Harding, he became Secretary of the Navy in March, 1921, but in response to a request from Congress to President Coolidge, he resigned from his office in March, 1924, and returned to Detroit, where he resumed the practice of his profession.

**DENEEN, CHARLES SAMUEL** (1863- ). A United States Senator (see VOL. VI). While engaged in the practice of law at Chicago, he was appointed United States Senator in 1925 to serve the unexpired term of the late Medill McCormick. He was elected to the same office as a Republican for the term 1925-31.

**DENERÉAZ, ALEXANDRE** (1875- ). A Swiss composer, born at Lausanne. He studied under the organist, E. Blanchet, and, from 1891 to 1895, at the Dresden Conservatory. In 1896 he succeeded his former teacher as organist at St. François in Lausanne and became conductor of a male choral society and teacher of theory at the Conservatory. In 1918 he was appointed *dozent* at the university. His works include three symphonies (C, C minor, and E minor); a symphonic suite, *Les Saisons*; symphonic variations, *Scènes de la Vie de Orpheus*; two symphonic poems, *Le Rêve* and *Épopée Symphonique*; the symphonic pieces, *Autour du monde*, *Au Tombeau de Tut-ank-amen*, *St. Antoine au Desert*; *Concerto Grosso*, for organ and orchestra; a violin concerto; a 'cello concerto; three cantatas; three string quartets; incidental music to Morax's *La Dime*; and organ sonatas.

**DENGEL, PHILIPP IGNAZ** (1874- ). German philosopher and professor of general history at the University of Innsbruck. He was born at Elbigenalp in the Tyrol, and studied at the universities of Innsbruck and Berlin.

He was elected member of the Austrian Historical Institute of Rome and specialized on Italian history and politics. His principal works are *Geschichte des Palazzo di San Marco in Rom bekannt als Palazzo di Venezia* (1909); *Die verschollene Mappa Mundi im Palazzo di Venezia* (1912); *Der italienische Irredentismus* (1912); *Palast und Basilica di San Marco* (1913); *Die Südgrenze Deutsch-Tirols* (1919); *Italien auf falschen Wege* (1919); *Südtirol im Lichte des italienischen Irredentismus, Nationalismus und Imperialismus* (1919). He edited *Glauben und Wissen unserer Welt* (1909-20) and, after 1927, *Bausteine für Leben und Weltanschauung*.

**DENGÜÉ, dên'gâ.** The recent extensive epidemic of this affection in Greece recalls the fact that as late as 1922 it visited the Southern States between Alabama and Texas, inclusive, and the city of Galveston alone had 30,000 victims. For many years, the exact nature of this disease and the mode of its propagation were obscure, and it has been confused with epidemic influenza and even with yellow fever of an extremely mild type without jaundice. It is now known to be a specific disease having no connection with any other malady and is diffused by certain species of mosquito. Mosquito propagation is responsible for its occasional appearance in more northerly latitudes in the hot season of the year. The epidemic in Greece has led to some advance in our knowledge of the disease which has been transmitted experimentally by the species of mosquito known as the *Stegomyia fasciata*. The rate of diffusion is relatively slow, four or five months having been required for the disease to become pandemic, even over a small country like Greece. There were two waves of the epidemic, the first being small with several months of latency. As is sometimes the case with influenza, there was a notable tendency to hemorrhages. The alleged deaths from dengüé were mostly due to other affections, as paratyphus and tropical malaria. The original victims were from Egypt.

**DENIKIN, dên'kin, ANTON** (1872- ). A Russian soldier who served in the Russo-Japanese War and in the World War was chief of the general staff under Generals Alexeiev and Brussilov. Following the Russian revolution, he was in command of the western front (June, 1917), and later in that year of the southwestern front. On General Kornilov's death, Denikin took command of his volunteer force Mar. 31, 1918, by February, 1919, with an army of about 100,000 men, he took the offensive against the Soviet government, and by November had established a fighting front from which he advanced a considerable distance in the interior of southern Russia. In February, 1920, he was defeated by the Soviet Army, and in April of that year, he retired to England, giving General Wrangel command over the troops that remained.

**DENIS, de-né, MAURICE** (1870- ). A French painter born at Granville, Manche. He was a professor at the École des Beaux-Arts, one of the so-called Symbolists, and later leader of the Neo-traditionalist School. He studied at the École des Beaux Arts and was strongly influenced by Paul Serusier, who favored synthesis and the use of form and color to express subjective states of mind. He was also one with the Rose Croix group who favored idealist decorative art rather than realism. In 1894 a visit to Italy impressed him with the value of

Italian quattrocento art and influenced his work to a large extent. He found the subjects for most of his important murals in religious pieces and classical mythology. Besides murals, he executed many easel pictures, illustrated books, and contributed to art reviews. In 1902, he was made a full member of the Société Nationale des Beaux Arts and in 1914 he became Chevalier de la Légion d'Honneur. His most important pieces were exhibited at the Salon des Indépendants and the Salon d'Automme, and he was also represented in the Luxembourg, Paris.

**DENISON UNIVERSITY.** A coeducational Baptist institution, founded in 1831, at Granville, Ohio. The student enrollment increased from 575 in 1914, to 889 in the autumn of 1928, while the summer session enrollment in 1928 was 160; the members of the faculty increased from 43 to 61 during the period under review. The productive endowment was increased from \$2,250,000 to \$3,200,000 between 1924 and 1928, and the income in 1928 was \$239,000. Marsh Hall, which was partially destroyed by fire in 1918, was fully reconstructed; Swasey Chapel, seating 1300, was completed in 1925, and plans were formulated in 1924 for the construction of Whistler Memorial Hospital, which was ready for occupancy on Jan. 1, 1929. The gift of a large tract of land by Col. Edward A. Deeds in 1924 made possible the enlargement of the campus and provided the site for Deeds Athletic Field, with a concrete stadium seating 6000, and a field house fully equipped. During the year 1928, the Military Science Department of the institution was discontinued, which resulted in the withdrawal of the Reserve Officers' Training Corps. The inauguration of Avery Albert Shaw, D.D., D.C.L., LL.D., as president of the University occurred on Oct. 21, 1927, and was attended by 96 official representatives from the various colleges and universities of the United States. The subject of Shaw's inaugural address was "A Christian College of Liberal Arts."

**DENMARK.** The smallest of the Scandinavian countries, whose area, by the accession of North Schleswig in 1920, was increased to 16,568 square miles, and whose population, by the census of Nov. 5, 1925, was 3,434,555. The increase in population over the previous census period was distributed evenly between the rural and urban centres. The population of the capital, Copenhagen, was 587,150, in 1925. Other large towns are Aarhus, 76,226; Odense, 52,376; Aalborg, 42,812; Horsens, 28,135; and Randers, 26,856. The population growth is about 1 per cent annually. Emigration was chiefly to the United States, 6300, in 1920; in 1921, 5300; in 1926, 5804. The pre-war yearly average was 9000. North Schleswig has an area of 1538 square miles and a population of 164,500 (1920). The Faeroe Islands count 22,835 inhabitants and an area of 540 square miles.

**Agriculture.** A movement from the land to the cities was shown in Denmark, the tillers of the soil dropping from 40 per cent of the total population in 1900 to less than 35 per cent in 1921. The movement toward the creation of small holdings has been continuous recently; the

law of 1919, in particular, aimed at the parceling up of large estates held in entail. Intensive cultivation and dairy farming are making continued headway through the initiative of the coöperative societies. The World War of course dealt Denmark's agriculture a severe blow, for its prosperity was dependent on its export trade particularly in dairy products and pork. After the War, recovery was rapid. In 1927 there were 523,785 horses, 2,911,949 cattle, 233,000 sheep, 3,728,623 swine, and 18,524,000 hens; in 1910, 535,018 horses, 2,253,982 cattle, 726,829 sheep, 1,467,822 swine, and about 15,000,000 hens. In 1927, 274,000 acres were under wheat; 453,000, rye; 882,000, barley; 1,012,000, oats; and 189,000, potatoes.

**Industry.** Small plants are the rule. In 1914 factories numbered 82,442; in 1925, 89,175. There were employed in 1912, 346,000 hands; in 1925, 392,000. Because of the demands of belligerents during the War, manufacturing activity increased considerably, but the world-wide depression of 1921 brought the country back to its pre-war status. The production of margarine, one of the most important industries, increased somewhat; in 1926 the output was 69,616 tons, compared with a 1911 output of 35,400 tons.

**Commerce.** The trade record for typical years follows, in millions of kroner; value \$268:

Year	Imports	Exports	Average exchange rate
1914	795	867	\$0.2625
1917	1,082	1,065	2959
1920	8,142	1,814	1577
1921	1,697	1,564	1779
1922	1,448	1,173	2095
1927	1,659	1,549	2673
1928	1,734	1,653	2680

In 1926 cattle to the value of \$13,076,000 were exported; pork and bacon to the value of \$218,498,000; and butter to the value of \$112,937,000. Exports and imports by countries for typical years in thousands of kroner, were:

IMPORTS			
Country	1912	1920	1926
United Kingdom	135,887	887,549	185,697
Germany	814,246	532,219	503,658
Sweden	69,080	189,904	98,112
United States	58,833	753,666	262,737
EXPORTS			
Country	1912	1920	1926
United Kingdom	37,312	671,981	856,879
Germany	181,646	826,471	291,217
Sweden	38,852	358,270	111,867
United States	10,568	90,719	12,153

In December, 1926, 1870 vessels of 1,108,300 tons were flying the Danish flag; 638 of these were steamers. During the War, official figures put the shipping losses due to submarine attacks and mines at almost 150 ships, of 230,000 tons. In 1926, 33,073 vessels of 10,431,000 tons entered Danish ports and 34,640 vessels of 10,608,000 tons cleared. Important maritime activities include the opening of the Odense Canal in 1921 and the commencement in 1922 of the Drogden, a channel for larger ships between the North Sea and the Baltic.

**Communication.** At the end of 1927, the country had 4721 miles of road, with 23,740 miles of by-ways. Railways totaled 3153 miles.

The length of state telegraph lines was 9070 miles. By means of radio-telegraph stations at Lyngby, Blaavand, Copenhagen, and Amager, Denmark is in touch with ships at sea and with the United States.

**Finance.** The 1928-29 budget balanced at 412,404,000 kroner, with estimated expenditures for the year of 319,433,000 kroner and revenues of 324,338,000 kroner; with an actual surplus for the year of about 1,000,000 kroner for expenditure. In 1927 the total debt stood at 1,163,000,000 kroner; the 1913 figure was 348,040,923 kroner. The public debt on Mar. 31, 1929 was estimated at 1,172,000,000 kroner, or 340 kroner per capita.

**History.** During the war, because of her proximity to the belligerents, Denmark's position was precarious. Early in August, 1914, it was found necessary to fix prices and regulate exports to prove the country's desire for an effective neutrality. In the war atmosphere, opposing parties quickly came to terms with each other, and a revision of the constitution which had long been agitated was agreed upon. On June 5, 1915, the new constitution was signed by the King. It vested sovereign power in the King through his ministers, forbade the King to declare war without the consent of Parliament, and provided for universal suffrage and proportional representation. Amendments were promulgated on Sept. 10, 1920. The tightening of the submarine campaign in 1917 brought renewed hardships to the Danish population. Rationing was resorted to, and state and local agencies contributed extensively to poor and unemployment relief. Large sums also had to be expended on military defense. As a result, the Government was compelled to resort to loans to make up deficits appearing annually in the budgets.

Following the War, Denmark did not escape the difficulties of reconstruction which other countries experienced. German competition, made possible by the low value of the mark, naturally added to the uncertainty of economic conditions. The cost of living as measured by retail prices gradually rose, so that in 1921 it more than doubled that of the last pre-war year. Based on prices for 1913 considered as 100, the index number for October, 1920, reached 403, but by October of the next year it had fallen back to 202. Although wages up to 1921 kept pace with prices, a certain amount of unrest was generated by the demobilization of troops and the break in foreign markets, particularly among the transport workers. In general, however, the labor situation showed a marked stability, due largely to the high degree of organization of both employers and employees, the Combined Trade Unions enrolling about 280,000 factory and agricultural workers.

Denmark followed in the wake of other countries of northern Europe in establishing elaborate agencies for social insurance in industry. Illness and unemployment pensions and old-age pensions were wholly or partly provided by the state (the budget of 1923 carried 15,346,000 kroner for pension charges alone) and the state also contributed to the unemployment fund of the trade unions. A comprehensive compensation act, passed in 1916, was also in effect.

By 1922 agriculture had almost reached normal. Production of eggs, butter, and bacon showed a remarkable recovery. Late in August,

1922, the unemployed numbered only 30,000. But the country was not to weather the 1921-22 depression too easily. In September, 1922, the Danish Landmandsbank, the most important Danish banking institution, suddenly collapsed, due to business involvements based on the high price levels of preceding years. The Government was obliged to effect a reorganization. Ninety million kroner of the outstanding capital had to be written off, while the Danish National Bank was called on to contribute 30,000,000 kroner toward the bank's new surplus. Public confidence was diverted more and more from private banking and centred in the Danish National Bank. Denmark's foreign trade received a severe blow in 1922, when the United States emergency tariff imposed what seemed prohibitive rates on Danish goods. Of a piece with the economic distress was the renewed interest in emigration schemes. Plans were launched in 1922 for the emigration and settlement of Danish colonists in Madagascar, Lithuania, Central America and South America.

After a bitter political contest, a plebiscite in December, 1916, approved the sale of the Danish West Indies or Virgin Islands to the United States for \$25,000,000. A further diminution of the Danish Empire took place in 1918 when Iceland (q.v.) was granted its independence; thenceforth, Iceland and Denmark were connected only by a personal union under the Danish King. Greenland (q.v.) alone remained a colonial possession. In 1920 Denmark regained part of the province of Schleswig which had been wrested from her by Prussia in 1864. The Peace Treaty provided for two plebiscites in North and Central Schleswig, respectively, and under an international administration, they were held in February and March, 1920. The result was favorable for Denmark in North Schleswig, the vote being 75,000 for union, and 25,000 against; while in the Central district the natives decided by a vote of 51,000 to 12,000 to remain a part of Germany. On Sept. 21, 1920, citizens of Schleswig took part in the Danish general elections for the first time. The parties returned to the Lower House numbered 52 Liberals, representing the farmers; 18 Radicals, representing the small landholders; 48 Socialists, representing the city workers; 27 Conservatives, sitting for the middle class; 3 for Trade Party; 1 Schleswig (German Party). The ministry therefore was formed by the Liberals. The Liberal Premier Neergaard, supported by a parliamentary bloc, remained in power during the troublesome reconstruction years, and was not overthrown until 1924, when parliamentary elections gave victory to the Social Democratic Party (the labor party), despite the inclusion of a capital-levy plank in its platform. After the victory at the polls, a Social Democratic Cabinet was formed under the premiership of Theodore Stauning—but it commanded a majority of only two or three votes, the strength of the parties being: Social Democrats, 55; Liberals, 45; Radicals, 20; Conservatives, 28; Germans, 1. Skillful manoeuvring was required to keep the ministry in power. Late in 1924, however, it did not hesitate to propose practically complete disarmament, on the theory that the country could not be defended in time of war anyway and might as well save the expense of a military establishment. The bill introduced into Parliament called for the replacement of the army by a small



police and patrol force of not more than 7000, the abolition of the navy, and the razing of fortifications. Throughout 1923 the proposal was discussed and the bill, with several changes, was finally put through the Lower House by a majority of one vote (Mar. 1926). In the following year, however, it was rejected by the Landsting.

The most serious labor troubles in the history of the country began in March, 1925, when existing wage agreements expired and new terms could not be agreed upon. Metal industries, cement and sugar factories, the building trades, etc., were drawn into the controversy, which at one time affected 100,000 workmen and threatened to paralyze the whole economic life of the country. The combined strike and lockout lasted until June 8, when government arbitrators finally effected a compromise.

The stabilizing of the krone, which government policy brought rapidly upward toward par, also entailed much economic distress and unemployment. The Government proposed to relieve conditions by granting subsidies to the industries most affected, the money to be raised by a special capital tax. When this proposal failed of parliamentary support, the Government went to the country. The elections on Dec. 2, 1926, resulted in the loss of two seats by the Social Democrats and four by the Radicals, thus wiping out the ministry's slender majority. The Stauning cabinet thereupon resigned and was succeeded in mid-December by a Liberal Party cabinet headed by M. Madsen-Mygdal, which announced a thoroughgoing policy of retrenchment in government expenditures and carried it through in 1927. Due to this policy and other factors, trade and manufacture enjoyed an encouraging revival in 1928.

The question of defense continued to be a troublesome one. The Government's proposal, in December, 1927, of a programme which would increase the effectiveness of existing military forces through reorganization but would reduce military appropriations to accord with the higher value of the krone was opposed both by the Conservatives, who insisted on a greater military establishment, and by the Socialist advocates of disarmament. A similar proposal was presented again by the Government in October, 1928, and aroused heated debate in and out of Parliament. When the measure came to a vote in March, 1929, the Conservatives refrained from voting because of the defeat of their amendment providing for increased forces, and the Government fell. Elections were held April 24, and resulted in a victory for the Social Democrats, who obtained 61 seats, as against 53 in the former Parliament. The Liberals lost 3 of their 46 seats and the Conservatives 6 of their 30. The Radicals' strength remained at 16 votes, the Justice Party obtained 3 seats in place of 2 before, and the Schleswig or German Party kept its single seat. Former Premier Stauning formed a ministry practically the same as the one he had headed before. He proposed to press the disarmament measure, and in spite of the fact that the Upper House was in the control of the opposition, it was felt that because of the sentiment of the country, as shown in the elections, the measure stood a fair chance of being adopted.

In foreign affairs the post-war years were comparatively uneventful. In 1924 Norway and Denmark arrived at an understanding which removed a disagreement of some years with regard

to hunting, fishing, etc., on the east coast of Greenland. Denmark later extended to Great Britain and France the same rights as to Norway. This period also saw the signing of a series of treaties of trade and arbitration with European countries. Soviet Russia was recognized in 1924 and agreements or treaties relating to trade and shipping were concluded with Poland, Latvia, and Czechoslovakia.

With her neighbors to the north, Denmark's relations became particularly cordial. In 1924 a series of agreements were effected establishing Boards of Conciliation to deal with any serious difficulties that might arise between Denmark, Norway, Finland, and Sweden, and later similar arrangements were made with Switzerland, Germany, and other countries. Treaties of arbitration likewise were signed with Germany, France, Poland, Czechoslovakia, and the northern Scandinavian countries, and in 1928 with the United States. The Kellogg Treaty outlawing war was ratified by the Rigsdag on Mar. 2, 1929. In 1928 the only tension with international bearings was that between Denmark and Germany over affairs in Danish and German Schleswig. It was eased when improved economic conditions quieted an unrest in Danish Schleswig which at one time had threatened to break out in a revolt, and when the desires of the population of German Schleswig with respect to their educational needs were satisfied.

**DENNERT, EBERHARD** (1861- ). A German writer on nature and popular philosophy, who was born at Putzerlin near Staargard, Pomerania. He studied at the universities of Marburg and Bonn, and was successively assistant at the Botanical Institute of Marburg, director of the Keplerbund, and editor of the nature department of the *Deutsche Encyclopadie*. Among his numerous works are *Moses oder Darwin* (1907); *Haeckels Weltanschauung naturwissenschaftlich beleuchtet* (1908); *Die Zelle ein Wunderwerk* (1909); *Die geschichtliche Entwicklung der Descendenztheorie* (1910); *Die Welt für sich und die Welt mit Gott* (1913); *Mehr Naturfreude für die Jugend* (1914); *Gibt es ein Leben nach dem Tode?* (1915); *Gott, Seele, Geist, Jenseits* (1916); *Not und Mangel im Lichte der Entwicklung* (1916); *Der Staat als lebendiger Organismus* (1920).

**DENNETT, TYLER** (1883- ). An American author, born at Spencer, Wis., and educated at Bates College and at Williams College. From 1914 to 1916, he was associate editor of *The World Outlook*. He directed the publicity of the Methodist centenary (1916-18), and in 1919-20 held the same position in the Inter church World Movement. He lectured on American history at Johns Hopkins, 1923-24 and since 1927. Since 1924 he has been chief of the Division of Publications, Department of State. He is also known as a lecturer on Asia, having traveled widely in the Orient and in Africa. He is author of *The Democratic Movement in Asia* (1918); *A Better World* (1920); *Americans in Eastern Asia* (1923); *Roosevelt and the Russo-Japanese War* (1924).

**DENNIS, ALFRED PEARCE** (1869- ). An American diplomat, born in Worcester Co., Md., and educated at Princeton University. During the period 1894-1907, he was professor of history at Wesleyan University (Conn.) and at Smith College. In the latter year, he resigned because of ill health, and engaged in business. In 1918 he was commercial attaché at the American Em-

bassy at Rome, and in 1921 held the same post in London. As a representative of the Department of Commerce, he made investigations for Secretary Hoover in Central and Eastern Europe (1922). He became assistant to Mr. Hoover at Washington in 1924 and in 1925 was appointed a member of the U. S. Tariff Commission. A student of political history and economics, he has made frequent contributions on those subjects to the *Atlantic Monthly*, the *Yale Review*, *International Journal*, *Saturday Evening Post*, etc.

**DE NOAILLES, COUNTESS ANNA.** See NOAILLES, COUNTESS ANNA DE.

**DENT, EDWARD JOSEPH** (1876- ). A noted British musicologist, born at Ribston, Yorkshire. He studied at Eton under C. H. Lloyd and later at Cambridge under C. Wood and C. V. Stanford. In 1902 he was elected Fellow of King's College, Cambridge, and soon after began to attract attention through his scholarly researches concerning various periods of musical history. In 1919 he became critic of the *Athenæum* and in 1926 succeeded his former teacher as professor of music at Cambridge. He was one of the organizers of the British Music Society (1919) and was largely instrumental in developing the first Salzburg Festival (1922) into the International Society for Contemporary Music, of which he was the first president. He contributed to Grove's *Dictionary of Music and Musicians*, Cobbet's *Cyclopædia of Chamber Music*, and wrote the chapter on French music for Tilley's *Modern France* and the chapter on English music for Adler's *Handbuch der Musikgeschichte*. He is the author of *Alessandro Scarlatti: His Life and Works* (1905), *Mozart's Operas* (1913), *Terpander or Music and the Future* (1926), *Foundations of English Opera* (1928).

**DENVER.** The capital of Colorado. The population increased from 256,491 in 1920 to 294,200 in 1928, by estimate of the Bureau of the Census. In 1916, after three years' trial of the commission form of government, Denver went back to the mayor-council form. The new charter provided for a small council of nine men and assigned wide powers of appointment and removal to the mayor. Since 1918 the water system has been municipally owned. Zoning and city-planning provisions were put through in 1924, and a programme of paving carried on within the city. From 1924 to 1928, approximately \$7,000,000 was spent on new buildings for the city's public schools, unusually high teaching standards were established, and an improved curriculum adopted. In 1928 Denver completed plans for the construction of the new City and County Administration Building upon its Civic Centre, the structure to cost \$4,250,000. The assessed valuation of property in Denver in 1927 was \$440,118,465, and the net indebtedness was \$32,087,418. The value of manufacturing increased from about \$70,500,000 in 1913 to \$129,889,181 in 1927, and the number of establishments from 738 to 789. According to the U. S. Census of Distribution for 1926 and the U. S. Census of Manufactures for 1927, Denver has an average of 45,000 wage earners in its manufacturing, wholesale, and retail establishments. Its wholesale sales amount to \$323,599,800 yearly. Bank clearings in 1928 were \$1,863,583,000.

**DENVER, UNIVERSITY OF.** A coeducational institution at Denver, Colo., under the auspices

of the Methodist Episcopal Church; founded in 1864. The enrollment increased from 1159 in 1913 to 2714 in 1928-29, and the faculty from 132 members in 1916 to 177 in the autumn of 1928. The summer-school enrollment in 1928 was 820. The library increased from 38,000 to more than 50,000 volumes. In 1924 the University received as a gift the Foster Buildings Property and Leasehold, which, less indebtedness, was estimated at \$500,000. Chancellor, Frederick Maurice Hunter, A.M., Ed.D.

**DEPAUW UNIVERSITY.** A coeducational institution at Greencastle, Ind., under the auspices of the Methodist Episcopal Church; founded in 1837. DePauw grew steadily during the period 1913 to 1928, increasing its student body from 1000, in the former year, to 1616 in the autumn of 1928, with an additional registration of 133 in the summer session of 1928. The total number of volumes in the library was increased to 68,059 in 1928; and the number of members on the faculty was increased from 50, to 91 in the liberal arts college, and 16 in the school of music. The equipment of the University was augmented by the erection of Rector Hall, a dormitory for women; the Clem Studebaker Memorial Administration Building; Longden Hall, a dormitory for men, in 1927; and Lucy Rowland Hall, a dormitory for women, in 1928. The productive funds were increased from \$1,300,000 to \$5,297,853, which included \$2,124,573 assets of the Rector Scholarship Foundation. Additions to the latter fund included approximately \$650,000 in 1927 and \$146,741 in 1928. In the latter year, the University also received \$25,000 to establish the Albert J. Beveridge Fellowship for research in American history. G. Bromley Oxnam, D.D., was inaugurated president in October, 1928.

**DEPENDENTS, DEFECTIVES, DELINQUENTS.** See CHILD WELFARE; MOTHERS' PENSIONS; and JUVENILE COURTS.

**DEPEW, CHAUNCEY MITCHELL** (1834-1928). An American lawyer, orator, United States Senator and railway official (see VOL. VI). He was strongly opposed to pacifism from the outbreak of the World War, and in 1915, after the sinking of the *Lusitania*, urged drastic action against Germany by the United States. Despite his advanced years, he attended to the duties of the chairmanship of the entire New York Central railway system, which position he filled from 1898 until his death. He was an active worker in the cause of good feeling between England and the United States. He published *Some Views on the Threshold of Fourscore* (1914), and *Speeches and Literary Contributions at Fourscore and Four* (1918).

**DEPTH BOMB.** See BOMB, DEPTH.

**DERAIN, ANDRÉ** (1860- ). A French painter, born at Chatou, Seine-et-Oise. He first studied with Carrière, and later fell under the influence of Van Gogh, finally adopting the method of Cézanne, the master of "Les Fauves." About 1908 Derain commenced experimenting in cubist painting, and he gradually adopted the style of the new school, becoming a leader of the younger artists. From the first, his color was subdued, and gray tones predominate in his later landscape and figure paintings. He also did wood engraving. His work includes: "Les Baig-neuses" (1908); "Paysages de Camis" (1909); and "La Route d'Alban" (1921). See PAINTING.

**DERBY, EDWARD GEORGE VILLIERS STANLEY, SEVENTEENTH EARL OF** (1865- ). An English

public official, cabinet minister, and diplomat born in London. He was educated at Wellington College, and later served in the Grenadier Guards (1885-95) and as aide-de-camp to the Governor General of Canada. He was a Lord of the Treasury (1895-1900), chief press censor in South Africa (1900), financial secretary to the War Office (1900-03), Postmaster General (1903-05), member of Parliament from West Houghton division of Lancashire (1892-1906), and Director General of Recruiting (1915-16). In February, 1916, he became chairman of the military air service joint committee, from which office he resigned two months later, and in July of the same year, upon the formation of Lloyd George's government, he accepted the secretaryship of War. In 1918 he was appointed Ambassador to France, from which post he resigned in 1920. From 1922 to 1924, he was again Secretary for War.

**DERCUM, FRANCIS XAVIER** (1856- ). An American neurologist (see VOL. VI). He became professor emeritus of Jefferson Medical College in 1925. He published *Hysteria and Accident Compensation* (1916); *An Essay on the Biology of Mind* (1922); *The Biology of Internal Secretions* (1924), and *Physiology of the Mind* (1925).

**DESCAMPS, dâ'kân', BARON EDOUARD** (1847- ). A Belgian jurist (see VOL. VI). He was president of the International Parliamentary Conference of Commerce in 1928. His later works include: *Recueil international des traités du 19e siècle*, vol. i, 1801-25 (1914), *Recueil international des traités du 20e siècle*, vol. vi, 1906 (1914), both written with others; *Rapport à la Conférence de la Haye sur le règlement pacifique des conflits internationaux* and *Le génie des religions* (1923).

**DESCAVES, dâ'kâv', LUCIEN** (1861- ). A French author (see VOL. VI), who sometimes wrote under the pseudonyms of Compère Guilléri. His later works include: *Bribibi* (1911); *Ateliers d'aveugles* (1912); *Philémon* (1914); *Barabas* (1914); *La Maison anacréon* (1916); *Dans Paris bombardé* (1919); *La Saignée* with Nozière; *Pierre Dupont*, a comedy (1922); *Le cœur ébloui*, drama (1926), and *Les fautes de l'amour*, drama (1928). Consult *Lucien Descaves*, by Emile Morelly.

**DESCHAMPS, ALBERT**. See **PSYCHOLOGY, ABNORMAL**.

**DESCHANEL, dâ'shâ'nêl', PAUL** (EUGÈNE LOUIS) (1856-1922). A French statesman and author (see VOL. VI). In January, 1920, he was elected President of France, but his health soon began to fail, and in May, while on a train near Montargis, he fell from the window, suffering injuries which finally obliged him to resign the Presidency. Though he afterwards appeared in the Senate for a short time, his career was practically over. In 1920 he published *Gambetta*.

**DES MOINES, dē moin'**. The capital of Iowa. The population increased from 86,368 in 1910 to 126,468 in 1920, and to 151,900 in 1928, according to the estimate of the Bureau of the Census. Its area is 55.91 square miles. With a commanding and central location and with a great system of railroad lines and highways radiating in every direction, Des Moines is the industrial, commercial, political, social, financial, and governmental centre of the State. Between 1914 and 1924, the State Capitol Park was increased from 18 to 83 acres by the razing of several city blocks, and a new municipal court

and public safety building was erected on the river front Civic Centre. A diagonal boulevard, Keosauqua Way, was constructed, connecting the business district with the northwest residential section, and Fifth Avenue was widened and graded at a cost for the two projects of more than \$1,000,000. Locations for new units of the public-school system were purchased, and a building programme was partially completed, involving a final cost of approximately \$7,000,000. A new building to house the offices of the Northwestern Bell Telephone Company and two of the exchanges and another building to house the east side exchange and a new set of underground cables have been erected at a cost of \$3,000,000. The U. S. Government is constructing a new building to house Federal offices.

There are more than 400 factories in Des Moines manufacturing a thousand or more different products, the value of which exceeds \$100,000,000 annually. The pay roll in 1927 for 56,547 employees amounted to \$74,679,841. About one-fourth of Des Moines's factory output is made from raw materials produced in Iowa. In addition to being a great industrial and commercial centre, Des Moines is one of the largest insurance centres in the West. It has 43 home offices whose annual income is more than \$100,000,000 and whose total assets are more than \$300,000,000. Bank clearings in 1928 amounted to \$520,231,000. Des Moines is also one of the six largest publishing centres in the United States. More than 80 publications, with a total subscription list of more than 6,000,000 and with issues totaling 148,000,000 annually, are published regularly in Des Moines. This city leads in agriculture publications, its 14 farm journals having a combined circulation of approximately 3,000,000. Iowa's capital received an early start in the development of aviation, and effort is being made to make it an aviation industry centre, as well as an important city on commercial and mail air routes. The taxable valuation of property in Des Moines subject to ad valorem taxes for the city corporation was \$79,896,662 in 1928. The per-capita tax levy for the city, school, State, and county was \$51.59. The net indebtedness, funded or fixed debt less sinking fund assets, was \$18,412,153. Des Moines leads the nation in home ownership with 51.1 per cent.

**D'ESPEREY, LOUIS FRANCHET**. See **FRANCHET D'ESPEREY, LOUIS FÉLIX MARIE FRANÇOIS**.

**DESSOIR, dâ'swär', MAX** (1867- ). A German psychologist, born at Berlin. He was educated in the German universities and passed through the academic *cursus honorum*, becoming professor at the University of Berlin in 1920. As editor of the *Zeitschrift für Ästhetik und allgemeine Kunstwissenschaft*, he was one of the leaders in the empirical study of the principles of taste. He was also interested in the various phases of abnormal psychology and psychical research, and published his findings in a volume on *Jenseits der Seele* (On the Other Side of the Soul, 1920). His *Geschichte der Psychologie* (1911) was translated into English under the title of *History of Modern Psychology*. Among his other works are *Eine Bibliographie des modernen Hypnotismus* (1890), *Das Doppel-Ich* (1896), *Geschichte der neueren deutschen Psychologie* (1903), *Ästhetik und allgemeine Kunstwissenschaft* (1906), *Philosophisches Lesebuch* (1911), *Jenseits der Seele* (1920), and *Diesseits der Seele* (1923).

**DESTROYER.** See VESSEL, NAVAL.

**DETERDING, dê'têr-dîng, SIR HENRI WILHELM AUGUST** (?- ). A Dutchman, the managing director of the Royal Dutch-Shell Company. In 1890 Kessler of the Royal Dutch Petroleum Company, raised Deterding from a bank clerk in Java, where he was born, to be his assistant, and six years later, on the death of Kessler, Deterding was elected managing director of the company. In his conflict with the Standard Oil in China, he made an agreement with the British Shell Company and the French Rothschild concerns whereby they distributed his products (1902). After four years of this agreement, which was not carried out without friction, a merger was arranged, and Deterding was made director of the powerful new interest, which, among other things, provided fuel for the British Navy. During the World War, he was in control of the British petroleum and benzine supplies, and by never allowing the transportation facilities of the army and navy to stall, contributed largely to the allied victory. In 1920 he was made an honorary Knight Commander of the Order of the British Empire.

**DETLEFSEN, JOHN A.** (1883- ). An American zoölogist born at Norwich, Conn., and educated at Dartmouth and at Harvard. He was Austin teaching fellow of Harvard (1908-12) and was at the University of Illinois as assistant professor of genetics (1912-18), associate professor (1918-19) and professor (1919-22). He was professor of the Wistar Institute of Anatomy, Philadelphia, from 1922 to 1925, when he became associate editor of *Biological Abstracts*. Professor Detlefsen wrote on genetics, especially in domesticated animals. He was co-author of *Our Present Knowledge of Heredity* (1926).

**DETONATORS.** See EXPLOSIVES.

**DETROIT.** The chief city of Michigan. Its population rose from 405,766 in 1910 to 993,678 in 1920 and to 1,378,900 in 1928 by estimate of the Bureau of the Census. In 1914 the area of the incorporated city was 41.76 square miles; in 1924, 92.66 square miles; and in 1928, 139 square miles. During the five-year period, 1923-1927, Detroit built 554 miles of new street paving and 223 miles of alley paving at a cost of \$50,479,540 in an endeavor to keep pace with the growth of the city. In 1928 the public works department reported that there were 1495 miles of paved streets, 2238 miles of sewers, 3401 miles of water mains, 2301 miles of gas mains, and 868 miles of street-car and bus lines. At a special election in April, 1928, Detroit voters approved a bond issue of \$30,000,000 for sewer construction, and a plan for the widening of Woodward Avenue to a breadth of 204 feet, with removal and replacement of the Grand Trunk Railway tracks to supply the necessary space, was declared valid by the State Supreme Court. In April, 1922, the city of Detroit voted an authorization of the purchase of the street railway lines of the Detroit United Railway Company for \$19,850,000 and began operation of the lines on May 1. The trackage purchased was 311 miles, and the city added 72 miles of new line to the system. A rapid transit subway plan, which has been under consideration for several years, was submitted to the voters in April, 1929, but failed of approval. The plan offered was the joint proposition of the Street Railway Commission and the Rapid Transit Commission and provided for the construction of the first unit of the system at an estimated cost of \$91,000,000.

Among the many public works which have been constructed since 1914 are the Belle Isle Bridge, the new public library, and the Detroit Institute of Arts, each of which cost \$3,000,000. The River Rouge improvements, including dredging and a new bridge, cost about \$10,000,000. A Detroit-Canada vehicular tunnel under the Detroit River and an international bridge over the river, connecting the city with Windsor, Ont., are under construction at a cost of more than \$25,000,000.

Detroit has an extensive municipal airport, which was established in 1927, two military air fields, two Naval Reserve aviation bases, and several commercial airports, the most important of which is the one operated by the Ford Motor Co. The area of the municipal field comprises 250 acres. At the election in November, 1928, a bond issue of \$5,000,000 was authorized for the acquisition of additional land and the further development of the site, including structures, lighting, and equipment. A hangar and exhibition building, to cost approximately \$1,000,000, are under construction. The exhibition building will be available for the annual All-American Aircraft Show.

The Port of Detroit is one of the most important on the Great Lakes, in 1920 ranking first in exports and imports. In 1927 the total foreign cargo commerce was 338,223 tons. The available water frontage is 24 miles, with more than 13 miles of improved harbor frontage. The port is the home of five steamship lines operating 37 vessels. Detroit's principal industries include motor vehicles, bodies, and parts; iron and steel products; drugs, chemicals, and allied products; brass, copper, and non-ferrous metal products; machinery, foundry, and machine-shop products; paper and printing products; slaughtering and meat packing. In 1928, 254,269 persons were employed in 2078 plants receiving \$429,321,000 in wages; the total value of products manufactured in the metropolitan area was \$2,217,717,000. In 1928 building permits approximating \$10,000,000 were taken out by 219 manufacturing concerns for the construction of new plants or additions to factories. Of these, 14 companies had programmes involving between \$100,000 and \$150,000. The automobile industry, which is represented by such well-known firms as the Ford Motor Co., General Motors Corp., Cadillac Motor Car Co., Hudson Motor Car Co., Chrysler Motor Corp., Studebaker Corp., has especially shown a vast expansion during recent years. There are 3 National banks, 15 State banks, and 11 trust companies in Detroit, whose capital, surplus, and undivided profits in 1928 amounted to \$115,885,914.

In 1928, 28,550 permits were issued for building construction in Detroit and represented a value of \$129,260,285. Among the buildings erected was the Union Trust Building, 40 stories in height and the tallest but one building in the city. The assessed valuation of property in 1928, according to local estimate, was \$3,562,213,760; the net debt in 1927 was \$214,224,000. Detroit has 185 elementary schools, 14 intermediate schools, 14 high schools, 153 parochial schools, 14 schools for the anæmic, and 5 college units. The Cass Technical High School, which is one of the largest high schools in the United States, has more than 13,000 pupils. The total public-school enrollment in 1928 was 232,235; the parochial-school enrollment was 72,132. In 1928 Detroit was declared winner in the inter-

chamber of commerce fire-waste contest for the best showing of fire-waste reduction.

**DETROIT, UNIVERSITY OF.** An institution of higher education at Detroit, Mich., under the auspices of the Roman Catholic Church, founded in 1877. The enrollment of the University increased from 792 in 1918 to 3044 in the autumn of 1928; there were 332 students in the high school in the same year. The faculty increased from 69 to 181 members and the library from 18,000 to 50,000 volumes. A day school of commerce and finance as well as night courses were added in 1922. The institution is conducted by the Fathers of the Society of Jesus, whose services, as well as those of several lay professors, are given gratis. In 1928 productive funds amounted to \$643,213.35. A faculty residence, power house, engineering, commerce and finance, chemistry, and science buildings, and the Soldiers' Tower were completed in 1927. President, the Rev. John P. McNichols, S.J., Ph.D.

**DETTMANN, LUDWIG** (1865- ). A German painter who was born in Flensburg, studied art in Hamburg and at the Academy of Berlin, and traveled in France, Holland, and England. He is known for his landscapes, portraits, and mural paintings. He exhibited in Berlin, Munich, Vienna, Chicago, and Venice, where he received the Grand Prix at the International Art Exhibition (1897), and Milan, where he became honorary member of the Academy of Fine Arts.

**DEUSSEN, doits-sen, PAUL** (1845-1919). A German philosopher and Orientalist (see Vol. VI). He completed his *Allgemeine Geschichte der Philosophie* in 1917. His autobiography was published posthumously in 1922 by his widow, Erika Rosenthal-Deussen.

**DE VALERA, dé vâ-lér'-ä, EDWARD** (EAMONN) (1882- ). An Irish Republican leader born in Charlesville, County Cork, Ireland, and educated at the Christian Brothers' School (Charlesville), Blackrock College, and the Royal University of Ireland. He taught mathematics and languages at several of the Catholic Colleges of Ireland. He first attracted notice in 1916 by his activity in the Easter rebellion, in which he commanded a band of insurgents. This movement, involving a "Provisional Government of the Irish Republic"—it was to be provisional only until the successes of its arms made it permanent—called for, and received, popular support against British rule. After this outbreak had been put down, he surrendered and was sentenced to death, but the sentence was commuted to life imprisonment. He was released in the general amnesty of June, 1917, and wherever he appeared in Ireland he received enthusiastic demonstrations. East Clare elected him to Parliament by a 30,000 majority, and he held this seat until the formation of the Irish Free State in 1922. The Sinn Fein convention elected him President of the Irish Republic (1917) and he was President of Sinn Fein from 1917 to 1925. In the spring, 1918, he was rearrested for his part in plotting another rebellion and a German invasion, but in February, 1919, he escaped from the prison at Lincoln, England, and made his way to the United States. He returned to Ireland in 1921 and became Chancellor of the National University of Ireland. In the same year, negotiations for settlement of the Irish question were begun with the British government. He was against the compromise which resulted in the establishment of the Irish Free State and he op-

posed the Cosgrave government. But shortly he became the leader of Fianna Fail, a Republican party which was more moderate than Sinn Fein. This group was willing to accept the Free State if the oath of allegiance to the King was abolished. However, in 1927 de Valera and his associates took the oath and on August 12 entered the Dail or Chamber of Deputies, thus becoming an opposition party within the government.

**DEVINE, EDWARD THOMAS** (1867- ). An American leader in social work (see Vol. VI). In 1916 he was special agent at the American Embassy in Petrograd. He was chief of the Bureau of Refugees and Relief under the American Red Cross Commission to France (1917-18); member of the U. S. Coal Commission (1922-23); and professor of social economy and dean of the graduate school, American University, Washington, D. C., since 1926. His later works include, *The Normal Life* (1915), *Disabled Soldiers and Sailors* (1919); *Social Work* (1921); *Economic Problems of Mining, Marketing, and Consumption of Anthracite and Soft Coal in the United States* (1925).

**DEVONPORT, HUDSON EWBANK KEARLEY, FIRST VISCOUNT** (1856- ). An English politician and business man, born at Uxbridge and educated at Cranleigh School. He entered the firm of Kearley and Tonge, subsequently becoming a senior partner. In 1892 he entered Parliament as Liberal member for Devonport (1892-1910). He was parliamentary secretary to the Board of Trade (1905-09), was chairman of the Port of London Authority (1909), first Food Controller (1916), and secretary to the Sugar Commission (1917). He was created a baronet in 1908, was raised to the peerage in 1910, and in 1917 was created a viscount.

**DEVONSHIRE, VICTOR CHRISTIAN WILLIAM CAVENDISH, NINTH DUKE OF** (1868- ). A British statesman educated at Cambridge. He entered Parliament as a Liberal in 1891, was Financial Secretary to the Treasury (1903-05), a civil Lord of the Admiralty (1915-16), Governor-General of Canada (1916-21), and Secretary of State for the Colonies (1922-24). From 1923 he was High Steward of Cambridge University, and in 1928 was Chancellor of Leeds University.

**DEVORE, DANIEL BRADFORD** (1860- ). An American soldier, born in Monroe Co., Ohio. He graduated from the United States Military Academy in 1885, served during the Spanish-American War as captain of volunteers and was commissioned captain of the Regular Army in 1899. He rose to the rank of colonel in 1910 and in the following year was appointed brigadier general. He had charge of the training of troops in Illinois and commanded the 167th Brigade in France in 1918. In the following year, he was commander of Camp Logan, Houston, Tex., and in 1920-21 commanded the 10th Infantry at Camp Sherman. In 1921-22 he was adjutant general at Governor's Island, New York Harbor. His career included service in the Philippines, Panama Canal Zone, and as a member of the faculty of the United States Military Academy. He was retired in 1922.

**DEWAR, dü'er, SIR JAMES** (1842-1923). A British chemist (see Vol. VI). In 1915 he published (with G. D. Liveing) *Collected Papers on Spectroscopy*. The Copley Medal of the Royal Society of London was awarded to him in 1910, and the Franklin Medal of the Franklin Institute of Philadelphia in 1919.



**DE WET, de vêt', CHRISTIAN RUDOLPH** (1854-1922). A South African military leader and statesman (see VOL. VI). He was one of the leaders in the rebellion in the South African Union which broke out in 1914. He was defeated at Mushroom Valley by General Botha on Nov. 12, 1914, taken prisoner by Colonel Brits on December 1, and sentenced to a term of six years and to pay a fine of £2000. He was released after one year's imprisonment, however, giving a written promise to take no further part in politics.

**DEWEY, CHARLES SCHUVELDT** (1882- ). An American financial adviser, born at Cadiz, Ohio, who was graduated at Yale (Ph.B., 1904). His early experience in finance was gained in administering the trust estate of his family at Chicago. During the World War, he served in the U. S. Navy as a division officer on the battleship, *Mississippi*. He was vice president of the Northern Trust Company of Chicago, 1920-24, and Assistant Secretary of the U. S. Treasury, 1924-27. Since Nov. 5, 1927 he has been financial adviser to the Republic of Poland and director of the Bank of Poland. For his services in stabilizing Polish currency, he was awarded the Grand Cross with the stars of the Order of Polonia.

**DEWEY, EVELYN** (1889- ). An American educational psychologist, and daughter of John Dewey. She was educated at Barnard College. She is the author of *Schools of To-morrow* (1915), *New Schools for Old* (1919), *Methods and Results of Testing School Children* (1920), and *The Dalton Laboratory Plan* (1922). She was the director of a psychological survey of New York City, 1918-20.

**DEWEY, HARRY PINNEO** (1861- ). An American clergyman, born at Toulon, Ill., and educated at Williams College and Andover Theological Seminary. He was ordained in the Congregational ministry in 1887, and from that year until 1907 served as pastor in various churches. He then became pastor of Plymouth Church, Minneapolis. From 1904 to 1907, he was a director of the Brooklyn Heights Seminary, the Long Island Historical Society, and the Eye and Ear Hospital. He was a member of the National Service Committee of Congregational Churches, 1917-19, and of the National Council Commission on Missions, 1921-27. In 1914 he was made director of the Northeast Neighborhood Settlement House in Minneapolis, and in 1918 of the Pillsbury Settlement House in the same city.

**DEWEY, JOHN** (1859- ). An American philosopher and educator (see VOL. VI). With the death of William James in 1910, Professor Dewey became the leader of the pragmatic school in the United States, and under his direction the emphasis of pragmatism was changed from that of religion and the will to believe to the practical problems of social reconstruction. After the World War, he went on an educational mission to China and Japan. While in Tokyo, he delivered a series of lectures, subsequently published under the title of *Reconstruction in Philosophy* (1902). In 1924 Professor Dewey went on an educational visit to Constantinople, in 1928 he visited Russia and in 1929 delivered the Gifford Lectures at Edinburgh. He was selected as chairman of a League for Independent Action, the nucleus of a new political party, in 1929. A frequent contributor to the *New Republic*, Professor Dewey did not attempt to draw much of a dis-

inction between the immediate exigencies of social action and the more cultural aspects of philosophic inquiry. Both in his *Reconstruction* and in his *Human Nature and Conduct* (1922), we meet with the notion that contemplative ideas (including the mystical belief in a transcendent Deity) are luxuries too great to be indulged in by the modern man because they tend to inhibit his impulses for action. The latter work, moreover, contains a remarkable discussion of the problems of social psychology, with particular emphasis on the much abused topic of instincts. For reasons of social optimism, Professor Dewey rejects the realistic conception of preëxistent determinisms fatally controlling the course of human action; instead, he regards both instincts and habits as existing only from the moment they come into play but with a retroactive power of explanation. Such a solution opens up vistas of critical idealism, perhaps beyond the intentions of the pragmatic philosophy. Professor Dewey's other works after 1914 include: *German Philosophy and Politics* (1915); *Essays in Experimental Logic* (1916); *Democracy and Education* (1916); *Creative Intelligence* (with others, 1917); *Experience and Nature* (1925); *The Public and Its Problems* (1927), and *Characters and Events* (1929). Consult *The Philosophy of John Dewey*, selected and edited by Joseph Rat-  
ned (1928).

**DEWING, THOMAS WILMER** (1851- ). An American figure and portrait painter (see VOL. VI). At the death of Charles L. Freer, in 1919, the Freer collection of Dewing's paintings passed to the National Gallery at Washington, where a room in the Freer Gallery was given over to these works—oil paintings, pastels, silver prints, and screens. A lyric vision, and the exquisite texture of his paintings, evoke about his figures an air of charm and tenderness and mystery.

**DHÈRE, URBAIN.** See BÉRAUD, HENRI.

**D'HERELLE, FELIX H.** (1873- ). A Canadian bacteriologist, born in Montreal. He received his general and medical education in Montreal and Paris and from 1901 to 1908 served as state bacteriologist in Guatemala City and at Merida, Mexico. In 1908 he returned to Paris to enter the Pasteur Institute as a staff member and from 1914 to 1921 was chief of the laboratory. From 1921 to 1923, he held a similar position in the University of Leiden and in 1923-28 he was director of the bacteriological service of the International Sanitary Council of Egypt. In 1928 he became professor of bacteriology at the Yale Medical School. While connected with the Pasteur Institute, he made his remarkable discovery of the bacteriophage, a substance or organism developed in bacteriological cultures which can attack and dissolve the bacteria. His collected writings on this subject were originally published in French, but in 1922 he published a monograph in English with the title *The Bacteriophage* which has gone through several amplified editions, the latest in 1927.

**DIABETES, di'a-bé'tez.** Two radical departures in the treatment of diabetes have been introduced in recent years. The innovations are respectively the Allen fasting treatment and the discovery at the University of Toronto of the organic preparation, insulin, manufactured from the animal pancreas. In contrasting these new resources, it may be stated that the Allen fasting treatment is both curative and able to arrest the progress of the disease when the pancreas

remains able to function. Under favorable circumstances, it is computed that all but about 8 per cent of the patients treated are benefited. The treatment itself is naturally a hardship, as the patient must remain in bed for some weeks, and it cannot be well carried out save in special institutions and under expert care. The field of the insulin treatment is somewhat different. The patient is in an advanced stage of the malady and menaced with death by diabetic acidosis. The injected pancreatic substance makes up for the deficiency of pancreas substance in the body, and so the patient may be kept alive indefinitely as long as he can receive these injections; he may even resume some of his former usefulness. He is not so restricted in his diet as the ordinary diabetic. As in the case of the fasting treatment, the insulin treatment is to be given only by those who are specially instructed, as there is no little danger to the patient from the unskilled use of the remedy.

At first sight, one may think of a paradox in the status of our knowledge of this disease and our ability to control it. Although we are able to control the milder type of case by diet alone and the severe case by the assiduous use of insulin, the disease and incidence mortality have not been correspondingly diminished. This can only mean that the treatment cannot be properly carried out—that to secure results there must be either skilled attendance or the most faithful execution of medical direction by the patient and his friends. One of the most instructive cases on record is that of a young diabetic physician who for nine years by rigid adherence to the Allen dietetic plan kept himself from growing worse; then when insulin was introduced he was able to improve and to lead a normal active life in his profession in addition to marriage and raising a family. When we bear in mind that this patient is not really cured of his disease, the significance of his struggle may be better visualized. See **FOOD AND NUTRITION; DIET; INSULIN.**

**DIAGHILEV, SERGEI** (1872–1929). A Russian producer of ballet. See **BALLET.**

**DIAMONDS.** In no other industry has such excellent control been manifest as in the diamond industry since 1888. During the World War, operations were shut down for one year and in all other periods of depression operations have been curtailed and the danger of overproduction and market demoralization have been avoided. The outstanding feature of the industry in recent years is the tremendous increase in production from the South African alluvial deposits. Following discoveries in the Lichtenberg districts that resulted in an enormous production, diamonds valued at more than £4,000,000 were obtained within six months, under government supervision, from the alluvial fields near the mouth of the Nolloth River, in Namaqualand; in 1929 these were being held by the Union government to be disposed of as the market can absorb them. The continued discovery and development of new alluvial deposits has resulted in a considerable change in the production of diamonds in the Union of South Africa. The 1926 production virtually trebled the previous alluvial production, and brought alluvials to a point where they represented one-quarter of the total production; then 1927 saw another similar increase that brought alluvial production practically on a par with mine production from the standpoint of carats produced, and in value exceeded the mine production.

The output of the diamond mines of the Belgian Congo and Angola have shown a tremendous growth from 23,877 carats in 1914, to 666,290 carats in 1924, and to 1,262,000 carats in 1926. In 1927, however, owing to the heavy productions in South Africa, the output in the Belgian Congo was kept down, but that in Angola showed a considerable increase. Diamonds are being produced in the Gold Coast by several companies, one of which—the African Selection Trust, Ltd.—has estimated their reserves at 9,000,000 carats. New discoveries have been reported at Shinyanga in Tanganyika Territory though production from this region declined in 1928. The thirty-ninth annual report of the DeBeers Consolidated Mines for the year ended June 30, 1927, showed net profit of £1,441,640 as compared with £2,193,430 in the preceeding year and net profit of £3,160,630 for the year ended June 30, 1925.

A feature of 1928 was the establishment of a limited diamond-cutting industry at Kimberly in South Africa. Amsterdam and Antwerp continue as the leading markets for the cutting of gems. Brazil supplies the United States with the diamonds required for industrial purposes.

The leading South African diamond producers renewed their interproducers' agreement governing their quotas of sales to the London Diamond Syndicate in 1925. The new agreement is to remain in force for five years and, at the time it was announced, it served to put to an end rumors that were prevalent that disagreement among the producers was threatening to disrupt the organization of the industry. The quotas in the new agreement are unchanged from those previously ruling.

DIAMOND PRODUCTION OF THE WORLD  
From Mineral Industry  
(In Metric Carats)

	1926	1927
Union of South Africa		
Mines	2,398,784	2,398,681
Alluvial	808,329	2,318,407
Total	3,217,967	4,708,088
Southwest Africa	520,000	500,000 *
Belgian Congo	1,108,000 *	975,000 *
Angola	154,870	201,000 *
Gold Coast	152,148 *	340,020 *
Southern Rhodesia	105	
Tanganyika	6,695	17,168
Brazil	43,198 *	34,018 *
British Guiana	164,156	173,797
Borneo	(c)	(c)
India	(c)	(c)
New South Wales	(c)	(c)
Total	5,874,000	6,950,000

\* Estimated.    \* Exports.    \* Figures not available.

**DIAMONDS, ARTIFICIAL.** See **MINERALOGY.**

**DIAZ, dē'áz, ARMANDO** (1861–1928). An Italian soldier who was born at Naples, educated at the Military College of Turin, and who served in the Libyan War (1911–12). He commanded the 49th Division on the Carso front after the entrance of Italy in the World War, and was promoted to commander of the 23d Army Corps which penetrated the Selo line on the Middle Carso in August, 1917. After the disaster of the Caporetto, when the German and Austrian troops broke the Italian line and forced it to retreat to the Piave River, Diaz was appointed commander-in-chief to succeed General Cadorna (Nov. 8, 1917). He made a brilliant defense and established his reputation as one of the greatest generals of the War. By the end of June, 1918, he had forced the enemy east of the Piave, and on October 27, he attacked across the river and was successful all along the line. A week later, Austria surrendered. In 1921 the King

created him Duca della Vittoria, and in the same year he visited the United States. He was Minister of War in the Mussolini cabinet until ill health forced his resignation (1922-24). In the latter year, he was made a Marshal of Italy.

**DIAZ MIRON, SALVADOR** (1853-1928). A Mexican poet, orator, journalist, and statesman, born in Vera Cruz. He was deputy to the Congreso de la Unión, and became nationally known because of his discourse concerning the "English Debt." For years before his death, he was considered the national poet of Mexico. His most notable works are *A Lord Byron*; *El Czar de todas las Rusias*; *¿Qué es poesía?* and *Lo eterno*.

**DIBELIUS, MARTIN** (1883- ). A German theologian and historian born at Dresden. He specialized on the literature and history of primitive Christianity and other religions. He studied at the universities of Neuchâtel, Leipzig, Tübingen, and Berlin and was professor of theology in Berlin from 1910 to 1915, later becoming professor of New Testament theology at Heidelberg. His principal works are *Die Lade Jahwes* (1906); *Die Geisterwelt im Glauben des Paulus* (1909); *Urchristliche Ueberlieferung von Johannes dem Täufer* (1911); *Isisweihe bei Apulejus* (1917); *Formgeschichte der Evangelien* (1919); *Kommentar zum Jakobusbriefe* (1921); *Geschichtliche und übergeschicht Religion im Christentum* (1925).

**DIBELIUS, WILHELM** (1876- ). A German philologist who specializes on English language and literature, born in Berlin. He successively held professorships in Posen, Hamburg, and other cities before retiring to Godesberg on the Rhine. His principal works are *John Copgrave und die englische Schriftsprache* (1899), *Englische Romankunst* (1910), and an exhaustive study of *Charles Dickens* (1916).

**DICK, GEORGE FREDERICK** (1881- ). An American bacteriologist, who with his wife, Gladys Henry Dick, discovered the apparent cause of scarlet fever, a skin test for susceptibility to the disease, a method of immunization against the same, and an antitoxin for its treatment. Dick was born at Fort Wayne, Ind., and received his medical degree from Rush Medical College in 1905. He wrote a few papers on bacteriology under his own name but upon his marriage to Miss Henry all of their efforts were published jointly. Beginning in 1914, they published papers on general subjects but in 1921 devoted all of their attention to scarlet fever, the first paper on this subject appearing in 1921. The research is still in progress. Thus far, they have published no treatise or general summary. While the entire problem of scarlet fever is not yet solved, their work is regarded as of the highest significance for pathology.

**DICK, GLADYS HENRY.** See **DICK, GEORGE FREDERICK**, above.

**DICKINSON, ASA DON** (1876- ). An American librarian and editor, born at Detroit, Mich. He studied at the Columbia University Law School and the State Library School at Albany, N. Y. In the period 1903-12, he was successively connected with the Brooklyn Public Library, Union College Library (Schenectady, N. Y.), Washington State College Library, and others. In 1912-15 and 1916-18, he was on the editorial staff of Doubleday, Page & Co., and later in the war-service department of the American Library Association at Hoboken, N. J., and Paris, France (1918-19). Since 1919 he has been librarian of the University of Pennsylvania.

His work organizing the Punjab libraries for the Indian government was followed by the publication of *Punjab Library Primer*, in 1917. Mr. Dickinson also published *Europe at War* (1914), *The Kaiser* (1914), *One Thousand Best Books* (1924), *Best Books of Our Time* (1928), and several children's publications along a patriotic vein.

**DICKINSON, G(OLDSWORTHY) LOWES** (1862- ). An English writer on history and religious subjects (see VOL. VI). His later works include *An Essay on the Civilization of India, China, and Japan* (1914); *The European Anarchy* (1916); *The Choice Before Us* (1917); *The Magic Flute* (1920); *War: its Nature, Cause, and Cure* (1923), and *The International Anarchy, 1904-14* (1926). The latter, by an analytical review of the ten years before the World War, intends to show that a reform in international intercourse is necessary, and appeals to the younger generation to effect it.

**DICKINSON, HOBART CUTLER** (1875- ). An American physicist, born at Bangor, Me. He was educated at Williams College and later gained the Ph.D. degree at Clark University. During 1900-01 he was assistant at Williams, but in 1903, entered the service of the United States Bureau of Standards, where in 1923 he became chief of the division of heat and power. His original studies have included papers on thermometry, calorimetry, specific heats of liquids, heats of combustion and fusion, thermal properties of refrigerants, thermal conductivities, and internal combustion engines.

**DICKINSON, SIDNEY EDWARD** (1890- ). An American painter, born at Wallingford, Conn., who studied under George Bridgman, William M. Chase, and Douglas Volk. He received the Philadelphia Prize of the Pennsylvania Academy of Fine Arts in 1923, the Popular Prize of the Corcoran Gallery (Washington, D. C.) in 1924, and the Beck Gold Medal of the Pennsylvania Academy in the same year. In 1927 he became a member of the National Academy of Design. He is represented in the Corcoran Gallery, the Art Institute of Chicago, and the City Art Museum of St. Louis.

**DICKINSON, THOMAS H(ERBERT)** (1877- ). An American writer, born at Randolph, Charlotte County, Va. He studied at Ohio State University, Columbia University, and the University of Wisconsin. During the World War, he was a member of the United States Food Administration (1917-18), and the American Relief Administration, Paris and New York (1919-22). He edited *The Play-Book* (1913-15), and several books on the drama. In addition to articles in magazines, he has published *The Case of American Drama* (1915), *Contemporary Drama of England* (1917), *The Insurgent Theatre* (1917), *Russia in the Red Shadow* (1922), *The United States and the League* (1923), *Playwrights of the New American Theatre* (1925), and *An Outline of Contemporary Drama* (1927).

**DICKINSON COLLEGE.** A coeducational institution of higher learning at Carlisle, Pa., founded in 1783. In recent years, by action of the Board of Trustees student enrollment has been limited to approximately 500; in the fall of 1928, registration was 557 and there were 35 members of the faculty. In the same year, productive funds of the college totaled more than \$900,000, and there were more than 40,000 volumes in the library. A new gymnasium, costing \$230,000, was opened in the fall of 1928. President, Merwin Grant Filler, Litt.D.

**DICKSEE, SIR FRANCIS BEENARD (FRANK)** (1853-1928). A British painter who was president of the Royal Academy (1924-1928). He was born in London, educated at the Rev. Mr. G. Henslow's School in that city, and then studied at the Royal Academy (1880), and under Henry Holiday. Being particularly interested in illustration, he started by drawing for magazines and books, and in 1876 he first exhibited at the Academy. In the following year, his "Harmony" was selected as the picture of the year and was purchased by the Chantrey bequest. Dicksee was made an Associate of the Royal Academy in 1881, and was made a full member 10 years later. Aside from his portraits, notably "A Woman in White" (1928), he gained his popularity with romantic representations. Among his best-known pictures are "The Ideal" and "The Two Crowns" which hang in the Tate Gallery, London, and "The Symbol," "The Crisis," "The House Builders," and "A Reverie" in the Walker Art Gallery, Liverpool. His other important pictures include "The Passing of Arthur," "La Belle Dame Sans Merci," "The Funeral of the Viking," and "The Shadowed Face." He was knighted in 1925, received the D.C.L. from Oxford in 1926, and in 1927 was created a Knight Commander of the Royal Victorian Order.

**DICKSON, LEONARD EUGENE** (1874- ). An American mathematician (see VOL. VI). In 1923 he was the winner of the \$1000 prize of the A.A.A.S. for the most important contribution to science. Among his later writings are *Algebraic Invariants* (1915); *Finite Groups* (1916); *History of the Theory of Numbers* (1919); vol. ii, 1920); *Trigonometry with Practical Applications* (1921); *First Course in the Theory of Equations* (1921); *Algebras and Their Arithmetics* (1923); *Modern Algebraic Theories* (1926).

**DICTIONARIES.** See PHILOLOGY, MODERN.

**DIESCH-KAULFUSS, dësch-koul'fûs, CARL H.** (1880- ). A German librarian, born in Sorau. He studied at the universities of Tübingen and Leipzig and was especially interested in modern literature, the history of the stage, and the Reformation. He is librarian of the state library of Berlin. Among his principal works are *Buch der Reformation* (1917); *Deutsche Dichtung im Strome des Lebens* (1921), and *Bibliographie der germanistischen Zeitschriften* (1927).

**DIESEL ENGINE.** See INTERNAL-COMBUSTION ENGINES; SHIPBUILDING, under *Propelling Machinery*.

**DIET.** The discovery of the vitamins and other advances have added greatly to knowledge of dietetics. It is no longer possible to distinguish between food and drugs, for the end products of protein digestion are closely related chemically to certain active drugs. Some of the amino-acids are known to be stimulants of growth; they agree to this extent with growth-vitamins. The hormones at times present in the diet are of the same nature as those manufactured in the body itself and have the status of drugs. While autointoxication is still imperfectly understood, we know that the action of intestinal bacteria on food can give rise to certain poisonous products, and we can surmise that the behavior known as conjugation, in which the split products of digestion may lose their poisonous properties by uniting with one another, may sometimes fail to take place. A disease may sometimes be controlled by diametrically opposite

plans of diet; everything depends on the individual case. Typhoid fever, often the result of impure and germ-infested drinking water, has often been beneficially treated by semi-starvation; at the other extreme, supposing of course that the digestive processes have not been greatly impaired, equally good results have resulted from stuffing the patient with highly concentrated food. The latter course counteracts the great tendency to lose weight. The dietetic treatment of diabetes was revolutionized, and the application of the Allen fasting treatment has justly been regarded as a great triumph in therapeutics. In this resource, the short fast has been followed by the use of a very light diet slowly increased in nutritive value. The introduction of insulin into the therapeutics of diabetes made possible the use of a more liberal diet.

Acidosis, a form of autointoxication which is not to be confused with intestinal self-poisoning, was shown to play an extraordinary part in the causation of disease. The readiness with which it can now be controlled by diet is one of the greatest recent advances in medicine. The condition develops in actual starvation and in diabetes, in which the carbon of the diet is imperfectly utilized; it may also follow dietetic errors of excess. Acidosis, with its lowering of the normal alkaline reserves of the body, follows on a diet consisting largely of so-called acid-forming foods, some of which have always been regarded as staples. The use of a diet in which alkali formers predominate and even the addition of alkalines to ordinary diet often leads to great improvement.

The beneficial results of the so-called basic diet, from which acid formers are largely omitted, are seen especially in the middle-aged and elderly, and such chronic conditions as high blood pressure and affections usually ascribed to excess of uric acid or slowing up of nutrition with accumulation of waste products in the body, respond remarkably well. In any case of chronic disease or ill health of obscure origin, in which there is reason to suspect the presence of diminished alkaline reserves, the basic diet, which entails no trouble or discomfort, may forestall expensive cures at distant resorts and surgical intervention for the supposed results of focal infection. Important advances in the subject of dietetics are given under ANÆMIA, EPILEPSY, and RICKETS, while the subjects of food deficiency and food poisoning are discussed incidentally under BIOCHEMISTRY, BOTULISM, DIABETES, INSULIN, PELLAGRA, SCURVY, SECRETIONS, INTERNAL, TULAREMIA, and VITAMINS. See also FOOD and NUTRITION.

**DIETRICH, JOHN HASSLER** (1878- ). An American clergyman, born at Chambersburg, Pa., and educated at Franklin and Marshall College and at the Reformed Theological seminary at Lancaster, Pa. He was ordained in the ministry of the Reformed Church in 1905, but before this he held various positions, such as private secretary and manager of *Life's Fresh Air Fund*. From 1905 to 1916, he held various pastorates, becoming in the latter year pastor of the First Unitarian Society in Minneapolis. He is the author of *The Gain for Religion in Modern Thought* (1908); *The Religion of a Sceptic* (1911); *Substitutes for the Old Beliefs* (1914); *From Stardust to Soul* (1916); *The Religion of Evolution* (1917); *The Religion of Humanity* (1920); *Do We Need a New Moral Outlook?* (1922); *The Present Crisis*

in *Religion* (1923); *Humanism—a New Faith for a New Age* (1925); *The Humanist Pulpit* (1926); *The Fathers of Evolution* (1927).

**DIEZ**, dets, JULIUS (1870– ). A German painter who was born in Nuremberg and studied at the Munich Academy and at the Kunstgewerbeschule. He is represented in many galleries, among them the University and German Museum of Munich, and the city halls of Leipsic and Hanover. He received the Grand Prix at Brussels. He was teacher in the School of Arts and Crafts, Munich.

**DIFFENDORFER**, RALPH EUGENE (1879– ). An American clergyman, born at Hayesville, Ohio, and educated at Ohio Wesleyan University, Drew Theological Seminary, and Union Theological Seminary. From 1904 to 1916, he was secretary of the Missionary Education Movement in the United States and Canada. The following year (1916–17), he was educational secretary of the Board of Home Missions and Church Extension and of the Board of Foreign Missions of the Methodist Episcopal Church. He was associate secretary of the Centenary Commission of the Board of Home Missions and Church Extension in 1918, and in 1919–20 served as director of the Home Missions Survey of the Interchurch World Movement. Since 1924 he has been corresponding Secretary of the Methodist Board of Foreign Missions. He is the author of *Child Life in the Mission Lands* (1904); *Junior Studies in the Life of Christ* (1904); *A Modern Disciple of Jesus Christ—David Livingstone* (1913); *Thy Kingdom Come* (1914); *Missionary Education in Home and School* (1917); *The Church and the Community* (1920). He edited *The World Service of the Methodist Episcopal Church* (1923).

**DIKRAN**, KOUTOUMDJIAN. See ARLEN, MICHAEL.

**DILL**, LUDWIG (1848– ). A German artist, especially known for his landscapes, who was born in Karlsruhe and studied at the gymnasium and Technische Hochschule in Stuttgart and the Academy of Munich. He was professor of landscape painting at the Karlsruhe Academy of Arts. His work is represented in many European galleries and in the Carnegie Institute at Pittsburgh. He founded the Munich Secession and was a member of the secessions of Berlin, Vienna, and London and honorary member of Fine Arts of Munich. He was decorated by Austria, Bavaria, and Wurtemberg.

**DILLON**, JOHN (1851–1927). An Irish politician (see VOL. VII). In 1918 he succeeded John Redmond as head of the Irish Nationalist Party and was bitter in denouncing England's methods in coercing the Irish. During the World War, he supported British participation and was among those who favored Ireland's participation in the conflict but opposed conscription in Ireland. Failing of election to Parliament in December, 1918, he retired from public life. He criticized the Free State government after its establishment but failed to secure any general support.

**DILNOT**, FRANK (1875– ). An English author and journalist, born in Hampshire. He was educated privately and began as a newspaper reporter in 1900 on the staff of the *Central News*, London which he left two years later for the *Daily Mail* (1902–10). He was editor of the *Daily Citizen*, a British Labor organ (1912–15), and thereafter was a correspondent for the *Chronicle* to investigate social and eco-

nomic conditions in England. In 1918–19, he was president of the Association of Foreign Correspondents in America and in 1919–20, editor of the *Globe*. His publications, the majority of which give evidence of thorough insight into social and economic conditions in England, include: *The Old Order Changeth: the Passing of Power from the House of Lords* (1911), *Lloyd George the Man* (1917), *The New America* (1919), and *England after the War* (1920). His *Lloyd George the Man* had a second edition with three supplementary chapters in 1923 under the title *Lloyd George*. The indiscriminating admiration of the first edition distinctly ebbed in the supplementary chapters.

**DIMNET**, ERNEST (1866– ). A French writer and clergyman, born at Trelon, northern France, and educated at Cambrai, Lille University, where he studied under the poet, Angellier, and at the Sorbonne. For many years he was head of the English department in Collège Stanislas, Paris, during which he made frequent lecture tours in England and the United States. He resigned in 1923. One of his first works, *Figures de Moines* (1908) was crowned by the French Academy and *Les Sœurs Bronie* (1910) received an English translation in 1927. *France Herself Again* (1914); *The Tendencies of French Thought* (1915); *From a Paris Balcony* (1924); and *The Art of Thinking* (1928), were written in English.

**DINGLER**, HUGO ALBERT EMMANUEL HERMANN (1881– ). A German mathematician and physicist, born in Munich and educated at the high school of Aschaffenburg and at the universities of Erlangen, Göttingen, and Munich. He became a member of the faculty of the University of Munich in 1912. His works include: *The Foundations for a Critique of the Exact Sciences* (1907); *The Boundaries and Aims of Science* (1910); *The Bases of Natural Philosophy* (1913); *The Elements of Physics* (1920); *Remarks on the Theory of Relativity* (1921); *Physik und Hypothese* (1921); *Relativitätstheorie und Ökonomieprinzip* (1922); *Das Problem des absoluten Raumes* (1923); *Der Grundgedanke der Mach'schen Philosophie* (1924), and *Der Zusammenbruch der Wissenschaft und der Primatur der Philosophie* (1926).

**DINSMORE**, CHARLES ALLEN (1860– ). An American clergyman and Dante scholar (see VOL. VII). In 1920 Dr. Dinsmore gave up his pastorate at Waterbury, Conn., and became professor of spiritual interpretation of literature at the Yale Divinity School. In 1920 he was Carew lecturer at the Hartford Theological Seminary. His *Life of Dante* was published in 1919. He also wrote *Religious Certitude in an Age of Science* (1924).

**DINWIDDIE**, ALBERT BLEDSOE (1871– ). An American university president, born at Lexington, Ky., and educated at the University of Virginia and the University of Göttingen, Germany. He began his career with a teaching licentiate in the University of Virginia, in 1888, and held various teaching positions, principally in secondary schools, until 1896, when he was appointed professor of mathematics in Southwestern Presbyterian University. In 1906 he was called to Tulane University as assistant professor of applied mathematics and astronomy. He was made associate professor in 1908, full professor in 1910, dean of the College of Arts and Sciences and director of the summer school from 1910 to 1918, and president in 1918. He



was also elected president of the American Association of University Professors, the Louisiana Council of Education, and other educational associations.

**DINWIDDIE**, EDWIN COURTLAND (1867- ). An American temperance advocate (see Vol. VII). He directed the national campaign for the Constitutional Amendment for the prohibition of the liquor traffic in 1917, was president of the International Congress against Alcoholism in 1920-21, and continued active as an officer of numerous temperance organizations.

**DIPHTHERIA**. An important advance in knowledge of this plague is contained in the application of the Schick test to school children, to determine the relative susceptibility or immunity to infection. Many facts have come to light which contradict popular belief. Diphtheria has commonly been regarded as a disease of the tenement population, while scarlet fever was believed to attack both social extremes indifferently. The Schick test shows plainly that the prosperous enjoy no immunity from diphtheria and that the susceptibility to the infection among the well-to-do is about three times as great as among the indigent. This is offset by the recognition among the prosperous of the importance of segregation. The Schick test has shown also that heredity is a factor.

In any case, susceptibility and immunity are not lasting, and tests have to be repeated at comparatively short intervals. Susceptibility is apt to disappear after the age of two or three years. The Negro child is much more susceptible to the disease than some of the whites, e.g., the Italians. Immunization tests are successful in a proportion varying from 70 to 93 per cent. Reports of results of the application of the Schick test vary much with the locality. Diphtheria was responsible for 20,000 deaths annually in the United States. Susceptibility exists in 85 per cent of all children tested.

The campaign of immunization against this disease in the hope of stamping it out has been successful in the localities where it has been earnestly carried out—chiefly suburban and rural; but the great cities have shown indifference and in 1927 four of them accounted for 88 per cent of the national mortality and at the same time the death rate in these cities shows an increase. For some reason not clear, the immunizing campaign has not been carried out in Europe, and even in Germany, the home of antitoxin, and Austria, the birthplace of the Schick test, there is no movement in this direction. It is true that for some years past the disease has not been a menace, but quite recently the medical journals have been stressing the appearance of a deadly type of the disease—fortunately rare—which has resisted the serum treatment. The old claim that this type of disease represents a mixed infection has been disputed by some health officers, who find that it is a pure virulent diphtheria. The belief has gained ground that an affection like diphtheria cannot be understood unless studied in a long perspective—a century at least. Attention has been called to the fact that the doses of antitoxin have steadily increased in size, since the first introduction of serum treatment. This phenomenon may be explained in several ways.

**DIPLOMACY OF THE WORLD WAR.**

See WAR, DIPLOMACY OF THE.

**DIRIGIBLES**. See AERONAUTICS.

**DIRIGIBLES, IN WARFARE**. See STRATEGY AND TACTICS.

**DISARMAMENT**. See WASHINGTON CONFERENCE AND PAN-AMERICAN CONFERENCES.

**'DISARMAMENT CONFERENCE**. See WASHINGTON CONFERENCE.

**DISCIPLES OF CHRIST**. The fifth largest Protestant communion in the United States, one branch of which is known as the Churches of Christ, congregational in organization. It seeks to restore the union of the churches through a return to the plan outlined in the New Testament without human additions of creeds and formulas. The number of communicants throughout the world increased from 1,362,711 in 1914 to 1,629,383 in 1928. In the United States, there were 8396 churches in 1916, and 7648 in 1926; with respective memberships of 1,226,028 and 1,377,595. Sunday schools numbered 7549 in 1916, with 942,879 pupils; and 6680 in 1926, with 1,000,416 pupils. In addition to varied types of home mission work among Negroes, Indians, Orientals, Mexican-Americans, and immigrants, foreign missions had extended by 1928 to the Belgian Congo, Africa, China, India, Jamaica, Japan, Mexico, the Philippine Islands, Porto Rico, Argentina, Paraguay, and Tibet. The six boards which directed all mission work united in 1920 under the title of the United Christian Missionary Society, with headquarters at St. Louis, Mo. The communion maintained in 1928 a total of 512 foreign-mission schools, with an enrollment of 15,621; and there were 5800 baptisms during that year. The 15 hospitals and 21 dispensaries treated 349,577 patients. In the United States, 25 colleges cooperated with the church's board of education, and Bible chairs were maintained in four State universities. The Men and Millions Movement was started in 1913 to secure \$6,300,000 to equip mission stations and increase the endowment of the educational and benevolent institutions of the communion, to enlist 1000 workers for the mission field, and to start "every member" canvasses as the best plan for securing regular offerings for missions. The movement was completed in 1918. During the fiscal year 1928, the churches of the United States and Canada contributed \$4,063,937.86.

**DISEASES OF PLANTS**. See PLANTS, DISEASES OF.

**DITRICHSTEIN**, LEO (1868-1928). An Austro-American actor-playwright, born in Temesvar, Austria-Hungary. He was educated in Vienna, and made his first appearance with a light opera company in Hungary. He made his New York debut in *Die Ehre*, in 1890. He studied English, and appeared successfully in *Mr. Wilkinson's Widows*, *Trilby*, *Are You a Mason?* *Hedda Gabler*, *Doctor Claudius*, and other plays, as a portrayer of comedy and romantic rôles. He became an American citizen in 1897. Mr. Ditrachstein's greatest success was scored in the play, *The Great Lover*, written by him in collaboration with Frederick and Fanny Hatton, in 1915. He was the author of numerous plays, produced in America and England, among them *Gossip* (with Clyde Fitch, 1895); *A Southern Romance* (1897); *The Last Appeal* (1901); *What's the Matter With Susan?* (1904); *The Ambitious Mrs. Alcott* (1907); *The Million* (from the French, 1911); *The Concert* (1911); *Temperamental Journey* (1912); *The Phantom Rival* (1914).

**DIVISION**. See ARMIES AND ARMY ORGANIZATION.

**DIVORCE.** Since 1914 there has been an extraordinary increase in the number of divorces granted in countries all over the civilized world. There is no question that perhaps the most important single reason contributing to this state of affairs was the new-found freedom of the women. Fundamentalists naturally took alarm; the sanctity of the marriage tie was being threatened. On the other hand, it was possible to demonstrate that persons that received divorces did not stay single for long, but sought other partners in marriage. That is to say, the ease, despite legal obstacles, with which it was possible to obtain divorces merely meant that people were breaking marriage ties because they insisted upon marital happiness. This was something of a gain over the old marriage of convenience, even if it left old-fashioned moralists breathless. While people were getting more divorces, they were also getting more marriage licenses. In 1890 of the total male population in the United States, 34.9 per cent was married; in 1920 the ratio was 41.3 per cent. During the period, the divorce rate had grown tremendously. Divorces have increased from 27,919 in 1887 to 180,853 in 1926; the rate in 1887 was 47 per 100,000 population while in 1926 it had become 152 per 100,000. In 1887, 5.5 divorces took place for every 100 marriages, while in 1926 the ratio was 15 divorces to every 100 marriages.

In 1927 the total number of marriages was 1,200,694, as compared with 1,202,574 in 1926. In 1927 the number of divorces was 192,037, as compared with 180,853 in the previous year. On the basis of population estimates, the number of marriages per 1000 in 1927 was 10.12, as compared with a rate of 10.27 in 1926. In 1927 the divorce rate was 1.62 per 1000, as compared with a rate of 1.52 for the previous year.

The phase of this problem to attract the most public attention was the need for uniformity of legislation. The various States, left to their own resources, had developed a confusing diversity of divorce legislation. In South Carolina, divorce was not allowed; in New Hampshire, there were 14 recognized grounds for a decree. Counting certain duplications, there were in the United States 363 causes for divorce: in one State, New York, unfaithfulness alone; in others, for a variety of reasons down to mere bad temper. The legal complications ensuing on the remarriage of divorced persons were correspondingly abundant and confusing: a marriage legal in one State was bigamous in another, and a child legitimate in one State was illegitimate in another. Naturally, a demand for uniformity was inevitable. The question was agitated along two lines: Federal enactment through a constitutional amendment; and State enactment of a uniform regulatory law. Agitation along Federal lines dates back to 1884, when the first bill was introduced in the lower House for a Federal amendment to the Constitution calling for a uniform marriage-and-divorce law. In recent times, Senator Capper has been sponsoring this type of legislation. His first bill was introduced in 1921; he reintroduced the measure in 1925 and 1927. His proposal calls for Congressional enactment of laws for marriage, divorce, the legitimization of children, and the care of children affected by divorce. The enacting bill called for: 1. A marriage license for marriage. 2. Minimum age for males, 18; for females, 16. 3. No licenses to be granted to

epileptic, feeble-minded, tubercular, or syphilitic persons or to first cousins. 4. Males between 18 and 21 and females between 16 and 18 must have the consent of parents or guardians. 5. Applications for marriage are to be made two weeks before the issuance of the license. 6. The lawful marriage of the father and mother of an illegitimate child shall make it legitimate. 7. Divorce may be decreed upon the following grounds: adultery; cruel and inhuman treatment; abandonment or failure to provide for one year; incurable insanity; conviction of an infamous crime. 8. The final decree may be granted after the lapse of one year only; during which either party may not remarry. 9. All divorce actions must be defended. 10. Alimony may be decreed. 11. In providing for the children, the court shall favor the mother. 12. A divorce decreed in one State shall be recognized in all States. Interestingly enough, the conservatives and the radicals both attacked the Capper Bill. The radical position demanded that collusive divorce be recognized, i.e., where husband and wife both agreed that marriage in their case had proved a failure and should therefore be sundered.

Demands for State action date back to 1879, when the American Bar Association established a committee to consider uniformity. Since that time, there has been established a group known as the Commissioners on Uniform State Laws for the purpose of promoting "uniformity in State laws on all subjects where uniformity is deemed desirable and practicable." This body has been the leading champion of State action and, in fact, has drawn up a series of laws some of which have already been accepted by a number of States. Its Desertion and Non-Support Act has been adopted by 16 States; its Divorce Procedure Act by 2 States; its Annulment of Marriage and Divorce Act by 3 States; its Marriage Evasion Act by 5 States; its Divorce Statistics Act by 1 State; its Marriage Statistics Act by 1 State; its Marriage and Marriage License Act by 2 States; its Migratory Divorce Act by 1 State.

These slow and legal processes have nothing to do with the popular subject of companionate marriage which was widely discussed, beginning with 1927, as a result of a book written by Judge Ben-B. Lindsey. Judge Lindsey's solution for the inadequate marriage-and-divorce codes is a type of marriage under which a childless couple may separate if the marriage has proved uncongenial. Unfortunately, the implications of the term were generally misunderstood, for people began to talk of contracting "companionate marriages" in the same sense that "trial marriages" were once spoken of. At the present time, a marriage is a marriage, regardless of what understanding the parties entering into it may have reached and it may be dissolved only by the lengthy and costly method of divorce. Nowhere in the United States today does the law permit the dissolution of a marriage by collusion and that, in a word, is what most people mean by "companionate marriage."

**Other Countries.** The tendency abroad during the period was markedly toward liberalization of divorce provisions. Spain and Italy (both predominantly Catholic countries), where divorce was not allowed, were in striking contrast. In England, the report of the Royal Divorce Commission, presented in 1912, had recommended an increase of both the causes of

divorce and facilities for divorcement. Although this was steadily opposed by the Church of England and several bills on the subject were defeated during the period, in 1923 a measure was got through by which the terms for a decree, infidelity, were at least made identical for men and women (previously, for women, cruelty or desertion as well as infidelity had been necessary). The prohibitive cost of divorce in England had been somewhat eased by a Poor Person's Act, under which, if an individual did not object to be so classed, a decree might be obtained at a cheaper rate; but up to 1924, only one divorce court (in London) had been established and this condition added greatly to the expense of securing a decree. On the Continent, there was an unmistakable drift toward the adoption of mutual consent as a reason for the dissolution of marriage. In Austria and Russia, this had been legal for Jews; in Holland, the principle was evident in a provision for divorce after five years of judicial separation; Belgium recognized as grounds "mutual and unwavering consent"; and in Portugal and Rumania, mutual consent was accepted, subject to provisions. The new German, Austrian, and Russian legislation on the subject, in adopting mutual consent as a cause, endeavored specifically to provide against an irresponsible attitude toward children or wife. The Scandinavian experiment was most noteworthy. As a result of a comprehensive study of Scandinavian social legislation, 1910-18, divorce legislation was adopted in Sweden in 1915, in Norway in 1918, and in Denmark in 1922, which definitely recognized mutual consent as the fundamental reason for the dissolution of marriage. Separation for a year, however, was required before the granting of the decree. Both parents were required to contribute to the support of children. The question of custody was left to be settled by the parents where possible and where there was involved no danger to the welfare of the child. For cases where divorce was desired by only one party, the grounds were liberal, including such as flagrant neglect, misuse of intoxicants, etc.

**DIX, KURT WALTHER** (1878- ). A German pedagogogue and writer on subjects of education, born in Greiz. He studied at the universities of Dresden and Jena and has devoted himself to teaching and studying child psychology, child hygiene, etc. Among his works are *Erziehung und Nervosität im Kindesalter* (1909); *Körperliche und geistige Entwicklung eines Kindes* (1911-12); *Kindeskunde* (1911); *Entwicklung der Denkkraft* (1921); *Gemütsleben in der frühen Kindheit* (1923); and *Die Reifezeit* (1927).

**DIXON, AMZI CLARENCE** (1854-1925). An American clergyman and author (see VOL. VII). From 1922 to his death, he was pastor of the University Baptist Church, Baltimore, Md. His later works include: *Reconstruction* (1919); *The Birth of Christ, the Incarnation of God* (1919); *Why I am a Christian* (1921); *Higher Critic Myths and Moths* (1921).

**DIXON, JAMES MAIN** (1856- ). An American teacher and author (see VOL. VII). In 1920 he wrote *The Spiritual Meaning of Tennyson's "In Memoriam"* and *Manual of Modern Scots*.

**DIXON, JOSEPH MOORE** (1867- ). An American public official (see VOL. VII). He was Governor of Montana for the term 1921-25. In

1920 he was appointed an Assistant Secretary of the Interior.

**DIXON, ROLAND BURRAGE** (1875- ). An American anthropologist (see VOL. VII). He was professor at Harvard after 1916 and member of the American Commission to Negotiate Peace (1916-18) in Paris. He is a contributor to anthropological and ethnological journals and his most recent works include *Oceanic Mythology* (Myths of the Idonesian, Oceanian, Australian region, published in 1915), *The Racial History of Man* (1923), and *The Building of Cultures* (1928).

**DIXON, ROYAL** (1885- ). An American author, born at Huntsville, Tex., and educated at the Sam Houston Normal Institute and as a special student at the University of Chicago. After spending five years with the department of botany at the Field Museum of Chicago, he entered the literary field as a member of the *Houston Chronicle* staff. He has been a special contributor to the leading newspapers of New York, where he has lectured for the Board of Education. His interest and attention have been directed to immigration. His works include *The Human Side of Plants* (1914); *Americanization* (1916); *The Human Side of Animals* (1918); *Hidden Children* (1922); *Personality of Plants* (1923); *Pharaoh's Bird* (1927).

**DIXON, THOMAS** (1864- ). An American novelist and playwright (see VOL. VII). His photoplay, *The Birth of a Nation*, appeared in 1915, and he published *Fall of a Nation* (1916), *The Way of a Man* (1918), *A Man of the People* (1920), *The Man in Gray* (1921), *The Black Hood* (1924), and *The Love Complex* (1925).

**DJEMAL PASHA, jëm'el pā-shā, (AHMED DJEMAL)** (1873-1922). A Turkish soldier and politician, born at Constantinople. After a French education, he entered the Turkish Army, and soon became lieutenant colonel. He was a major in the Young Turk movement (1908), and in 1911, he was made governor of Bagdad, and shortly after, Vali of Constantinople. About this time, he resigned his military command and devoted himself to politics, becoming Minister of Public Works (1913), and Minister of Marine (1914). These political activities brought upon him the personal antagonism of Enver Pasha. This and his pro-French attitude caused him to be sent to Syria as commander-in-chief of the 4th Army in 1914. Upon being recalled in 1917, he was made commander-in-chief of all the troops except those at the Sinai front, an exception which led to friction. As a result Djemal abandoned military operations, returned to Constantinople, and resumed his duties as Minister of Marine, but opportunities for power did not come his way. In 1918 he fled from Turkey, and in 1919 was condemned to death by a Turkish court martial. He tried to bring about an understanding between Soviet Russia and the Turkish Nationalists. He became military advisor to the Amir of Afghanistan, and was murdered in Tiflis when on business for the Afghan Army.

**DOBRUDJA.** See BULGARIA; RUMANIA.

**DOCKS.** While the U. S. Navy authorities have long recognized the fact that suitable dry docks, or graving docks, as they are sometimes called, are essential in any scheme of naval preparedness, it would seem that the low status of the American merchant marine had led to a

neglect of such facilities in the United States prior to the World War. Indeed it is said that when the United States actively joined the Allies in the War and took over for transport service the former German liner, the *Vaterland*, renamed *Leviathan*, there was no drydock in the United States large enough for that vessel. One of the most important of the existing docks was the Brooklyn Navy Yard Dock at New York. This structure, with a usable length of 700 feet, with a width of 110 feet at the keel blocks and with a depth over the sill of 36 feet, was authorized in 1900 but not completed until 1912. It was a most difficult piece of construction on a bottom of quicksand. The first contractor came to grief in 1908; the second lasted but one year; the third contract involved both a changed design and increased dimensions.

Apparently, the needs of the American Navy and shipping at the time of the World War stimulated the development of dock facilities in the United States, and a number of important docks have since been built.

**Norfolk Navy Yard Drydock.** The United States Navy Yard at Portsmouth, Va., had its facilities increased by the construction of a drydock 1011 feet long, 144 feet wide at the coping, and 40 feet deep, which was opened in April, 1919, after having been under construction since February, 1917. This work involved the excavation of 625,000 cubic yards and the placing of a total yardage of concrete of 185,000. The Norfolk Navy Yard also contained two drydocks, built through the coöperation and financial assistance of the United States Shipping Board during the War, which were completed in 1919 and formally inaugurated on October 31, of that year, by the Queen of the Belgians.

**Commonwealth Drydock.** In 1915 active work was begun on a large drydock at South Boston built by the Commonwealth of Massachusetts which was an important element in the port and harbor development of Boston. This dock at the time of its completion was the largest in the United States, being 1176 feet long and 149 feet, 9 inches wide. It could take care of a ship of 1150 feet in length with a beam of 115 feet and 45 feet draft. It had a capacity of 55,000,000 gallons, and was unwatered by three electric pumps, requiring about two hours for the operation. This dock cost the Commonwealth of Massachusetts over \$3,000,000, and was purchased by the United States Government under authority from Congress for \$4,100,000, being formally taken over by the United States Navy and put in commission on Dec. 22, 1919, the battleship *Virginia* being the first vessel to use the dock.

**Pearl Harbor Drydock.** As early as 1908, the United States Navy began the construction of a drydock at Pearl Harbor, Hawaiian Islands, which was completed and flooded on Aug. 21, 1919. The plans for developing a small naval station located at this point involved the construction of a graving dock 589 feet long, but with the completion of the Panama Canal and the increased size of ships navigating the Pacific Ocean, it was determined to increase its dimensions. Accordingly, the dock was built, 1022 feet long 138 feet wide at the coping, and 39½ feet in effective depth, there being 43½ feet depth from top of coping to floor. This gave a clear water basin 1010 feet long and 1010 feet wide at the bottom clearance. In 1913 a seismic disturbance caused the collapse

of the work under way, and after a technical investigation a modified plan of construction was adopted in 1915, and finished in 1919. A full report of this drydock, the history of its early construction, as well as the adoption of the new design, is contained in the *Transactions of the American Society of Civil Engineers*, vol. lxx, page 223, 1916.

**Balboa Drydock.** In 1916 the new drydock at Balboa, at the Pacific terminal of the Panama Canal zone, was completed with a length of 1000 feet, a width of 110 feet, and a depth of 35 feet over the blocks at mean tide. This structure was one of the important works connected with the shipping facilities of the Panama Canal, and made possible the docking and repair of steamers of considerable size.

**St. John, N. B., Drydock.** The St. John Drydock and Shipbuilding Company in November, 1923, opened its new drydock at St. John, N. B. This new dock was the largest of its kind in the world, having an extreme length of 1225 feet and length over the blocks of 1150 feet. It was so arranged that it could be used in two independent sections, one 650 feet long and the other 500 feet long. There was a patent slipway 720 feet in length and a cradle 240 feet long. The depth over the sill at high tide was 42 feet. The dock was provided with a 70-ton fixed crane and a 20-ton traveling crane.

**Drydock at Quebec.** The Champlain drydock at Quebec, which had been under construction since 1914, was completed in August, 1918. Situated on the south side of the St. Lawrence, and with a length of 1150 feet, a width of 120 feet and depth over the sill of 34 feet at neap tide, and 40 feet at high water at spring tide, it was at the time of its completion one of the largest drydocks in the world, being able to accommodate the largest ships for which the port of Quebec had adequate deep-water berths. This dock was divided into two compartments, with an inner chamber 650 feet in length and an outer one 500 feet in length, the latter being closed by a rolling caisson, while the middle entrance was formed by a floating caisson. For emptying the dock, three main pumps of the horizontal centrifugal type, designed to deliver 63,000 gallons a minute against the total head of 25 feet, were provided. These were operated by electric power and could empty the dock in about two and a half hours.

**American-built Docks in France.** At the mouth of the Loire River in France, during the War, engineers of the American Army constructed a notable timber dock system which provided new berths for 10 vessels in addition to an existing series of docks adjoining, previously constructed by the French. These docks were built of timber supported by wooden piles and were located on mud flats. On their shore side were built long low classification sheds, and further inland a receiving yard, and a departure yard for the handling of freight cars. There was provided specially designed timber rigging for the handling of ships' cargoes, and heavy steel gantry cranes were erected also.

**Floating Docks.** In the period after 1914, there was also an increase in the size and capacity of floating docks which, it will be recalled, could be used at any convenient location, and could be moved from place to place if so desired. At the close of the War, two large floating docks owned by Germany and, at the time, the largest structures of the kind, passed

into the possession of the British. Each of these had an overall length of about 700 feet and a lift of some 40,000 tons. The British Admiralty, however, decided that there was need of a still larger floating dock, and in November, 1922, one was put under construction with a length of 960 feet, and a lifting capacity of 60,000 tons. This was built at the Walker Shipyard of Sir W. G. Armstrong, Whitworth & Co., and was designed for the port of Southampton. This dock which, at the time of its completion, in 1924, was the world's largest floating dock, was of the double-sided, self-docking sectional box type, and consisted of pontoon and two parallel walls divided transversely by seven sections. When in position at Southampton, it was moored by four steel booms 110 feet long, hinged at one end to the dock and at the other extremity to four dolphins of reinforced concrete. When submerged, the dock contains some 80,000 tons of water, to pump out which, 14 motor-driven centrifugal pumps were provided and with all in operation some four hours were required to remove the water. The British Government accordingly had, with the Southampton and the two German docks, three floating docks, each of which was capable of taking a large battleship, such as the *Hood*, and a distinct strategic and maintenance advantage was gained by the fact that all of these docks could be passed through the Suez Canal.

**Bibliography.** Such special constructions as drydocks are generally described only in the more technical publications, such as are published by the engineering societies. In ordinary dock work, few structural improvements or changes have been noted in recent years. Reinforced concrete has of course been widely used, although the older timber construction still holds its important position in such work. On the other hand, important developments have occurred in the application of machinery to dock work in connection with loading, unloading, storing, and shipping. A recent work of interest on these facilities in general is Carleton Greene, *Wharves and Piers* (New York).

**DODD, LEE WILSON** (1879- ). An American author and playwright, born at Franklin, Pa., and educated at Yale. He studied law at the New York Law School and was admitted to the bar in 1902, but gave up law five years later for literature, in which he made distinct accomplishment, but has been criticized as being over novelistic. He is the author of *A Modern Alchemist* (1906); *The Return of Eve* (1909); *Speed* (1911); *The Middle Miles* (1915); *His Majesty Bunker Bean* (1915); *Pals First*; *The Book of Susan* (1920); *Lilia Chenoworth* (1922); *The Girl Next Door* (1923); *The Changclings* (play, 1923); *The Sly Giraffe* (for children, 1923); *The Golden Complex* (1927); *The Great Enlightenment* (verse, 1928).

**DODD, WILLIAM EDWARD** (1869- ). An American historian, born at Clayton, N. C., and educated at Virginia Polytechnical Institute and the University of Leipzig. While successively holding the chairs of history at Randolph-Macon College (1900-08) and at the University of Chicago (1908- ), he wrote *Jeffersons Rückkehr zur Politik, 1796* (1900); *Life of Nathaniel Macon* (1903); *Life of Jefferson Davis* (1907); *Statesmen of the Old South* (1911); *The Cotton Kingdom* (Chronicles of America series, 1919); *Woodrow Wilson and His Work* (1920); and *Lincoln or Lee* (1928). In ad-

dition, he was editor and joint author of the *Riverside History of the United States* (1915) joint editor, with Ray Stannard Baker, of *The Public Papers of Woodrow Wilson* (1924-26); and co-translator of Lamprecht's *What Is History?* (1905).

**DODDS, EDWARD CHARLES** (1899- ). A British physician, biochemist, and chemical pathologist. He was educated at Harrow and the Middlesex Hospital Medical School, where at first he served as student demonstrator in biochemistry. Later, he was made professor of biochemistry in the University of London and held the title of chemical pathologist to several prominent hospitals. When the philanthropist, Courtauld, established a special research institute for Dodds at the Middlesex Hospital Medical School, he returned to that institution as Courtauld Professor of biochemistry. He has collaborated in two books, *Recent Advances in Medicine* (with G. E. Beaumont) and *The Chemical and Physiological Properties of the Internal Secretions* (with F. C. Dickens). One of his notable achievements has been a large-scale method of manufacturing insulin at reduced cost. He was summoned in consultation at the illness of His Majesty, George V, in 1928-29, partly as a result of his study of the action of calcium on the blood.

**DODECANESE.** A group of 12 small islands, the Sporades, off the southwest coast of Asia Minor, among which, politically, Rhodes was included. Most of them, barren rocks, are uninhabited. Of their total population, 100,198 in 1917, the greater part were Greek sponge fishermen inhabiting Rhodes and Cos. During the Libyan War between Italy and Turkey, the Italians occupied the islands, and by the Treaty of Lausanne of 1912, Italy was permitted to continue occupation only as a guarantee toward Turkish evacuation of Tripoli. The Turks claimed to have fulfilled their obligations, but the Italians stayed on. In 1919 the Greek Premier, Venizelos, effected a bargain with Tittoni, Italian Foreign Minister, by which the Dodecanese were to be turned over to Greece and Rhodes to Italy. The disposition of the latter the Italians promised to submit to a plebiscite when Great Britain should promise to do similarly in the case of Cyprus. The Peace Treaty of Sèvres in 1920 transferred the islands from Turkish to Italian sovereignty, while the separate Greco-Italian Treaty signed on the same day, in accordance with the Venizelos-Tittoni agreement, promised all except Rhodes, where a plebiscite was to be held, to Greece. Despite this pledge, Italy continued in occupation of the disputed territory, and shortly afterward repudiated the agreement, on the ground that the Sèvres Treaty had not been ratified. The overthrow of Venizelos, the defeat of Greece in its Asia Minor adventure, and the rise of Italian chauvinism under Mussolini, gave substance to the belief that Venizelos's settlement was only too ephemeral and that Italy rather than Greece was to control the eastern Mediterranean. The soundness of these conjectures was confirmed when, regardless of self-determination and the principle of nationalism, and in a spirit typical of the old diplomacy, the Great Powers in 1923 confirmed Italy's hold on the islands. By article 25 of the Treaty of Lausanne, Turkey renounced all rights over the Dodecanese, Rhodes, and the island of Castellorizzo in favor of Italy. No



mention was made in the treaty of the promised plebiscite. See GREECE; ITALY.

**DODGE, RAYMOND** (1871- ). An American experimental psychologist. He was educated at Williams College and the University of Halle (Germany). In 1896 he was appointed professor of philosophy at Ursinus College, and the following year became associated with Wesleyan University, where he was full professor 1902-24. Since 1924 he has been professor in the Institute of Psychology at Yale. He was selected to conduct experiments on the psychology of nutrition at the Carnegie Institute laboratory (1913-14), and also the psychological effects of alcohol (1915). He became the editor of the *Journal of Experimental Psychology* (1916) and of the *Journal of Comparative Psychology* (1921). He is the author of numerous scientific monographs and papers on the psychology of language, vision, eye movement, and dynamic psychology in general.

**DODGE, WILLIAM DE LEFTWICH** (1867- ). An American artist born at Liberty, Va., who studied in Paris and Munich and entered first place in the examination for the École des Beaux Arts. Mr. Dodge's work as a mural painter is represented in New York by his decorations of the Empire Theatre, of the Waldorf-Astoria Hotel, and of other theatres and hotels. Among his principal works were the decorations of the Café de l'Opéra, Paris, The Folies Bergères Theatre, murals for the Panama-Pacific International Exposition, and for the Flag Room in the capitol at Albany, "Mosaics for the Hall of Records, New York," "Signing of the Peace," at Versailles, and "Taking of the Fort de Vaux." He was chief of color for the Sesquicentennial Exposition at Philadelphia in 1926.

**DOFFLEIN, FRANZ J. T.** (1873- ). A German zoölogist born in Paris. He traveled extensively in the United States, West Indies, and Mexico. He succeeded Weismann as professor of zoölogy at the University of Munich, in 1912, and became professor at Breslau in 1918. Professor Dofflein's published works were on the protozoa, animal biology, and psychology.

**DOHENY, EDWARD LAURENCE** (1856- ). An American capitalist and oil producer, born at Fond du Lac, Wis., who spent his early years prospecting for gold with varying success. Stranded in Los Angeles in 1892, he noticed a wagonload of pitch passing along the street and investigated the hole from which it was taken. He obtained a lease of a lot nearby, and at 225 feet struck a gusher which started the Los Angeles oil field. After finding several other fields and gaining several fortunes, he went to Mexico in 1900 and organized the Mexican Petroleum Company with \$10,000,000 capital, and obtained leases on about 1,000,000 acres of barren land near Tampico. In four or five years, Tampico was a world oil centre. The control of such vast enterprises inevitably led Doheny into political activity. In Mexico, he was charged with being responsible for several revolutions, and he was a large factor in California politics. He was prominent in the transactions in regard to the United States naval oil reserves, and was called to Washington to testify before the investigating committee early in 1924. His testimony revealed that he had lent \$100,000 to former Secretary of the Interior Albert B. Fall, and that a number of ex-cabinet

members and other government officials had been employed by him in connection with the oil leases. The Government's suit against Doheny for cancellation of the lease on naval oil reserve No. 1 at Elk Hills, Calif., was decided in the Federal District Court in June, 1925, in favor of the Government. This was affirmed by the U. S. Supreme Court in 1927.

**DOHERTY, PHILIP JOSEPH** (1856- ). An American lawyer, born at Charlestown, Mass., and educated at the School of Law, Boston University. He practiced in Boston from 1877 to 1908; in the latter year becoming attorney to the division of safety of the Interstate Commerce Commission and, in 1913, chief attorney. Beginning in 1884, he held various political offices, including membership in the Massachusetts House of Representatives. In 1909 he served as special assistant to the Attorney General in the Mondou-N. Y. N. H. & H. R. R. case, involving the constitutionality of the Federal Railway Employers' Liability Act. In 1914 he was on the commission to investigate the finances of the New Haven Railroad. In 1918 he was appointed manager of the property-protection section of the United States Railroad Administration and, the following year, became attorney to the valuation bureau of the Interstate Commerce Commission. He is the author of *The Liability of Railroads to Interstate Employees* (1911).

**DOHNANYI, ERNST VON** (1877- ). A Hungarian pianist and composer, born in Pressburg (see VOL. VII). From 1905 to 1915, he was professor of piano at the Königliche Hochschule für Musik in Berlin, then accepted a similar position at the Hochschule in Budapest, and in 1919 became director. After a few months, he resigned this post to become president of the Philharmonic Society. Since 1920 he has made several pianistic tours of the United States, and in 1925 also appeared as conductor of the State Symphony Orchestra in New York. He added to his works the operas *Tante Simona* (Dresden, 1912), *Der Turm des Wojewoden* (Budapest, 1922; as *Ica's Trum*, Düsseldorf, 1926), *Der Tenor* (Budapest, 1929); two symphonies (F and D minor); *Festouvertüre* for triple orchestra; *Ruralia Hungarica*; a piano concerto in E minor; a violin concerto in D; and considerable chamber music of more than ordinary merit.

**DOHSE, dös, RICHARD** (1875- ). A German historian, born at Lubz, Mecklenburg. He studied at the universities of Munich, Marburg, Geneva, and Rostock, specializing on modern languages and history. He traveled in France and Spain and was journalist, correspondent, and editor of various papers. His principal works are *Colley Cibbers Bearbeitung von Shakespeare's Richard III* (1897); a volume of verse, *Aus stillen Stunden* (1902); *Kunst für die Jugend* (1902); several books of verse in Low German (1902-14); *Moderne deutsche Literatur* (1920); *Deutsche Literatur von Anfang bis Hebbel* (1921); and *Das Niederdeutsche Drama* (1921); *Gustav Kohns, sein Wesen und sein Werk* (1927), and biographies of *Fritz Reuter*, *Wilhelm Holzamer*, and *Fritz Stavenhagen*.

**DOLMETSCH, ARNOLD** (1858- ). A famous British connoisseur of old instruments, born at Le Mans, France. While working as an apprentice in his father's piano factory, he showed such talent for the violin that he was sent to Vieuxtemps in Brussels. After further

study at the Royal College of Music in London, he taught violin at Dulwich College. Becoming the possessor of a viola d'amore, he immediately made himself master not only of that instrument, but of every member of the viol family, and began to collect and repair old instruments. With his wife and a pupil, Kathleen Salmon, he formed a trio, with which he gave recitals of early music written for the old instruments. A tour of the United States, in 1902, attracted so much attention, that Chickering & Sons of Boston placed their factory and a number of their best workmen at his disposal. There he remained until 1909, restoring old spinets, harpsichords, etc. and giving numerous recitals on these instruments. He then continued the same occupation in Paris, where the factory of Gaveau was at his disposal. In 1914 he settled in London and established his own factory at Haslemere, Surrey. With his wife and four children he gave, in 1925, in Haslemere a festival of older music with such success that the Haslemere Festival has become an annual event. In 1928 the Dolmetsch Foundation was established to insure the perpetuation of the festival. Dolmetsch edited two volumes of works of English composers of the sixteenth and seventeenth centuries (1912) and wrote an important book: *The Interpretation of the Music of the Seventeenth and Eighteenth Centuries* (1915).

**DOMBROWSKI**, döm-brôf'skê, ERICH FRANZ (1882- ). A German student of theoretical and practical economy, born in Danzig. He became a well known traveler and editor, and a lecturer at Danzig, Kiel, Berlin, and Leipzig. He wrote *Zehn Jahre deutscher Kulturentwicklung vor dem Kriege* (1915); *Das alte und neue System* (1919); and more recently *Politische Köpfe Deutschlands* (1920); and *Die Männer der Übergangszeit, Köpfe der Gegenwart, Neue Köpfe* (1925).

**DOMINIAN**, LEON (1880- ). An American geographer, born at Constantinople, Turkey. He was graduated at Robert College in 1898 and during 1898-1900 studied at Liège. After traveling in Turkey and Mexico, he served as assistant to the U. S. Geological Survey, instructor in the New Mexico School of Mines, and special writer for the *National Geographic Magazine*. He became connected with the Department of State in 1918, serving it on various technical matters, especially with the American Peace Conference in France during 1919. Since 1921 he has been United States Consul in Rome. He served as a delegate to the 12th International Geographical Congress in Toronto in 1913 and to the 2d Pan-American Scientific Congress held in Washington in 1915. He is the author of *The Frontiers of Language and Nationality in Europe* (1917).

**DOMINICAN REPUBLIC**. See SANTO DOMINGO.

**DONNAY**, dô'nê', MAURICE (1859- ). A French dramatic author (see Vol. VII), whose recent work includes: *Alfred de Musset* (1914); *La Parisienne et la guerre* (1916); *L'Impromptu du paquetage* (1916); *Le Théâtre aux armées* (1916); *Premières impressions* (1917); *Lettres à une dame Blanche* (1917); *Pendant qu'ils sont à Noyon* (1917); *La Chasse à l'homme* (1919); *Dialogues d'hier* (1920); *Sous le sourire d'Elisabeth*, essays (1924); *La vie amoureuse d'Alfred de Musset* (1928), and *Autour du Chat Noir*, miscellaneous (1926).

By 1927 his series, issued under the title *Théâtre Complet*, had reached eight volumes.

**DORGELES**, dôr-zhêl, ROLAND (1886- ). A French novelist, who came to the front with the publication of his war novels, *Les Croix de Bois* (1918) and *Le Cabaret de la Belle Femme* (1921). In spite of the intensity of his subject, his style was that of a sober realism, which was in many ways the equal of the melodramatic pages of Barbusse's *Under Fire*. His other works include *La Machine à finir la guerre* (in collaboration with Régis Gignoux, 1916); *La Boule de qui* (1921); *Saint-Magloire* (1921); *Sous les Ailes de mon moulin* (1922); *Le Réveil des morts* (1923); *On the Mandarin Road*, travel in Indo-China (1926); *Partir* (1926); and *La Caravane Sans Chameaux* (1928). *Les Croix de Bois*, *Saint-Magloire*, and *Partir* were translated into English. Dorgelès received the Prix Femina for 1918 and 1919.

**DORR**, RHETA CHILDE (?- ). An American author and social worker (see Vol. VII). She was war correspondent for a syndicate of 21 newspapers during 1917-18, and was foreign correspondent with headquarters at Prague in 1920-23. Her later books include *Inside the Russian Revolution* (1917), *The Soldier's Mother in France* (1918), *Czechoslovakia* (1921), *A Woman of Fifty* (1924), and *Susan B. Anthony* (1928).

**DORSEY**, GEORGE AMOS (1868- ). An American anthropologist and author (See Vol. VII). Dr. Dorsey severed his connection with the Field Museum of Natural History, Chicago, and the University of Chicago in 1915. He served in the United States Navy in 1918-21 as lieutenant and lieutenant commander, was assistant naval attaché at Madrid in 1918, and naval attaché at Lisbon in 1919-21. He was also adviser on Spanish problems to the American Commission to Negotiate Peace at Paris in 1919. Since 1925 he has lectured on anthropology at the New School for Social Research in New York. He is the author of *Young Lov* (a novel, 1917); *Why We Behave Like Human Beings* (1925); *The Nature of Man* (1927); *The Evolution of Charles Darwin* (1927); and various anthropological researches published by the Field Museum of Natural History.

**DORSEY**, N (OAK) ERNEST (1873- ). An American physicist, born at Annapolis Junction, Md. He was graduated in 1893 from Johns Hopkins, where he was a fellow during 1896-97 and received his Ph.D. After serving as a research fellow at the Yerkes Observatory during 1899, he returned to Johns Hopkins and was an associate in physics until 1901, when he entered the service of the Government as physicist to the Bureau of Soils in the Department of Agriculture. In 1903 he transferred to the Bureau of Standards, in which he attained the rank of physicist in 1917. In 1921 he assumed a consulting relation with the Bureau in addition to his private practice. His principal investigations have included the physics of the soil, absolute measurement in electricity and physics of the medical sciences, including applications of X-rays. Besides many articles contributed to scientific journals, he is the author of *Physics or Radioactivity* (1921).

**DOTTIN**, HENRI GEORGES (1863-1928). A French philologist (see Vol. VII), who became a correspondent of the Institut de France in 1919, and edited the *Revue Celtique*. His later works were *Les anciens peuples de l'Europe*

(1916); *La langue gauloise* (1920); *Les Littératures Celtiques* (1924), and *L'épopée irlandaise* (1925).

**DOUGALL, LILY** (1858-1923). A Canadian novelist (see VOL VII). Among her recent works are *The Practice of Christianity* (1914), and *The Christian Doctrine of Health* (1916). She was part author of *Concerning Prayer* (1916); *Immortality* (1917); *The Spirit* (1919); *God and the Struggle for Existence* (1919); *Arcades Ambo* (1919), a volume of poems, and *The Lord of Thought* (1922).

**DOUGHERTY, PAUL** (1877- ). An American marine painter, born in Brooklyn, N. Y. He was graduated from the Brooklyn Polytechnic Institute and the New York Law School and studied art in Europe, spending much of his time in London, Paris, Florence, Venice, and Munich. In 1906 he was elected an associate of the National Academy and the next year he was made a full member. He is also a member of the National Institute of Arts and Letters. Mr. Dougherty's marine paintings have been exhibited all over the United States and in many parts of Europe and include: "October Seas"; "The Road to Cayey"; "Lake Louise" (Metropolitan Museum, N. Y.); "Sun and Storm" (National Gallery, Washington); "Flood Tide" (Carnegie Institute, Pittsburgh); "Storm Quiet" (Chicago Art Institute); "The Land and the Sea" (Corcoran Gallery, Washington); "Autumn Oaks" (Brooklyn Institute Museum). Among Mr. Dougherty's awards was the gold medal from the Panama-Pacific International Exposition in 1915.

**DOUGHTY, DOU'LI or DOU'TI, ARTHUR GEORGE** (1860- ). A Canadian historian (see VOL VII). In 1917 Doughty was attached to the Canadian Expeditionary Force War Archives Survey and in 1919 he accompanied the Prince of Wales as historian on his Canadian tour. He was a member of the Canadian delegation to the Imperial Conferences of 1923 and 1926. Among his later works appear *The Acadian Exiles* (1915), *A Daughter of New France* (1916), and *Notes on the History of Canada Prepared for the Visit of the Prince of Wales* (1919).

**DOUGHTY, CHARLES MONTAGUE** (1843-1926). An English explorer and author (see VOL VII). His later work was devoted almost entirely to the writing of poetry and poetic drama. *The Titans* appeared in 1916 and *Man-soul, or the Riddle of the World* in 1920. Consult *The Life of Charles M. Doughty*, by D. G. Hogarth (1928).

**DOUGHTY, HOWARD WATERS** (1871- ). An American chemist, born at Baltimore, Md. He was educated at Johns Hopkins University, where he received his Ph.D. in 1905. During 1905-06, he was instructor of chemistry at Missouri and during 1907-08, at Wisconsin, after which he went to Amherst, where he became full professor in 1913. His original investigations have been chiefly in the field of organic chemistry, notably on derivatives of trimethylparaconic and camphoronic acids and on the reactions with various metals of compounds containing the trihalogen methyl group.

**DOUGLAS, DŪGLAS, ROBERT LANGTON** (1864- ). An English art critic, lecturer, and author (see VOL VII). He served in the World War as staff captain at the War Office (1916-17) and was director of the National Gallery, Ireland (1916-23). To the literature of Siennese art, as an authority on which he was best

known, he contributed in 1914 an edition (second) of *Histoire de Sienne*.

**DOUMER, dōō'mē', PAUL** (1857- ). A French statesman (see VOL VII). He was elected to the Senate in 1912, opposed the policies of Briand's war cabinet, and entered that of Painlevé as Minister without Portfolio (1917). In Briand's cabinets of 1921-22 and 1923-26, he was Finance Minister, and in 1927 he was made president of the Senate.

**DOUMERGUE, dōō'mērg', GASTON** (1863- ). A French statesman (see VOL VII). He held the portfolio for the colonies through the ministries of Viviani and Briand (1914-March, 1917), when he was sent to Russia to persuade the Kerensky government not to make a separate peace with Germany and Austria. He was president of the Senate in 1923 and 1924, until his election as twelfth President of France on June 13, 1924. He was the first Protestant and the first bachelor to hold that office.

**DOUMIC, dōō'mēk', RENÉ** (1860- ). A French literary and dramatic critic (see VOL VII), editor of the *Revue des Deux Mondes* (1916- ) and permanent secretary of the French Academy (1923- ). His later works include *Le soldat de 1914*, *Le salut aux chefs* (1915), *Les Élégantes*, and *La Défense de l'esprit français* (1916).

**DOURINE.** See VETERINARY MEDICINE.

**D'OVIDIO, FRANCESCO.** See OVIDIO, FRANCESCO n'.

**DOWLING, AUSTIN** (1868- ). A Roman Catholic archbishop, born in New York City. He graduated from Manhattan College in 1887, and after studying at St. John's Seminary and the Catholic University, was ordained in 1891. He served as pastor in Warren, R. I., and from 1905 to 1912 was pastor of Saints Peter and Paul Cathedral. He was consecrated Bishop of Des Moines in 1912 and Archbishop of St. Paul in 1919.

**DOWNS, LAWRENCE ALOYSIUS** (1872- ). An American railway official, born in Greencastle, Ind. He was graduated from Purdue University in 1894 and in the following year began his railroad career with the Vandalia road. He occupied many important positions with the Illinois Central Railroad until 1920, when he was elected vice president and general manager of the Central of Georgia Railway. In 1924-26 he was president of the same company and of the Ocean Steamship Company, Savannah. Since 1926 he has been president of the Illinois Central System. He was the author of *Development of Banking in Illinois* (1914).

**DOYLE, DOIL, SIR ARTHUR CONAN** (1859- ). A British novelist and spiritualist (see VOL VII). After 1913 Sir Arthur added to his long list of works with *The Case of Oscar Slater* (1914); *The Valley of Fear* (1915); *A Visit to Three Fronts* (1916); *History of the British Campaign in France and Flanders*, vols. i and ii (1915-20); *Danger* (1918); *The Guards Came Through* (1920); *Three of Them* (1923); *Memories and Adventures* (1924); *The Land of Mist* (a novel, 1925); *The Case Book of Sherlock Holmes* (1927), and *The Maricot Deep* (1928). A *New Revelation* (1918); *The Vital Message* (1920); *The Wanderings of a Spiritualist* (1921), and *History of Spiritualism* (2 vols. 1926), were written in connection with his studies in the field of spiritualism. He lectured and debated on the subject of spiritualism in

Europe and America. He related his American experiences in *Our American Adventure* (1923) and *Our Second American Adventure* (1924).

**DRAFT ACT.** See UNITED STATES, *History*.

**DRAFT TREATY OF MUTUAL ASSISTANCE.** See WASHINGTON CONFERENCE.

**DRAGE**, drāj, GEOFFREY (1860- ). An English sociologist (see Vol. VII). He was a member of the Departmental Committees National Register (1915), vice president of the Royal Statistical Society (1916-18), chairman of the Denison House Committee on Public Assistance (1916), and chairman of the Official Statistics Committee (1919). In 1916 he was attached to the War Office in the military intelligence section, and in the following year was director of the Investigation Board of Agriculture. Among his later works may be mentioned: *Ephemera* (1915); *Reorganization of Official Statistics and a Central Statistical Office* (1916); *Pre-war Statistics of Poland and Lithuania* (1918); *The Cost of Public Assistance* (1921); *The Dole and Demoralization* (1923), *The Riddle of Japan* (1925); and *Poor Law Reform* (1927).

**DRAINAGE RECLAMATION.** See RECLAMATION.

**DRAKE**, DURANT (1878- ). An American professor of philosophy. He was born at Hartford, and was educated at Harvard and Columbia Universities. In 1812 he joined the faculty of Wesleyan University, and in 1915 became professor of philosophy and education at Vassar. He was one of a group of seven who published the *Essays on Critical Realism* (1920). Among his other writings are *The Problem of Things in Themselves* (1911); *Problems of Conduct* (1914); *Problems of Religion* (1916); *America Faces the Future* (1922); *Mind and Its Place in Nature* (1925); and *The New Morality* (1928).

**DRAKE UNIVERSITY.** An institution for the higher education of men and women, at Des Moines, Iowa, founded in 1881. The student enrollment increased from 1594 in 1913 to 1735 in the autumn of 1928, and the faculty from 80 to 90 during the same period. The fixed endowment in 1928 amounted to \$1,266,770, and the number of volumes in the library to 51,024, as compared with 26,000 volumes in 1913. Drake University Municipal Observatory was built by the city of Des Moines in Waverland Park in 1921. Arthur Holmes, Ph.D., succeeded Hill M. Bell as president in 1918, and was in turn succeeded by Daniel W. Morehouse, Ph.D., in 1922.

**DREIER**, MARY ELISABETH (1875- ). An American social worker, born in Brooklyn, N. Y., and educated in private schools, at home, and at the New York School of Philanthropy. From 1906 to 1915, she was president of the Woman's Trade Union League, subsequently serving on the executive committee. From 1911 to 1915, she was a member of the New York State Factory Investigating Commission, and in 1915 was appointed to the Board of Education by Mayor Mitchel. She resigned in order to give all her time to work for woman's suffrage. She was chairman of the New York State Committee on Women in Industry of the Advisory Commission of the Council of National Defense and of the Women's Joint Legislative Conference (1918-27).

**DREISER**, THEODORE (1871- ). An American author and journalist (see Vol. VII).

His most important later works are *The Titan* (1914); *The Genius* (1915); *Plays of the Natural and Supernatural* (1916); *A Hoosier Holiday* (1916); *The Hand of the Potter* (1919); *Hey-Rub-a-Dub-Dub*, a book of essays and philosophy; *Book About Myself* (1922); *The Color of a Great City* (1923); *An American Tragedy* (1925); *Moods* (verse, 1926); *Chains*, stories (1927); *A Gallery of Women* (1928); *Dreiser Looks at Russia* (1928); and *The Genius* (1928). From his first novel, he has, with each new book, been accused of immorality. His works show a mind of titanic force dealing with dispassionate insight and compassion with the motives and forces that surround mankind. See *A Bibliography of the Writings of Theodore Dreiser*, by Edward D. MacDonald (1928).

**DRESDEN**, drēz'den, Ger. pron. drās'den. Capital city of the Free State of Saxony, Germany, and of the County of Dresden (see Vol. VII), the sixth largest city of Germany. It is situated on both sides of the river Elbe where it is 170 yards wide. The number of inhabitants was 548,308 in 1910; 529,326 in 1919; and 619,157 according to the census of June 16, 1925.

Of the many industries, cigarettes, porcelain, pottery, glass, sewing and writing machines, chocolate, photographic apparatus, tinware, and bicycles are the most important. In 1922 there were more than 100,000 factory workers in the city, the industrial centre is largely near the railroad and the Elbe, and because it spreads out beyond the boundaries of the city, the appearance is not that of an industrial centre. Dresden has a stock exchange, a chamber of commerce, a branch of the Reichsbank, and other banks of importance. With 2300 meters of quays, warehouses, and other facilities, it is the fourth port of transshipment of the Elbe. In 1924, 2507 craft with 237,100 tons of goods entered the city and 2477 craft with 129,800 tons of goods left the city. Also 12,572 tons of floating wood entered the city. It is the seat of three shipping companies, has an airport connecting with various parts of Europe, and also seven railroad lines, several stations, and a railroad bridge over the Elbe.

Dresden is governed by a chief burgomaster, two burgomasters, 30 aldermen, and a council of 84 city representatives. In 1927 a new system of supplying the city with electricity for both light and power was installed.

**DRESEL**, ELLIS LORING (1865-1925). An American diplomatist, born at Boston, Mass., and educated in private schools in the United States, Switzerland, and Germany, and at Harvard University. He practiced law in Boston from 1892 to 1915, then went to Berlin as attaché of the American Embassy, and until 1917 was special representative of the State Department there. On the declaration of war by the United States, he was sent to Berne in the same capacity. He organized the Central Committee for American Prisoners, and was the representative in Switzerland of the American Red Cross and of the War Trade Board. He became first secretary of the Legation in 1918, and in the same year, attaché with the American delegation to the Peace Conference in Paris. He was named honorary counselor to the American Embassy in 1919, but did not enter upon his duties, being appointed American commissioner to Germany in the autumn of the same year. As plenipotentiary of the United States

Government, he signed the peace treaty with Germany on Aug. 25, 1921. He was chargé d'affaires in Berlin, 1921-22.

**DRESSER, HORATIO WILLIS** (1866- ). An American author prominent in the New Thought movement. He was born at Yarmouth, Me., and educated at Harvard University. He early began his career as a telegraph operator and railroad agent in California, but returned to Boston and became editor and publisher of the *Journal of Practical Metaphysics* (1896-98) and of the periodical entitled *The Higher Law* (1899-1902). He was assistant in philosophy at Harvard, 1903-11. His writings, which are mostly philosophical, include: *The Power of Silence* (1895); *The Perfect Whole* (1896); *In Search of a Soul* (1897); *Methods and Problems of Spiritual Healing* (1899); *Education and the Philosophical Ideal* (1900); *A Book of Secrets* (1902); *Health and the Inner Life* (1906); *A Physician to the Soul* (1908); *A Message to the Well* (1910); *Human Efficiency* (1912); *The Religion of the Spirit in Modern Life* (1914); *Handbook of the New Thought* (1917); and *The Victorious Faith* (1917). He edited *On the Threshold of the Spirit World* (1919); *A History of the New Thought Movement* (1919); *The Open Vision* (1920); *The Jumbly Manuscripts* (1921); *Spiritual Health and Healing* (1922); *Psychology in Theory and Application* (1924); *Ethics in Theory and Application* (1925); and *History of Ancient and Medieval Philosophy* (1926).

**DRESSLER, WILLY OSKAR** (1876- ). A German writer on art and interior decoration, born in Berlin. His principal works are *Möbel im Zimmer der Neuzeit* (1901); *Moderne Silbergeräte* (1902); *Geschichte des Porzellans* (1904); *Kunstgewerbe oder angewandte Kunst in Beziehung zur künstlerischen Kultur* (1910); *Neugestaltung der Veraltung der Kunstangelegenheiten im Reich und in den Bundesstaaten* (1917); *Der Eckstein in der Wirtschaft von den Werkleuten vergessen!* (1921).

**DRIESCH, DRËSH, HANS A. E.** (1867- ). A German biologist and philosopher (see Vol. VII). In 1921 he became professor at the University of Leipzig. His writings after the World War were largely concerned with speculative and metaphysical problems. Professor Driesch was also very much interested in psychical research and served on committees investigating various spiritistic mediums. His published works after 1914 include *Leib und Seele* (1916); *Wirklichkeitslehre* (1917); *Wissenschaft und Denken* (1920); *Metaphysik* (1924); *The Crisis in Psychology* (trans., 1925), and *The Possibilities of Metaphysics* (trans., 1926).

**DRINKWATER, JOHN** (1882- ). An English poet, playwright, and critic, born at Leytonstone, Essex. He was educated at the Oxford High School and served for 12 years as insurance clerk. He then turned his attention to theatrical enterprises and became manager and producer to the Pilgrim Players, who later developed into the Birmingham Repertory Theatre Company. His first volume of poems appeared in 1908 and his first play, *Cophetua* (in verse), in 1911. After that he wrote a great many plays, poems, and critical studies. Among the latter are *Critical Studies of William Morris* (1912); *Swinburne* (1913); *The Pilgrim of Eternity: Byron, a Confliot* (1925); *Mr. Charles, King of England* (1926); *Oliver Cromwell: a Character Study* (1927); and *Charles James Fox* (1928). Some of his plays are *Abraham Lincoln*

(1918), the best known to Americans; *Loyalties* (1919); *Mary Stuart* (1921); *Oliver Cromwell* (1921); *Preludes* (1922); *Robert E. Lee* (1923); *Robert Burns* (1925); and *Bird-in-Hand* (1928). The *Collected Plays* appeared in 1925 and *The Gentle Art of Theatre Going* in 1927. In 1923 his *Collected Poems* came out, the next year he published an *Anthology of English Verse*, and *Victorian Poetry. All About Me; Poems for a Child*, appeared in 1928. In 1929, with Henry Seidel Canby, he published *Twentieth Century Poetry*.

**DROP BOMBS.** See BOMBING OF VESSELS BY AIRCRAFT; ORDNANCE.

**DRUMMOND, SIR (JAMES) ERIC** (1876- ). An Englishman, Secretary General to the League of Nations since its foundation in 1919. He was educated at Eton, entered the Foreign Office in 1900, and served as private secretary to the under-Secretary of State for Foreign Affairs from 1906 to 1910, with the exception of a short period in 1908, when he was précis writer to Sir Edward Grey, the Foreign Secretary, filling this office also in 1910-11. He then was one of the private secretaries of Premier Asquith (1912-15), and private secretary to the Foreign Secretary (1916-19), accompanying Mr. Falfour on his special mission to the United States in 1917. See LEAGUE OF NATIONS.

**DRURY, ALFRED** (1859- ). An English sculptor, born at London. After attending the New College School, Oxford, he went to the Oxford School of Art, and to the National Art Training School, later studying in Paris under Dalou. After the World War, the French influence predominated in English sculpture, and Drury was one of its chief exponents. His extensive work varies from interpretative figures to marble portrait busts. He was elected to the Royal Academy in 1913, and is an Associate of the Royal Cambrian Academy. See SCULPTURE.

**DRURY, FRANCIS KEESE WYNKOOP** (1878- ). An American librarian, born at Ghent, N. Y., and educated at Rutgers College and the University of Illinois. He was assistant librarian at the Gardner A. Sage Library, New Brunswick, N. J., (1899-1903); acting and assistant librarian at the University of Illinois (1907-19); assistant librarian, Brown University (1919-20), and assistant professor at Brown (1920- ). He is known as a compiler and editor. Following are his published works (compilations): *List of Serials in the University of Illinois Library* (1911); *Technical and Scientific Serials in the Library of Providence* (1920); *Some of the Best Dramas* (1917); *Plays of Today* (1921); *Novels Too Good to Miss* (1926). He also wrote *College Life and College Sport* (1924), and *Viewpoints in Modern Drama* (1925).

**DRURY COLLEGE.** A non-sectarian coeducational college founded at Springfield, Mo., in 1873. The number of students increased from 276 in 1914 to 463 in 1928, the faculty from 21 to 33, and volumes in the library from 30,000 to 45,000. The productive funds, in 1928, amounted to \$900,000, annuities to \$370,000, and the annual income to \$115,000. In the five-year period, 1923 to 1928, three new buildings, Wallace Hall, a dormitory for girls, Clara Thompson Hall of Music, and Harwood Library, were erected at a total cost of \$250,000. President, Thomas W. Nadal, Ph.D., LL.D.

**DRYDOCKS.** See DOCKS.

**DUANE, ALEXANDER** (1858-1926). An American physician, ophthalmologist, and au-



thor, born in Malone, N. Y. He received his degree in arts at Union College in 1878 and in medicine at Columbia University in 1881. While practicing as an ophthalmologist in New York, he served as medical editor to *Webster's International Dictionary*, the *Oxford Dictionary* and other less-known works and as collaborator in several important works on the eye. In 1892 he brought out an American edition of Fuchs' *Textbook of Ophthalmology*, which has gone through seven editions, and in 1903 his *Student's Medical Dictionary*. He was active during the Spanish-American War and again in the World War in the signal service. In 1899 he had published a manual of signalling which was adopted as a textbook by the United States Government.

**DUANE, WILLIAM** (1872- ). An American physicist, born at Philadelphia, Pa. He was graduated at Pennsylvania in 1892 and received his Ph.D. at Harvard in 1897. During 1907-13, he worked as an investigator at the Curie radium laboratory in Paris, then returned to Harvard, where in 1917 he became professor of biophysics. His principal investigations have been studies on the velocity of chemical reactions and induced activity, alpha rays of radium, heat effects of radioactive substances, ionization, and absorption and emission spectra of X-rays, on all of which topics he has published valuable papers. During the World War, he was chairman of the committee on X-rays in the Section on Physical Sciences of the National Research Council. For his researches in radioactivity and X-rays he was awarded the John Scott Medal and premium of \$800 (1922), the Comstock Prize of \$1,000 by the National Academy of Science (1922), and the first Leonard Prize of \$500 by the American Roentgen Ray Society (1923).

**DUBLIN.** Capital of the Irish Free State (Saorstát Éireann) and seat of political power for 26 of the 32 counties of Ireland. The population of Dublin County Borough in 1926 was 316,693. In May, 1921, the Customs House, the General Post Office, and the Four Courts were destroyed by fire but are being rebuilt; most of the business section along Sackville Street also was burned out. The famous dome of the Four Courts, which was a striking object to visitors approaching the Irish capital from the sea, has been restored. The Irish Free State Parliament (Dáil Éireann) is housed in the former residence of the Duke of Leinster and is flanked on either side by fine modern buildings, the National Museum and the National Library. The National Museum contains one of the finest collections of ancient gold ornaments in the world, dating back to pre-Christian times and a testimony to Irish culture in the past. Abbey Theatre has been made the centre of the Nationalist movement in drama and is devoted exclusively to the production of plays Irish in character and origin. Dublin Castle, where the Lord Lieutenant or Viceroy of Ireland formerly held his court, is the seat of the Courts of Justice. The corporation has spent more than £300,000 in the clearance of unsanitary areas and £2,046,475 on housing schemes. The annual expenditure on the repaving and maintenance of existing roadways, streets, and widening schemes has been approximately £140,000. The city markets have been rebuilt, libraries established, a large electricity supply plant installed, an adequate supply of water provided by two reservoirs

of 3,700,000,000 gallons capacity situated at Roundwood about 25 miles from the city, and a great system of main drainage completed. The port also has been very active. In 1927 the number of vessels engaged in foreign trade that entered the port was 5535 with a tonnage of 2,230,166, the number of vessels cleared was 5612 with a tonnage of 2,269,339. A deep-water quay, with berthage of 35 feet at low water, has been built for the accommodation of large overseas vessels. Since the War many thousands of workmen's dwellings, mostly of the cottage-garden type, have been constructed.

**DUBLIN, LOUIS I (SRAEL)** (1882- ). An American statistician, born in Kovno, Lithuania, and educated at the College of the City of New York and Columbia University (Ph.D., 1904). As statistician of the Metropolitan Life Insurance Company (1911- ), he carried out important researches upon problems of vital statistics and public health and published the results in several books and monographs. In July, 1929, he was named chairman of the executive committee to assist the Department of Commerce in making the population census of 1930.

**DUBOIS, du'bwá', CHARLES GILBERT** (1870- ). American banker and business man, born in New York City, and educated at Dartmouth. Upon leaving college, he entered business with the Western Electric Company in New York and within a little over a decade became secretary and supervisor of the company's branch houses. He was president (1919-26) and chairman of the board (1926-27), and also was comptroller of the American Telephone and Telegraph Company (1907-18) and of the American Red Cross, Washington, D. C. (1917-18). He has held the presidency or directorship of many leading trust companies and banking corporations in the United States.

**DUBOIS, EUGENE FLOYD** (1882- ). An American physician, born at West New Brighton, N. Y. He received the degrees of A.B. from Harvard (1903) and M.D. from Columbia (1906). From 1910 to 1917, he taught applied pharmacology in the Cornell Medical School and was later made associate professor of medicine. In 1913 he became director of the Russell Sage Institute of Pathology and in 1919 director and visiting physician of Bellevue Hospital. He is also in charge of the research division of the Bureau of Medicine and Surgery of the U. S. Navy, in which connection he has carried out investigations into the use of airplanes, submarines, and gas in warfare. His chief publication is *Basal Metabolism in Health and Disease* (1924). He has made various studies under the head of anthropology.

**DUBOIS, LOUIS ERNEST, CARDINAL** (1856-1929). A French prelate who was born at Saint. Calais, Sarthe, and ordained priest in 1879. He was curate at Saint-Benoît du Mans in 1895, and passed rapidly through the various grades of the Catholic hierarchy. He was Bishop of Verdun in 1901, Archbishop of Bourges in 1909, Archbishop of Rouen in 1916, and Archbishop of Paris in 1920. He became Cardinal in 1916. Cardinal Dubois was a Knight of the Holy Sepulchre and a member of the Academy of St. Thomas Aquinas. His writings included a number of biographies and historical chronicles.

**DU BOIS, WILLIAM EDWARD BURGHAEDT** (1868- ). An American editor and author of Negro descent born at Great Barrington, Mass., and educated at Harvard and the Uni-

versity of Berlin. During the period 1896-1910, he was professor of economics and history at Atlanta University, and since 1910 has been editor of the *Crisis*. He has given indication of his keen interest in the advancement of the Negro, in his writings: *The Suppression of the Slave Trade* (1896); *The Philadelphia Negro* (1899); *Quest of the Silver Fleece* (1911); *The Black Folk* (1924), and *The Dark Princess* (1928). He edited the *Atlanta University Studies of the Negro Problem* (1897-1911).

**DU BOSE, HORACE MELLARD** (1858- ). A bishop of the Methodist Episcopal Church, South, born in Choctaw County, Ala., and educated at Waynesboro Academy, Mississippi, and by private tutors. He was licensed to preach in the Methodist Episcopal Church in 1876, and three years later was ordained. He was a member of the Mississippi Conference from 1877 to 1880, and held various pastorates from 1881 to 1890. From 1890 to 1894, he was editor of the *Pacific Methodist Advocate* in San Francisco; served in various pastorates for the next three years, and became secretary of the Epworth League and editor of the *Epworth Era* in 1898. From 1910 to 1915, he was again pastor, and from 1915 to 1918 was book editor for the Methodist Episcopal Church of the South, and editor of the *Methodist Quarterly Review* in Nashville. He was elected bishop in 1918, being stationed at Berkeley, Calif. He was a member of the Ecumenical Conferences which took place in 1901 and 1911. He was author of a number of religious books and pamphlets and edited the *Aftermath Series*, a symposium of reviews of problems in Biblical criticism (12 volumes, 1923).

**DU GARD, ROGER MARTIN.** See MARTIN DU GARD, ROGER.

**DUGGAN, STEPHEN PIERCE** (1870- ). An American author and political scientist, born in New York City and educated at the College of the City of New York and Columbia University. He was associate professor and professor of political science at the College of the City of New York (1896-1928); and director of the Institute of International Education (1919- ), the National Commission for Mental Hygiene, and the Council on Foreign Relations. He was lecturer on international relations at Columbia, 1924-25, and has been secretary of the American University Union in Europe since 1926. He was a member of the Philippine Educational Survey Commission (1925) and of the Institute of Pacific Relations (1927). He published *The Eastern Question—A Study in Diplomacy* (1902), *A History of Education* (1916), and *The League of Nations* (1919).

**DUGGAR, BENJAMIN MINGE** (1872- ). American educator (see VOL. VII). He was research professor of plant physiology at Missouri Botanical Garden and Washington University from 1912 to 1927 when he became professor of physiological and economic botany at the University of Wisconsin. He edited the department of physiology in *Botanical Abstracts*, 1917-26, and for *Biological Abstracts* since 1926. Professor Duggar wrote *Mushroom Growing* (1915), and contributed many articles to botanical magazines.

**DUGUIT, dū-gé, PIERRE (MARIE NICOLAS) LÉON** (1859- ). A French jurist, born at Libourne, and educated at the college there and the law faculty of the University of Bordeaux. He remained in the university as a member of the faculty, becoming its dean, and achieved an

international reputation as a sociological jurist. He was the author of *Études de droit public; L'état, les gouvernants, et les agents; manuel de droit constitutionnel* (2 ed., 1911); *Traité de droit constitutionnel* (2 vols., 1911, 3 vols., 2d. ed., 1921-23); *Les transformations du droit public*, translated as *Law in the Modern State*, by Frida and Harold Laski in 1919 (1913), and *Souveraineté et liberté*, lectures given at Columbia University (1922). He and H. Monnier edited *Les constitutions et les principales lois politiques de la France depuis 1789* (1898, 4th ed., 1925).

**DUHAMEL, du'ā'mēl', GEORGES** (1884- ). The pseudonym of Denis Thévenin, a French writer who was born in Paris. He became a doctor, but gave up that profession for literature, and, with Jules Romains and Charles Vildrac, represented what has been called the "unanimist" movement, which implied an all-pervading sympathy and participation in the "collective consciousness" of the sociologists. During the World War, he was mobilized as an assistant physician, and his descriptions of what he saw, in *La vie des martyrs* (1917) and *Civilisation* (1918), Prix Goncourt for 1919, brought him into the front ranks of the writers of his day. In 1928 he published *Les sept dernières plaies*, which, with the above books, formed a trilogy. His other works include: *L'homme en tête*, poetry (1909); *Selon ma loi*, poems (1910); *La lumière*, drama (1911); *Propos critiques* (1912); *Compagnons*, poems (1912); *Dans l'ombre des statues*, a play (1912); *Paul Claudel* (1913); *Le combat*, a play (1913); *Les poètes et la poésie, 1912-1914*; *La recherche de la grâce* (1918); *La possession du monde* (1919); *La pointe et Kopteau*, a comedy (1919); *Entretiens dans le tumulte* (1919); *Élégies* (1920); *Confession de minuit* (1920); *L'œuvre des athlètes*, a play given at the Vieux Colombier (1920); *Les hommes abandonnés* (1921); *Lettres d'Auspaste*, essays (1922); *La journée des aveux*, a play produced at the Champs-Élysées, and *Quand vous voudrez* (1924); *Deux hommes* (1924); *Essai sur le roman* (1925); *Lettres au Patagon*, essays (1926); *La pierre d'Horeb* (1926); *Les plaisirs et les jeux* (1926); *Maurice de Vlaminck* (1927); *La nuit d'orage* (1928); and *Le voyage de Moscou* (1928). Many of the books were translated into English. Consult *Georges Duhamel*, by Luc Durtain (1920), *Les ouvrages de Georges Duhamel*, a bibliography, by Claude Aveline (1925), and *Georges Duhamel*, by many authors in the series *Écrivains et poètes d'aujourd'hui* (1927).

**DUKAS, PAUL** (1865- ). A distinguished French composer, born in Paris. He studied at the Conservatoire under Mathias, Dubois, and Guirand, taught orchestration there from 1909-12, and then was appointed member on the committee of studies. In 1926 he was appointed professor of composition at the École Normale de Musique in Paris, and in 1928 was elected Widor's successor as director of the Conservatoire. His most famous work is an orchestral scherzo, *L'Apprenti Sorcier*. His opera *Ariane et Barbe Bleue* (Paris 1907) quickly made its way to the principal opera houses of Germany, Austria (1908), Italy (1909), and New York (1911). Besides, he wrote two ballets, *La Péri* (Paris, 1911) and *Fantaisie chorégraphique* (Paris, 1928); a symphony in C; three overtures, *King Lear*; *Götter von Beröckungen* and *Polyeidos*; and some fine piano pieces. Together

with Saint-Saëns, he completed and orchestrated Guiraud's opera, *Frédégonde* (Paris, 1805).

**DUKE, JAMES BUCHANAN** (1857-1925). An American tobacco manufacturer and founder of Duke University (see Vol. VII). He served as president of the American Tobacco Company, which he had organized, until 1912. In 1922 he gave \$1,000,000 for the endowment fund of Trinity College at Durham, N. C., and \$25,000 for a memorial gymnasium. Two years later he placed securities valued at \$40,000,000 in a trust fund to be administered by a board of trustees for educational and philanthropic purposes in North and South Carolina. This trust provided for the establishment in North Carolina of Duke University (q.v.). Trinity College was then expanded into Duke University to meet the conditions of the gift, and Mr. Duke's will greatly increased the available funds for the institution.

**DUKES, ASHLEY** (1885- ). A British author and dramatist who was educated at Silcoates School, and Manchester and Munich universities. From 1909 to 1925, with the exception of the four years which he spent on active service during the World War, he was dramatic critic for various papers. Besides translations of German plays and poems, he wrote *Modern Dramatists*, a criticism and sketch of the lives of some of them (1911); *The Youngest Drama*, more studies (1923); *The Man with a Load of Mischievous*, a romantic comedy of the past, written in beautiful prose (1924), and produced in London in 1925; *The Song of Drums*, a heroic comedy about Tyl Ulenspiegel (1926); *Drama*, historical and critical essays (1926); *One More River*, a comedy (1927); *Remembrance is a Flower*, a play (1927); *The Fountain Head* (1928), and *The World to Play With* (1928).

**DUKE UNIVERSITY.** An institution for higher education at Durham, N. C., which was established in 1924 by the expansion of Trinity College, made possible through benefactions from James B. Duke, who, in 1924, executed an indenture setting aside \$40,000,000 for educational and charitable purposes, \$6,000,000 of the fund for the erection of buildings at Duke University, while 32 per cent of the income was to go to the University beginning in 1926. Later, he gave \$2,000,000 to be applied to the building fund and after his death in 1925 by his will there was added \$10,000,000 of which \$4,000,000 was for medical-school buildings. An additional \$7,000,000 was given to the building fund making a total for buildings of \$19,000,000. Under the will of the founder, Duke University is to receive 10 per cent of the residuary estate. For the new construction more than 4000 acres of land adjoining the old Trinity College campus was purchased. Eleven new buildings, including a library, a union hall for recreational and student activities, a chapel, five dormitories, a class-room building, a science hall, and a faculty apartment house are now completed and occupied. Work is progressing satisfactorily on the large group of more than forty buildings which will comprise the complete plan for the University, all of which will be built of native North Carolina stone of Cambrian formation, taken from a quarry owned by the university. Total university endowment in 1928 amounted to \$20,785,207.05. The library contains 108,865 books. The Angier B. Duke Memorial Loan Fund for students exceeds \$500,000. Enrollment in the autumn of 1928 was 1806, of which

1576 were undergraduates. There were 62 students in the graduate school of religion and 168 were enrolled in other graduate departments. The faculty and administrative staff numbered 235 in 1928. An attendance of 1484 was recorded during the summer session of the same year. President, William Preston Few, LL.D.

**DULUTH.** A city and lake port in Minnesota. The population rose from 78,466 in 1910 to 98,917 in 1920, and to 116,800 in 1928, by estimate of the Bureau of the Census. Duluth ranks second, in comparison with the principal ports of the United States, based on total freight tonnage arriving and departing, being surpassed only by New York. The harbor area is 19 square miles and the harbor frontage 40 lineal miles. There are 49 wharves handling freight other than iron ore, coal, and grain, 22 coal docks, 9 iron-ore docks, 27 grain elevators, 10 railroads serving the port, and 52 steamship lines. The facilities for handling ore, coal, and grain are probably not surpassed by any other port. In anticipation of even greater activity on the inland waters with the completion of the Great Lakes-St. Lawrence Waterway Project and the consequent development of industry and commerce throughout the central-northwestern group of States, a joint port commission has been appointed for the Duluth-Superior Harbor. This commission, consisting of six members, three of whom were from the city of Superior and three from Duluth, will conduct a study of the present facilities and services offered to shipping. It also will initiate such additional measures as seem advisable to provide the most ideal conditions for the service of ocean carriers and such other commerce as may be induced to seek inland distribution. This commission was appointed by the Governors of Minnesota and Wisconsin under the authority of the State Legislatures.

Duluth has a widely diversified line of manufactures, including iron and steel, wood, woolen, grain, cement, and dairy products. Morgan Park, a model city for workmen, was built between 1914 and 1924 by the Minnesota Steel Company, the largest single manufacturing industry, for its employees within the limits of Duluth. Duluth has 83.92 miles of street railway, 225.71 miles of sewers, 127.94 miles of paved streets, 39 miles of boulevard drive, 12 playgrounds, four athletic fields, and 75 parks. In 1927 a new municipal building was erected at a cost of \$750,000. In 1926 a toll bridge with a movable span affording a clear channel width of 227 feet was erected between the cities of Duluth, Minn., and Superior, Wis. The value of 2520 building permits which were issued in 1927 was \$4,494,388. The assessed valuation of property in Duluth, according to 1927 statistics, was \$133,728,000; the net debt amounted to \$12,342,000. In 1928 bank clearings amounted to \$439,673,000.

**DUMAS, du'mâ', GEORGES** (1806- ). A French psychologist, born at Lédignan (Dept. of Gard), and educated in Paris at the École Normale Supérieure. He passed both the *agrégation* and the doctorate in philosophy, and took the degree of doctor of medicine. He taught philosophy at the college of Chaptal and later became lecturer on psychology at the Sorbonne, as well as chief of the psychological laboratory at the clinic for mental maladies in the Faculty of Medicine. He was a frequent contributor to the *Journal de Psychologie*, the *Revue Philoso-*

phique, and the *Revue de Paris*. On the death of Ribot, he took over the editing of the long projected *Traité de Psychologie*. The first volume of this treatise, with contributions from 30 leading psychologists, appeared in 1923, and the second in 1924. Professor Dumas's chief interests were in the psychology of affective states. His published works include: *Tolstoi et la philosophie de l'amour*; *Les Etats intellectuels dans la mélancolie*; *La Tristesse et la joie*; *Psychologie de deux Messies positivistes* (August Comte et St. Simon); *Le Sourire*; *Névrose et psychose de guerre chez les Austro-Allemands* (1918), and *Troubles mentaux et troubles nerveux de guerre* (1919). He edited *Les questions du temps présent*; *études de culture générale*.

**DU MAURIER**, du mō'ryā', SIR GERALD (1873- ). An English actor and manager born at Hampstead, and educated at Harrow. His first stage appearance was at the age of 20 at the Garrick Theatre, London. Two years later, he joined Herbert Tree in Shakespearean repertory and also in his father's play *Trilby*. Among his successes are his parts in *Peter Pan*; *The Admirable Crichton*; *Little Mary*; *What Every Woman Knows*, and his leading parts in Conan Doyle's *Raffles* and McCutcheon's *Brewster's Millions*. He wrote the play, *A Royal Rival*, produced by Lewis Waller; also *Charles I* and *Charles II*, with the cooperation of his brother, Guy Louis Busson du Maurier, and *The Dancers* which was produced in New York in 1923-24. He was knighted in 1922. In 1928 he played Dr. Faustus in Arnold Bennett's *The Return Journey*.

**DUMUR**, du'mōōr', LOUIS (1864- ). A French novelist, born at Geneva, Switzerland, and educated at the university there and at the Sorbonne, Paris. His earlier works contained amusing descriptions of Genevese Calvinism. His works include *Un Coco de génie* (1902); *Les trois Demoiselles du père Marie* (1909); *Le Centenaire de Jean-Jacques* (1910); *L'École du dimanche* (1911); *Les deux Suisses, 1914-17* (1917); *Nach Paris!* (1919); *Le Boucher de Verdun*, being the German Crown Prince (1921); *Les défaits* (1923); *La croix rouge et la croix blanche; ou, La guerre chez les neutres* (1925); and *Dieu protège le Tsar*, about Rasputin (1928).

**DUNCAN**, GEORGE BRAND (1861- ). An American soldier, born in Lexington, Ky. Graduated from the United States Military Academy in 1886, he was commissioned 2d lieutenant, served as captain of volunteers during the Spanish-American War, and was appointed captain in 1899, colonel in 1916, brigadier general N. A., 1917, major general in 1918, and brigadier general, U. S. A., in 1920. He served in the Philippines as a member of the General Staff from 1914 to 1917. From the latter year to 1919, he was with the American Expeditionary Forces in France as commander successively of the 26th Infantry, 1st Division, and the 1st Brigade, 1st Division. He commanded the 77th Division from May to August, 1918, and the 82d Division during the Meuse-Argonne offensive. He was awarded decorations by the British and French governments and the Distinguished Service Medal of the United States. In 1922 he was promoted to major general, U. S. A. He commanded the Seventh Corps Area (Omaha), 1922-25, and was retired in 1925.

**DUNHAM**, JAMES HENRY (1870- ). An American clergyman and educator, born at Bed-

minster, N. J., and educated at Princeton University, Princeton Theological Seminary, the University of Berlin, and the University of Pennsylvania. He was ordained in the Presbyterian ministry in 1896, and until 1912 was pastor of the First Church at Mt. Holly. In 1914 he began his work as educator, teaching in the Haverford (Pa.) School and holding the position of professor of ethics in the College of Liberal Arts and Sciences at Temple University, Philadelphia, in 1914-15. Since 1915 he has been professor of philosophy and dean of the college. He is the author of *Freedom and Purpose—The Psychology of Spinoza* (1916); and *John Fourteen* (1917).

**DUNKERS**. See BRETHREN, CHURCH OF THE.

**DUNLAP**, KNIGHT (1875- ). One of the leading American experimental psychologists. He was born at Diamond Spring, Calif., and educated at the University of California. In 1906 he joined the faculty of Johns Hopkins University, becoming full professor in 1916. He is managing editor of the *Journal of Comparative Psychology* and editor of *Psychology Classics*. His works include: *A System of Psychology* (1912); *Outline of Psycho-biology* (1914); *Personal Beauty and Racial Betterment* (1920); *Mysticism, Freudianism, and Scientific Psychology* (1920); *Elements of Scientific Psychology* (1922); *Social Psychology* (1925); *Old and New Viewpoints in Psychology* (1925).

**DUNN**, ARTHUR WILLIAM (1868-1927). An American educator, born at Galesburg, Ill., and educated at Knox College and the University of Chicago. He began his career as instructor in English and lecturer in sociology at the University of Cincinnati (1896-98). He headed the department of history and civics in the Shortridge High School, Indianapolis, 1900-10. In 1910-11, he was civic secretary of the City Club of Philadelphia; in 1911-14, executive secretary of the Public Education Association, New York City; and from 1914 to 1921, was specialist in civic education in the United States Bureau of Education. In 1920 he became associate national director of the Junior Red Cross, and was advanced to the position of national director in 1921. He was the author of: *The Community and the Citizen* (1907); *The Teaching of Community Civics* (with others; 1915); *Social Studies in Secondary Education* (1916); *Citizenship in Secondary Education* (1916); *Citizenship in School and Out* (with Hannah Margaret Norris; 1920); *Community Civics and Rural Life* (1920); *Community Civics for City Schools* (1921).

**DUNN**, GANO (1870- ). An American electrical engineer (see Vol. VII). He was a member of the War Department Nitrate Commission in 1916-18 and chairman of the State Department special committee on submarine cables in 1918. He also served as one of the U. S. delegates to the Third Pan-American Commercial Conference in Washington in 1927.

**DUNN**, SAMUEL ORACE (1877- ). An American transportation specialist (see Vol. VII). He wrote *American Transportation Question* (1912); *Government Ownership of Railways* (1913); *Railway Regulation or Ownership?* (1918). He also contributed articles to periodicals and lectured frequently on transportation subjects.

**DUNNING**, WILLIAM ARCHIBALD (1858-1922). An American educator and historian (see Vol. VII). He published *The British Em-*

pire and the United States (1914), and a *History of Political Theories* (3 vols., 1902-20).

**DUNSANY**, dūn-sā'-nā, EDWARD JOHN MORETON DRAX PLUNKETT, EIGHTEENTH BARON (1878- ). An Irish author and playwright, born in London and educated at Eton and Sandhurst. He served in the South African War with the Coldstream Guards. In the World War, he was Captain of the Royal Inniskilling Fusiliers. Many of Dunsany's works are laid in the Golden Age of Spain and are saturated with the romantic spirit of mediæval gloom and colored adventure.

His publications include: *The Gods of Pegana* (1905); *Time and the Gods* (1906); *The Sword of Welleran* (1908); *A Dreamer's Tales* (1910); *Tales of War* (1918); *Unhappy Far-off Things* (1919); *Tales of Three Hemispheres* (1920); *The Chronicles of Rodriguez* (1922); *The King of Elfland's Daughter* (1924); *The Charwoman's Shadow* (1926); *Number Six Joy Street* (with Walter De La Mare and others), stories for boys and girls (1928) and *The Blessing of Pan* (1928). Among his plays are: *The Glittering Gate* (1909); *King Argimenes* (1911); *The Gods of the Mountain* (1911); *The Golden Doom* (1912); *The Tents of the Arabs* (1914); *A Night at an Inn* (1916); *If* (1921); *Plays of Near and Far* (1922); *Alexander and Three Small Plays* (1925).

**DU PONT**, THOMAS COLEMAN (1863- ). A United States Senator and member of the well-known Delaware family, who was born at Louisville, Ky., and studied at the Massachusetts Institute of Technology. After his twenty-first year he was engaged in coal and iron mining in Kentucky and in the operation of street railways. Removing to Wilmington, Del., in 1900, he became president of the E. I. DuPont de Nemours Powder Company (1902-15). In 1908 he became a member of the Republican National Committee. He was appointed a member of the U. S. Senate to fill a vacancy (1921-22) and was elected for the term 1925-31, but because of continued ill health resigned his Senate seat in December, 1928.

**DUPRÉ**, MARCEL (1886- ). A famous French organist, born at Rouen. Under his father's instruction, his progress was so rapid that, at the age of 12, he became the regular organist at St. Vivien. Later, he entered the Paris Conservatoire, where he carried off the first prize for piano in 1905. In 1914 he won the Prix de Rome with the cantata *Psyché*. His meteoric rise to fame began in 1916, when he took Vierne's place at Notre Dame during the latter's protracted illness. In 1920 he created a sensation by playing from memory, in 10 recitals, all the organ works of Bach. Immediately after that event, he made a sensation tour of England. On Nov. 18, 1921, he made his American début with the inauguration of the great organ in the Wanamaker Auditorium in New York, exhibiting at the same time his marvelous powers of improvisation. He was made Chevalier of the Legion of Honor in 1923.

**DURALUMIN**. An alloy of aluminum and magnesium. See ALUMINUM; MOTOR VEHICLES.

**DURAND**, EDWARD DANA (1871- ). An American statistician (see VOL. VII). He was employed by the United States Food Administration from 1917 to 1919, and was adviser to the food minister of Poland from 1919 to 1921. He was chief of the Eastern European Division of the United States Bureau of Foreign and

Domestic Commerce, 1921-24. Since 1924 he has been chief of the Division of Statistical Research, Department of Commerce and editor of the *Statistical Abstract of the U. S. and Commerce Year book*. He contributed articles on economic and political subjects to many economic journals, and in 1915 published *The Trust Problem*.

**DURANT**, WILLIAM JAMES (1885- ). An American philosopher and author, born at North Adams, Mass., who was graduated at St. Peter's College, Jersey City, N. J., in 1907. For four years, after graduation, he held a professorship of Latin and French at Seton Hall College, South Orange, N. J. While directing the Labor Temple School in New York City (1914-27) he obtained the degree of Ph.D. at Columbia. He is author of *Philosophy and the Social Problem* (1917); *The Story of Philosophy* (1926); *Transition* (1927); and *The Mansions of Philosophy* (1929).

**DURHAM**, HENRY WELLES (1874- ). An American civil engineer, born in Chicago. He graduated from the School of Mines at Columbia University in 1895, and was engaged on surveys with the United States Geological Survey, and with the United States Nicaragua Canal Commission and with the Isthmian Canal Commission. From 1900 to 1904, he was assistant engineer in charge of construction of the New York subway, and was resident engineer in charge of municipal improvements in Panama, from 1904 to 1907. From the latter date to 1912, he was in charge of the surveys and construction of the Cape Cod Canal, and from 1912 to 1915 was chief engineer of highways for Manhattan Borough. He was a member of the New York National Guard and served on the Mexican border in 1916. He was appointed major of engineers in 1917 and was given command of the 41st Engineers, which he commanded in France. For a time, he was in charge of forestry operations in France and later was in charge of road maintenance. He was honorably discharged in October, 1919. In 1920-22 he was engaged in making plans for the sanitation of several cities in Peru. Since 1924 he has been in charge of sanitation and paving at Managua, Nicaragua. He wrote *Street Paving and Maintenance in European Cities* (1915).

**DURKHEIM**, dur'-kân', EMILE (1858-1917). A French philosopher (see VOL. VII). He published a number of brochures on the World War and was honored by the French government with the cross of the Legion of Honor. His later works were *La Sociologie* (1915), *Education et sociologie*, essay (1922), and *Sociologie et philosophie* (1924). The sociological method of approaching philosophic problems, which he founded, was continued by a host of disciples, among whom may be mentioned Bouglé, Hubert, and Mauss.

**DURTAIN**, dur'-tân', LUC (1881- ). A French author whose works include the "Conquêtes du Monde" series: *L'Étape nécessaire*; *Deux Cent Mille* (1922); *La Source Rouge*; *Ma Kimbell* (1925), and *Amérique* in two volumes, *Quarantième Étage*, three short stories (8 ed., 1927) and *Hollywood dépassé*, a novel (1928), both the result of his visit to the United States. He also wrote *Manuscrit trouvé dans une île* (1913); *Georges Duhamel*, a critical study (1920); *Face à Face*; *ou, Le Poète et toi* (1921); *L'Autre Europe: Moscou et sa foi*, an account



of his trip to Russia (1928), and a drama, *Le Donneur de sang*, played at the Odéon (1928). His volumes of poetry were *Pégase* (1908); *Kong Harald* (1914); *Lise* (1918); *Le Retour des hommes* (1920), and *Perspectives*.

**DUSE**, *doo'zà*, ELEONORA (1859-1924). An Italian actress (see VOL. VII). The World War depleted her fortune, so in spite of poor health she was forced to appear on the stage again. While on an American tour, she became seriously ill with a cold and general nervous breakdown, and died at Pittsburgh, Apr. 21, 1924. Her last appearance at the Metropolitan Opera House in New York was an ovation, every seat and all the standing room being occupied.

**DUSSAP**, *Mme*. EDGAR. See CHANTEPLEURE, GUY.

**DUTCH EAST INDIES** (NETHERLANDS INDIA). The Dutch possessions in the Malay Archipelago. They have a total area of 733,640 square miles, and a population, by the census of 1920, of 49,350,834. The 1905 census figure was 38,070,782. In 1926 the population was estimated at 51,717,688. In 1920 there were 169,355 Europeans, 48,112,706 natives, and 878,986 other Orientals, mostly Chinese and Arabs. By administrative divisions, the 1920 population was divided among Java and Madura (34,984,171), and the Outer Possessions, i. e., the Island of Sumatra (5,852,135), Riau-Lingga Archipelago (223,122), Banca (154,141), Billiton (68,582), Borneo, West Coast (605,402), Borneo, South and East Districts (1,020,599), Island of Celebes (3,108,337), Molucca Islands (622,671), Timor Archipelago (1,146,660), Bali and Lombok (1,565,014). New Guinea was included. Populations of the leading cities in 1920 were Batavia, 2,787,000; Soerabaya, 2,460,000; Semarang, 2,737,000. The great mass of the natives were Mohammedan in faith. Education made steady advances. In 1927 there were 605 public and private schools serving Europeans and people associated with them. Total attendance was 121,499, and expenditure on education amounted to 14,276,000 guilders, a guilder equaling \$0.40. There were also 16,789 native schools, with an attendance of 1,283,271, maintained at a cost of 29,540,900 guilders.

**Industry.** The majority of the population works on the land. Java and Madura, which account for a great part of the entire agricultural industry, had, in 1926, 18,106,000 acres under native culture or about 55 per cent of their total area; 1,523,000 acres were cultivated in plantations operated by Europeans, who hold most of the land leases in Java. Sugar remains the crop of greatest economic importance, and in 1926, 178 factories were serving the industry. The following table indicates the condition of native activities before and after the War as shown in exports, in metric tons:

	1918	1918	1921	1926
Sugar	1,471,428	1,540,100	1,677,187	1,741,050
Coffee	26,019	7,300	43,683	74,085
Tea	26,548	29,958	35,863	71,350
Tobacco	87,832	8,050	46,214	74,485
Rubber	7,087	44,096	73,505	269,399
Copra	229,339	68,578	311,571	415,441
Tin	2,153	11,584	13,547	18,345

Native cultures are rice, maize, cassava, potatoes, coconuts. The live stock industry also is flourishing. The government largely controlled the mines. In 1926 the principal coal mines in Java, Sumatra, and Borneo yielded 1,460,359

tons; the tin mines yielded 32,607 tons; and the principal mineral oils, 21,242,000 barrels. The oil fields are controlled by the Royal Dutch and Shell Companies. Gold is worked in Sumatra and diamonds, in Borneo.

**Trade.** Total imports, both government and private, exclusive of specie, for the years 1913, 1921, and 1926 were 463,702,000, 1,192,963,000, and 855,731,000 guilders. Exports, similarly, for 1913, 1921, and 1926 were 671,434,000, 1,190,799,000, and 1,592,409,000 guilders. The Dutch East Indies' great importance as a market for manufactured goods and a source of raw materials is being recognized by foreign commercial houses. In particular, British, Japanese, Swedish, Belgian, Danish, and German interests are active. Imports from the United States for 1913, 1920, and 1925 were valued at \$3,358,164, \$50,018,190, and \$21,442,000. Exports to the United States were valued at \$4,995,150, \$167,416,000, and \$100,961,000. In 1928 exports to the United States from Java and Madura were valued at \$53,900,793 and from other portions at \$32,251,203. In that year United States imports to Java and Madura were \$25,400,479 and to other Dutch East Indies, \$9,035,224. Shipping entered in 1913 was 6253 steamers of 5,046,000 tons and 2664 sailing vessels of 192,000 tons; in 1926, 11,506 steamers of 8,694,206 tons and 8940 sailing vessels of 526,890 tons. Chief ports are Tanjong Priok (for Batavia), Soerabaya, Semarang, Cheribon, and Tegal in Java; Padang and Belwan Deli in Sumatra; Balikpapan in Borneo, Macassar in Celebes.

**Communications.** In December, 1926, there were 3870 miles of railway both state owned and private; 1721 miles in 1913. Of the former, 2930 were in Java and 915 in Sumatra. Government telegraph and cable lines were 14,150 miles, compared with 12,319 in 1913.

**Government.** Superior administration is in the hands of the governor general. A council of five with power of a legislative and advisory nature sat for the whole territory. In 1917 a Volksraad, or people's council, was erected, with powers to discuss the budget and advise the Government. Made up of some 40 members, it included Europeans, natives, and foreign Orientals. Further extensions of home rule were granted in 1925. The 1913 and 1928 budgets showed revenues of 305,573,000 and 747,194,826 guilders and expenditures of 317,810,000 and 798,110,550 guilders. Deficits were covered by loans. The public debt on Dec. 31, 1927, was 1,056,000,000 guilders (\$422,000,000). Extraordinary expenditures went toward the improvement of the Outer Possessions and the encouragement of industries. Revenues came largely from sales of opium in India, import, export, and excise duties, land revenues, coal, and income taxes. The Dutch East Indies continued peaceful during and after the War and Dutch neutrality assured the colony an unchecked prosperity. Progress was steady in the development of the Outer Possessions. Late in 1926, several uprisings occurred in the islands, particularly in Java. The Government suppressed them and claimed that they were the result of Communistic propaganda.

**DUTCH GUIANA.** See GUIANA.

**DUTCH NATIONALISTS.** See SOUTH AFRICA, UNION OF.

**DUTCH REFORMED CHURCH.** See REFORMED CHURCH IN AMERICA.

**DUVENECK, FRANK** (1848-1919). An American painter, sculptor, and etcher (see Vol. VII). Known as one of the finest technical painters of the United States, he was an active figure in American and English art circles. During his later years, after a long period of study and of teaching in Florence, he served as instructor in the Art Academy of Cincinnati. His "Whistling Boy," reminiscent of Hals, and "Forget-me-not Girl," after the manner of Rembrandt, also his "Portrait of Professor Loeffts," were generally held to be his finest works.

**DVORSKY, MICHEL.** See **HOFMANN, JOSEF.**

**DYER, WALTER ALDEN** (1878- ). An American author and journalist, born at Roslindale, Mass., and educated at Amherst College. He began on the staff of the *Springfield Union* (Mass.) in 1901, and for the next six years edited various publications, subsequently becoming managing editor of *Country Life in America* (1906-14). He has contributed many

articles to magazines, and has written *The Lure of the Antique* (1910); *The Richer Life* (1911); *Pierrot, Dog of Belgium* (1915); *Creators of Decorative Styles* (1917); *Handbook of Furniture Styles* (1918); *Sons of Liberty* (1920); *Many Dogs There Be* (1924); *All Around Robin Hood's Barn* (1926); *The Breakwater* (1927); *Country Cousins* (1927); and *Chronicles of a Countryman* (1928).

**DYER, SIR WILLIAM TURNER THISELTON** (1843-1929). An English botanist (see Vol. VII). From 1908 to 1916, he was representative of the University of Oxford at the Gloucestershire Education Committee, and from 1909 was a member of the University of Bristol.

**DYES.** See **CHEMISTRY, APPLIED.**

**DYNAMIC GEOLOGY.** See **GEOLOGY.**

**DYNAMO ELECTRIC MACHINERY.** See **ELECTRIC POWER STATIONS AND GENERATING APPARATUS.**

**DYNAMOS.** See **ELECTRIC POWER STATIONS AND GENERATING APPARATUS.**

**ARLHAM COLLEGE.** A coeducational institution at Richmond, Ind., founded in 1859. The student enrollment increased from 413 in 1914 to 469 for 1927-28; and the faculty from 32 to 38 members. The number of volumes in the library was increased from 19,000 in 1914, to 35,900 in 1928; and yearly income increased from \$25,118 in 1914, to \$270,825 for the year 1927-28, while productive funds of the college in 1928 amounted to \$1,237,235. Carpenter Hall, a new administration and class-room building, was completed for occupancy in 1927. President, David M. Edwards, Ph.D.

**EARTH, AGE OF, EARTH STRUCTURE, ETC.** See GEOLOGY; PHYSICS.

**EARTH INDUCTION COMPASS.** See NAVIGATION.

**EARTHQUAKES.** About noon on Sept. 1, 1923, Tokyo, Yokohama, Nagoya, and many villages and pleasure resorts of Japan were almost entirely wiped out, in the greatest earthquake disaster of history. Earthquake, fire, and sea-wave took a toll of 99,331 killed, 43,476 missing, and 103,733 injured, over an area of about one square degree, dwarfing into insignificance each on the long list of similar disasters in the past for which Japan, one of the most seismic regions of the globe, is noted.

The Japanese Islands lie in a series of island festoons fringing the Asiatic Continent, with their convexities facing the Pacific. Outside these festoons, and not far from them, are long narrow troughs in the sea floor, running parallel to the trend of the island groups. The troughs are the downward, and the island festoons the upward, curves of great folds in the crust of the earth; in many cases, the folding movement is still going on. Stresses accumulate until suddenly relieved by faulting. The convex side of the festoon slopes more steeply than the other. The Japan Sea to the West is shallow, but on the Pacific side, between the Japan coast and the Kurile Islands, the earth's crust in one place plunges down into the great Tuscarora Deep nearly 27,000 feet, within 110 to 240 miles of the coast. The earthquakes of Japan follow a rule which is general in such cases: they are most numerous and violent on this steep slope. The epicentre of the 1923 quake appears to have been under Sagami Bay, the floor of which underwent great changes; the focus was probably about 50 kilometers (31.07 miles) deep. This was the first destructive quake to originate in the region since 1703.

The first and greatest shock came at 11.58.44 A.M.; there were no foreshocks to give warning. An unusually large number of aftershocks were recorded, 1039 in the five days following the quake, implying that the faulting movement had a pronounced vertical component. The greatest aftershocks were those on Sept. 2, 1923, and Jan. 14 and August 13-15, 1924. In Tokyo, 12 square miles were swept by the fire that followed the quake. Modern reinforced concrete structures especially designed to withstand earth-

quakes came through with a fine showing; the better constructed brick buildings also survived both quake and fire, although in general the brick buildings proved unusually dangerous. From 1914 to 1921, 199 earthquakes, some semi-destructive, originated around Tokyo, but the immediate neighborhood of Tokyo was quiet. This fact led Omori to forecast a commencement of seismic activity in the latter district after the others had become quiet, since they were all in the same seismic zone; in 1922 he predicted the occurrence of severe shocks within six years. See JAPAN.

An earthquake of truly appalling magnitude took place on Dec. 16, 1920, near Pingliang, Kansu, China. The region was thickly populated; many of the people lived in caves in the hillsides, and were buried alive by the landslides; others slept on clay platforms under which fires were kept burning, and such of these as escaped being dropped into the fires were left to die of the cold. The estimates of deaths vary from 100,000 to 1,000,000. The tremor was felt in Tokyo, 1000 kilometers away. On May 23, 1927, another quake occurred with an epicentre 130 miles farther west, in which 10,000 were killed.

In the disastrous shock in Central Italy, Jan. 13, 1915, the ratio of deaths to population was the highest ever recorded. Thirty thousand people perished, including 97 per cent. of the population of Lapelle, and 90 per cent. of the 11,000 inhabitants of Avezzano. Yet the shock was by no means of the first order of magnitude, and the destruction was chiefly due to the faulty construction of buildings. A strong tectonic quake, registered all over the globe, was associated with the eruption of Sakura-jima, Jan. 12, 1914; the epicentre was near the volcano, and the quake was of a character entirely different from that of the usual local volcanic quake.

The more important of the great number of other earthquakes which occurred during 1914-28 were: 1914, May 9, Sicily; 100 lives lost; Linera totally wrecked. 1916, Alaska, a severe quake, but the region affected was almost entirely uninhabited. 1917, June 7, San Salvador nearly destroyed; Dec. 25-29, Guatemala laid in ruins. 1918, Feb. 13, Swatow, China, several hundred perished; Oct. 11 and 22, Porto Rico, 150 lives lost, and a great deal of property destroyed; Apr. 21-23, considerable damage to property in southern California. 1919, Apr. 28, San Salvador partly destroyed; Nov. 27, several villages destroyed in western Asia Minor, and many lives lost; June 20, Central Italy shaken. 1920, May 14, heavy damage in Central Italy; Sept. 7, Carrara and surrounding territory suffered heavily, with 100 towns damaged or destroyed, and hundreds perished; January, southern Mexico; February, Transcaucasia, many villages destroyed; June 22, Los Angeles, Calif., considerable property damage. 1922, Jan. 31, a severe shock occurred off the California coast, resulting in minor damage at several points;

Nov. 11 and afterward, Chile, many lives and much property lost. 1923, near Lou-ho-hein, China, 1000 lives lost; May and September, Persia; disastrous shocks, December, Colombia and Ecuador; September, Calcutta, little damage. 1924, Mar. 14-15, five Costa Rican towns destroyed, with considerable loss of life; Apr. 14, southeast of Mindanao, a severe quake; May and September, Armenia, great loss of life. 1925, June 29, Santa Barbara, Calif., heavily damaged, and 12 lives lost, by strong local shock; Feb. 28, eastern United States and Canada rocked by a quake with epicentre south of Saguenay River in Quebec. 1926, June 26-27, Egypt and the islands of the Mediterranean and Aegean Seas, Crete and Rhodes damaged; great damage and loss of life occurred in Sumatra in June and July, and in Armenia in October and November. 1927, Mar. 7, many towns destroyed in central and western Japan, 6734 injured, 3274 killed; July 11, Palestine, 800 injured, 268 killed, in the first great quake of the region since 1837; considerable damage was caused in Jugo-Slavia in February; and on October 24 a quake of great magnitude occurred in Alaska, but without serious consequences, because of the sparsely settled character of the country. 1928, Dec. 1, Chile, 200 killed, great property damage especially in Talca and Chillan; March 22, April 13 and 17, June 16, and October 8, severe quakes in Oaxaco, Mexico, and neighboring regions; Oct. 4, Kaledijk, Turkey; April 9, Mucasaní, Peru; March 10, Nehandan, Persia; March 31 and April 24, Smyrna; April, series of intense quakes in southern Bulgaria, 100 killed, 700 injured; April 22, Corinth, Greece. See PHYSICS; SEISMOLOGY.

**EAST AFRICA PROTECTORATE.** See KENYA COLONY.

**EASTMAN, GEORGE** (1854- ). An American kodak inventor and manufacturer (see VOL. VII). He has continued the manufacture of photographic equipment on a large scale at Rochester, N. Y., where in connection with his plant, he has built up important research laboratories. On July 30, 1928, he announced the perfection of a process of color photography by which an amateur may take still or moving pictures reproducing all the colors of the spectrum. In recent years, he has been personally interested in calendar reform and in African wild-life photography. Mr. Eastman's gifts to education have exceeded \$50,000,000, including a \$4,500,000 endowment for the Eastman School of Music, established as a department of the University of Rochester in 1918, and \$4,000,000 to found a school of medicine and dentistry at the same institution in 1921.

**EASTON, FLORENCE** (1884- ). A British dramatic soprano, born at Middlesbrough-on-Tees, Yorkshire. She was educated in Toronto, Canada, where, at the age of 10, she made her first public appearance as a pianist. Subsequently, she studied singing at the Royal Academy of Music in London and with E. Haslam in Paris. In 1903, she made her début as Cio Cio San with the Moody-Manners Opera Company at Covent Garden. The next year, Savage engaged her to sing Kundry for his production of *Parsifal* (in English), which he took on an extended tour of the United States, and in 1906-07 she returned under the same manager, singing in *Madame Butterfly*. From 1907 to 1913, she sang leading rôles at the Royal Opera in Berlin and from 1913 to 1915 at the Stadtheater

in Hamburg. At the same time, she appeared at Covent Garden in the Wagner and Strauss performances. From 1915 to 1917, she was a member of the Chicago Opera Company, and then went to the Metropolitan Opera House, New York, where she immediately became one of the prime favorites. In 1904 she married Francis MacLennan, the tenor.

**EATON, JAMES SHIRLEY** (1868- ). An American railway specialist, born in Nashville, Tenn., who was graduated from Marietta College in 1889. He served as expert in the adaptation of the electric tabulating machines for railroad accounting, and from 1899 to 1903 was statistician for the Lehigh Valley Railroad. He was railroad editor for the *Wall Street Journal*, examiner for the Federal Trade Commission (1917-20) and statistician and economist for the Bureau of Economics and Engineering of the National Association of the Owners of Railway Securities (1921-22). During 1922-26 he was engaged in railroad expert work in New York City. He wrote *Railroad Operation* (1900); *Education for Efficiency in Railroad Service* (1910); *Railroad Expense Handbook* (1911).

**EATON, WALTER PRICHARD** (1878- ). An American author and critic, born at Malden, Mass., and educated at Harvard. During the period 1900-08, he was successively reporter on the *Boston Journal*, a member of the dramatic department of the New York *Tribune*, and dramatic critic of the New York *Sun* and later of the *American Magazine* (1909-18). He is the author of juvenile stories, out-of-door books, and publications on the theatre, which include: *The American Stage of To-Day* (1908); *At the New Theatre and Others* (1910); *Barn Doors and Byways* (1913); *Plays and Players* (1916); *In Berkshire Fields* (1919); *On the Edge of the Wilderness* (1920); *Boy Scouts on Katahdin* (1924); *Skyline Camps* (1924); *The Actor's Heritage* (1924); *A Bucolic Attitude* (1926); *Hawkeye's Room Mate* (1927).

**EBERLE, ABASTENIA ST. LEGER** (1878- ). An American sculptor, born in Webster City, Ia. She studied modeling with Frank Vogan in Canton, Ohio, and at the Art Students' League, New York, with George Grey Barnard. She was elected an Associate of the National Academy in 1921. Her first sculptures were copies of old gravestones in the cemetery at Canton. In New York, she found her inspiration in the life of the East Side, which she has interpreted with a great deal of sympathy. Some of her sculptures, "The Girl on Roller Skates" and "Mowgli," are in the Metropolitan Museum, New York "Little Mother" is in the Chicago Art Institute. Others are at the Worcester Art Museum, Carnegie Institute, and other centres. She exhibited in Europe with success.

**EBERLE, EDWARD WALTER** (1864-1929). An American naval officer, born at Denton, Texas, and graduated from the United States Naval Academy in 1885. He served on the *Oregon* in the Spanish-American War, in the Philippine insurrection in 1899, and commanded the Atlantic torpedo fleet from 1911 to 1913. He was superintendent of the United States Naval Academy from 1915 to 1919, and practically rebuilt its general organization and educational system. During 1921 and 1922, he was commander in chief of the Pacific fleet, with rank of admiral, and in 1923 was appointed Chief of Naval Operations in the Navy Department at Washington.

**EBERT, a'burt, FRIEDRICH** (1871-1925). A German statesman, born at Heidelberg. After an elementary education, he learned the saddler's trade, became a journeyman, and finally settled in Bremen. He was actively interested in the Social Democratic Party, edited the *Bremser Volkszeitung* in 1893, and was trade-union secretary to the Bremen Burschenschaft in 1900. It was not till 1905, when he was appointed to the Executive Committee of the Social Democratic Party, that he became widely prominent in politics. He was sent to the Reichstag in 1912 and was one of the influential members of his party who supported the Government in the World War. He attended the conference of Socialists at Stockholm in 1918. The same year, he was named Chancellor to succeed Prince Max of Baden. A strong opponent of the Spartacists, Bolsheviks, and Communists, he did more perhaps than anyone else to restore order to the country and to suppress insurrections during the revolution in 1918. He was elected first president of the Reich on Nov. 12, 1919, and his term of office was afterwards extended to 1925. His presidency was marked by the so-called Kapp putsch of 1920, the Bavarian coup of 1923, and the Saxon Communist movement of the same year. He died Feb. 28, 1925, shortly before the expiration of his term of office. Consult *Eines Menschen Weg* (1926), a biography by Emil J. Felden. President Ebert exerted a strong influence on the intellectual leaders of Germany, many of them becoming converted to the republican idea through contact with him.

**ECKENER, Hugo** (1868- ). A German airship designer and navigator, born in Flensburg. After work in economics, he took up the study of the construction and navigation of Zeppelins in 1908 and became an instructor in naval aviation during the World War and in 1920 a director of the Zeppelin Company. He made two dirigible flights to the United States from Germany, in October, 1923, as commander of the *ZR III*, and again in 1928 as commander of the *Graf Zeppelin*, repeating his successful trips to the United States in 1929 when he arranged for a round-the-world cruise. This was successfully completed from Aug. 7 to 29, 1929. Dr. Eckener then remained in the United States to arrange for the development of air transportation by dirigible with certain large financial interests.

**ECKERT, ek'ert, CHRISTIAN L. M.** (1874- ). A German economist, born at Mainz and educated at the universities of Munich, Berlin, and Giessen. He was made professor of political science in Cologne University in 1902. In 1904 he was called to the University of Bonn, in 1917 he was made *Geheimer Regierungsrat* (Privy Counsellor), and in 1919-20, first director of the University of Cologne, which had just been founded. His numerous works include: *Der Fronbote im Mittel-Alter* (1897); "John Ruskin" (in *Schmollers Jahrbuch* XXVI; 1902); "Deutsche Seefahrten nach Südamerika" (in *Schmollers Jahrbuch*; 1904); *Peter Cornelius* (1906); *Bildungsfrage des Journalistenstandes* (1913); *Die wirtschaftliche Bedeutung des Wehrbeitrages, Recht und Wirtschaft* (1914); *Wirtschaftliche und finanzielle Folgen des Friedens von Versailles* (1921); *Deutsche Romfahrt* (1921); *Altater Nü* (1924); and *Umstellung der deutschen Handelspolitik* (1924). He contributed many scholarly articles to lead-

ing periodicals and edited *Rothschilds Taschenbuch für Kaufleute* (58th ed., 1920).

**ECKLES, CLARENCE HENRY** (1875- ). An American professor of dairy husbandry, born in Marshall Co., Iowa. He graduated from the Iowa State College in 1895, and took post-graduate courses at the University of Wisconsin and in Germany and Switzerland. After a year as assistant in dairy husbandry in the Iowa State College, he became professor of dairy husbandry at the University of Missouri, remaining there until 1919, when he was appointed chief of the dairy-husbandry division of the University of Minnesota. He wrote *Dairy Cattle and Milk Production* (1911), *Dairy Farming* (1916), and also bulletins on agricultural subjects.

**ECOLOGY.** See BOTANY; ZOOLOGY.

**ECONOMIC ENTOMOLOGY.** See ENTOMOLOGY, ECONOMIC.

**ECONOMIC GEOLOGY.** See GEOLOGY.

**ECONOMIC ZOOLOGY.** See ZOOLOGY.

**ECUADOR, ek'wa-dör.** A South American republic on the northwest coast between Colombia on the north and Peru on the south. Its area was estimated in 1926 at 110,000 square miles, with 7430 square miles in addition for the Galapagos Island. In view, however, of still unsettled boundary disputes, the area of the country cannot be definitely fixed. A maximum claim put the area as high as 276,000 square miles. The estimated population in 1926 was given at 1,562,500. Quito, the capital city, has 80,000 inhabitants. Other large cities, with their populations, are Guayaquil, 100,000; Cuenca, 30,000; and Riobamba, 12,000.

**Industry.** Cacao is the principle crop; the total number of trees was between 80,000,000 and 100,000,000, with an annual yield of 42,000 metric tons, although in recent years production is diminishing. Exports of cacao beans in 1927 amounted to 21,766 metric tons compared with 38,224 in 1912. Coffee is increasing in importance, with an annual production from 6,000 to 10,000 metric tons. The exportation of tropical fruits, such as oranges, bananas, and pineapples, to the countries to the south also is important. The production of cotton, lentils, rice, sugar, and tobacco is increasing; ivory, nuts, and rubber are important forest products, whereas the output of lumber is gradually decreasing. Annual exports of Panama hats are valued at about \$800,000. The only mining of importance is carried on by one gold-mining company whose output in 1926 was 62,486 ounces. The oil fields of Santa Elena, worked by British companies, were producing 537,000 barrels by 1927, with a 1928 production estimated in excess of 1,000,000 barrels. In 1926 exports were \$12,763,000 and imports \$9,451,000; the United States took 39.7 per cent of the exports and furnished 42.4 per cent of the imports. Cacao constituted 49 per cent of all exports, followed by coffee. The total exports in 1928 through the ports of Guayaquil, Manta and Bahia amounted in value to 77,466,799 sucres (1 sucre=\$0.20) as against 69,073,389 sucres in 1927. Principal imports are textiles, foodstuffs, and hardware. Total exports in 1912 were \$13,689,696 and imports, \$10,354,564. The country has only a few small manufacturing plants.

**Communications.** Little building of railways has been done recently. Several short lines were projected and partially completed, notably those from Ambato to Curaray and from Quito to Esmeraldas. In 1928, 500 miles were in



operation and 100 miles more under construction. Airplane service has been established between parts of Ecuador and Colombia. Wireless telegraph stations are at Quito, Guayaquil, and Esmeraldas.

**Education.** After 1915 the educational organization underwent a series of changes. New curricula were introduced in the primary schools in 1916 and in the normal schools in 1917. In 1923 the 1488 schools in operation were attended by 101,378 pupils, as compared with 70,000 in 1911. In 1927-28 there were 1771 schools including government, municipal, and private schools having an enrollment of 128,746 and attendance of 111,699 pupils, with 2399 teachers. In 14 national "collegios" for secondary education, there was an enrollment of 2284 students with 226 teachers, while the four universities had a total enrollment of 777 distributed as follows: Central University, Quito, 380; University of Guayaquil, 240; University of Cuenca, 125, and University Cuneil of Loja, 32.

**Finance.** The budget for 1913 carried revenues and expenditures at \$9,921,000; in 1928 the ordinary budget balanced at \$10,318,000. Up to 1914, exchange was maintained at par (1 sucre=\$0.487). The outbreak of the World War caused the suspension of the gold conversion of paper and, with the continuing unfavorable trade balance, the value of the sucre steadily fell. From 1917 on, the Government attempted to fix a legal exchange rate, but an open-market rate prevailed. In December, 1923, the official rate was 4.0 sucres to the dollar, but by 1927, an entirely new financial system had been installed under the leadership of Dr. E. W. Kemmerer of Princeton University. A governmental central banking system was inaugurated and a new monetary law stabilized the sucre at \$0.20. On June 30, 1928, the total public debt was 17,018,066 sucres, as compared with 49,355,427 sucres in 1925 and 70,101,412 in 1922.

**History.** Internal affairs were turbulent well into 1915 under President Plaza. Under President Baquerizo, 1916-20, the administration was busied with fiscal affairs, in which the demands of the Guayaquil & Quito Railroad Company, the leading holder of the foreign debt, played a prominent part; the country was also involved in difficulties with the belligerent nations. The Allies protested against Germany's use of the Galapagos Islands as coaling stations and in spite of official disclaimers Ecuador's neutrality was questioned. In 1917, however, diplomatic relations with Germany were severed and Ecuador thus technically became a member of the Allied and Associate Powers. Up to 1929, it had not joined the League of Nations. By the treaty of 1916, a boundary commission was appointed to adjust the frontier between Ecuador and Colombia; the work was finished in 1919. The work which was commenced under General Plaza in the cleaning up of Guayaquil in 1913 was renewed in 1918 under Colonel Gorgas and came to a satisfactory conclusion two years later. In 1920 it was officially reported that the danger of yellow fever had been eliminated not only in Guayaquil but in several adjacent provinces. In 1920 an unsuccessful attempt was made by a British company to purchase the Galapagos Islands with a view to exploiting their valuable guano deposits. The president of Ecuador for 1920-24 was Dr. José L. Tamayo. For the term 1924-28, Dr. Gonzalo S. Cordoba was elected, but on July 9, 1925, his administra-

tion was suddenly cut short by a military *coup d'état*. The President was arrested and shortly thereafter resigned. He was exiled to Chile where he died in 1928. The military junta organized a government with Señor Modesto Jijón as Premier and General Gomez de la Torre as Minister of War and Navy. In April, Dr. Isidro Ayora became provisional President pending the calling of a constituent assembly. He presently established a dictatorship and set about effecting many reforms. Chief of these was a thorough reorganization of government finances. The Kemmerer commission, which began work in October, 1926, recommended 25 projects for putting the country's finances on a sound basis. In accordance with these recommendations, a central bank was established, beginning operations in August, 1927, and the sucre was placed on a gold basis. American experts were engaged as controller of the currency, superintendent of banks, collector of customs, and adviser to the central bank.

A return to constitutional government was decreed by President Ayora in July, 1928. On August 14, the United States gave *de jure* recognition to the existing government. A constitutional assembly was elected and on October 10 it reelected Dr. Ayora as provisional President. In accordance with the new constitution, the assembly, on Mar. 27, 1929, elected him as constitutional President for a five-year term and he was inaugurated on April 12. After debate the new constitution was ratified in the spring of 1929 and on March 25 it was proclaimed.

**EDDINGTON, ARTHUR STANLEY** (1882- ). An English astronomer and physicist, born at Kendall and educated at Owens College (now Manchester University), Trinity College, and Cambridge. He was chief assistant at the Royal Observatory, Greenwich, from 1906 to 1913, when he became Plumian Professor of astronomy at Cambridge. He was president of the Royal Astronomical Society in 1921-23 and became recognized as a leading authority on relativity. His most important publications are *Space, Time, and Gravitation* (1920); *The Mathematical Theory of Relativity* (1923); *The Internal Constitution of the Stars* (1926); *Stars and Atoms* (1927); and *The Nature of the Physical World* (1928); *Science and the Unseen World* (1929). See *ASTRONOMY*; *PHYSICS*.

**EDDY, SHEERWOOD** (1871- ). An American author and a secretary of the Young Men's Christian Association, born at Leavenworth, Kan., and educated at Yale. As a national secretary of the Y. M. C. A., he worked in an honorary capacity among students in Japan, Korea, China, India, the Near East, and Russia. In the World War, he was Y. M. C. A. secretary with the British Army, 1915-17, and with the American Army in 1917. Besides works published in England and India, he wrote: *The Awakening of India* (1911); *The New Era in Asia* (1913); *The Students of Asia* (1915); *Suffering and the War* (1916); *With Our Soldiers in France* (1917); *Everybody's World* (1920); *Facing the Crisis* (1922); *The New World of Labor* (1923); *New Challenges to Faith* (1926); *Religion and Social Justice* (1928).

**EDGAR, WILLIAM CROWELL** (1856- ). An American editor and publisher, born at La Crosse, Wis., and educated at a St. Louis high school. He became manager (1882) and editor (1886-1924) of the *Northwestern Miller*, and president of the Miller Publishing Company.

He established and edited *The Bellman* (1906-19). For his part in the relief given to Russian peasants in 1891, he was decorated by the Emperor of Russia. During the World War, he assisted in the Belgian Relief movement and aided Herbert Hoover in the organization of the American milling industry. His publications include: *Story of a Grain of Wheat* (1903); *Brief in Behalf of American Millers* (1913); *Food Control and Food Fallacies* (1917); *England During the Last Months of the War* (1918); *Rhymes of a Doggerel Bard* (1921); *The Medal of Gold* (1925); *Judson Moss Bemis, Pioneer* (1926); *Christmas at Dingley Dell* (1926).

**EDGE, WALTER EVANS** (1874- ). United States Senator, born in Philadelphia. He learned the printers' trade in Atlantic City (N. J.) newspaper offices, later becoming proprietor of two of them and establishing a national advertising agency. After serving in the Spanish-American War, he became secretary to the New Jersey State Senate (1911-04), member of the Assembly (1910), State Senator (1911-16), Republican leader of the Senate (1912), and Senate president (1915). He took an active part in securing the passage of bills for workmen's compensation, a State budget system, and a central purchasing bureau, and was elected governor for the term 1917-20, resigning in 1919 to take a seat in the United States Senate for the term ending in 1925. He was reelected for the term 1925-31. He was chairman of the Senate Committee on Inter-oceanic Canals and a member of the Banking and Currency and Finance Committees. In 1929 President Hoover appointed him Ambassador to France to succeed Myron T. Herrick.

**EDINBURGH.** The capital of Scotland and seat of the supreme court, of various departments of government, of the general assemblies of the Scottish churches, and of the military headquarters for Scotland. The population rose from 320,318, in 1911 to 420,264 in 1921; in 1928 the estimated population was 426,300. The municipal area is 32,402 acres. Since 1920 the official bounds of the city have been extended so as to include the Burgh of Leith and part of the suburban district of the County of Midlothian. The city is governed by a town council of 71 members and sends 6 members to Parliament. Recent municipal improvements include the erection of a new generating station at Portobello, with a total projected capacity of 100,000 kilowatts, intended to meet the present and future requirements not only of the city but of the surrounding area. The corporation has also established on the outskirts of the city new cattle and corn markets and slaughter houses (in substitution for those which were situated in the centre of the city), at a cost of £140,746. The magnificent Scottish National War Memorial, which was designed by Sir Robert Lorimer, consists of a Hall of Honor and a heptagonal shrine, "To the Glory of God and in Memory of Scots Who Fell (1914-1918)." The seven windows are filled with stained glass, depicting war as a mysterious element in the destiny of man, and below are reliefs showing types of all who served in the World War. In the niches between the windows are figures of the virtues and stone panels with the insignia of the four Scottish divisions that fought in the War. The memorial was opened by the Prince of Wales on July 14, 1927. The same year, a beautiful war memorial was erected by

Americans of Scottish descent. In June, 1929, the 600th anniversary of King Robert the Bruce's charter to Edinburgh was celebrated, with pageantry depicting famous episodes in the history of Edinburgh and the unveiling of statues to Bruce and Wallace by the Duke of York.

**EDISON, THOMAS ALVA** (1847- ). An American electrician and inventor (see Vol. VII). The following inventions are accredited to him: Universal Stock Ticker; quadruplex and sextuplex telegraphic transmission; microstatemeter; phonograph; incandescent lamp and light system; moving pictures; alkaline storage battery; mimeograph; poured-concrete houses; transmitter of the telephone; microphone; magnetic separator. He has received more than 1000 patents. His later work was devoted chiefly to the perfection and improvement of inventions already made. At the outbreak of the World War, he designed, built and operated successfully benzol plants, carbolic-acid plants, and plants for the making of aniline salt and other products. In July, 1915, he was appointed president of the Naval Consulting Board, and in this capacity performed valuable service to the Government, for which he made many war inventions. In 1929 he received many honors on the occasion of the celebration of the fiftieth anniversary of the incandescent lamp.

**EDMUNDSON, THE REV. GEORGE** (1848- ). An English clergyman and historian (see Vol. VII). He was vicar of St. Saviour's, Walton Place, Upper Chelsea (1906-20), and rural dean of Chelsea (1916-20). In 1922 he published *A History of Holland* (Cambridge Historical Series) and *The Journal, Travels, and Labours of Father Samuel Fritz, in the River Amazon, 1686-1723*. The latter was translated and edited from the original Spanish manuscript for the Hakluyt Society.

**EDSON, KATHERINE PHILIPS** (MRS. CHARLES FARWELL EDSON) (1870- ). An American social worker and feminist born at Kenton, Ohio, and educated in private schools. In 1912 she became a member of the Progressive Party's State central committee of California, serving for four years. Well known as an arbiter in labor disputes, she was responsible for the Minimum Wage Bill which the California Legislature passed in 1913. From 1916 to 1920, she was a member of the executive committee of the Republican State committee and, subsequently, a delegate to the Republican National Convention (1920) and a member (1920-24) of the executive committee of the Republican National Committee. In 1921 she became a member of the advisory committee of the Conference on the Limitation of Armaments. Since 1927 she has been chief of the Division of Industrial Welfare of the California Department of Industrial Relations.

**EDSTROM, DAVID** (1873- ). A sculptor, writer, lecturer, and teacher who came to the United States in 1880 from Hvetlanda, Sweden, where he was born. At 21 he decided to study art, and worked his way to Stockholm, where he attended the technical schools and the Royal Academy of Fine Arts as a pupil of Borjison. He then went to Florence and Paris, where he studied with Injalbert. He has exhibited in most of the leading cities of the United States and Europe and is best known for his metaphysical sculptures, "Fear," "Pride," "Envy," "Caliban," "The Cry of Poverty." An artist of versatile moods, Edstrom always

shows in his work the psychic character of his subject. He has made portrait busts of the Crown Prince and Princess of Sweden and many other important persons. In 1924 he lectured at Upsala University.

**EDUCATION.** See **EDUCATION IN THE UNITED STATES**; paragraphs on *Education* in the articles on the separate States and on foreign countries; and **UNIVERSITIES AND COLLEGES**.

**EDUCATION, AGRICULTURAL.** See **AGRICULTURAL EDUCATION**.

**EDUCATION IN THE UNITED STATES. STATISTICS. Attendance.** The report of the U. S. Commissioner of Education published in 1928 shows that the enrollment in public kindergartens in 1925-26 was 673,231 and in private schools 54,456, making a total of 727,687. In public elementary schools, there were 20,310,771 and in private schools 2,088,644, the total being 22,399,415. The total enrollment, therefore, in elementary and kindergarten was 23,127,102. The enrollment in the elementary school has increased 63 per cent since 1890. The general population, however, increased 87 per cent, while the school population, those of ages five to seventeen, inclusive, increased 62 per cent. It appears, therefore, that the enrollment in public schools has kept pace with the school population, but the school population has not increased as rapidly as the general population.

The enrollment in public secondary schools was 3,757,466 and in private schools and academies, 295,625, making a total of 4,053,091. There were also totals of 5,632 secondary students in preparatory departments of colleges and 23,402 in secondary courses in normal schools and teachers' colleges. The number of secondary students, therefore, was 4,132,125. The enrollment in secondary schools shows an increase of 1,055 per cent since 1890. In 1890 only 1.6 per cent of the school enrollment was in high schools. In 1926, however, 15.2 per cent of the total enrollment was in high schools.

During the school year 1925-26, a total of 434,539 pupils were graduated from the public high schools. Of this number, 190,054 were boys and 244,485 were girls. Of those who were graduated in 1925, about 37 per cent of the boys and 28 per cent of the girls entered college in 1926. The percentage of 1925 graduates who entered college in 1926 varies greatly between States. In South Carolina, the rate is 54 per cent, while in Maine it is 15.4 per cent.

For the school year 1925-26, the enrollment in public normal schools including teachers' colleges was 51,105 men and 201,802 women; a total of 252,907. In private normal schools and teachers' colleges, there were 3116 men and 14,183 women—a total of 17,290. Teacher-training students in public high schools numbered 7113 boys and 40,442 girls, a total of 47,555. In the private high schools and academies, there were 491 boys and 2521 girls, a total of 3012. The enrollment in the teacher-training departments of public colleges were 20,722 men and 58,378 women, a total of 79,100. In the private colleges, there were 24,855 men and 69,502 women, a total of 94,417. The grand total of those preparing to teach was 494,290. There are about 900,000 teaching positions in the United States. It appears, therefore, that there is one prospective teacher for every two positions.

The enrollment in special schools, public and private, was as follows:

Industrial schools for delinquents,	84,844
Schools for deaf,	17,496
Schools for the blind,	6,084
Schools for the feeble-minded and subnormal,	104,021
Schools for Indians,	29,158
Schools in Alaska,	8,055
Commercial and Business schools,	188,363
All schools in outlying parts of the United States,	149,928
The enrollment in universities, colleges, and professional schools,	767,263

There were enrolled in extension courses 390,565 students, and in summer courses 209,454. There were 62,604 students in practice and model schools and 3,772 in winter short courses. The grand total of enrollment in all types of schools was 31,037,736.

In 1925 more than 80 per cent of all of the children enrolled in kindergartens, elementary schools, and secondary schools attended each day. In that year, the schools were in session an average 169.6 days. Each child, therefore, attended on an average 136.5 days.

The average length of school life shows a remarkable increase. In 1800 the average number of days that a child spent in school was 80. In 1840 he spent 208 days in school. In 1870 the length of his school life was 582 days. In 1890 it was 770 days. In 1920 it was 1200 days, while in 1924 each child on the average was in school a total of 1246 days.

**Costs.** The total cost of public elementary schools for 1925-26, including kindergartens, was \$1,308,396,445. The public high schools cost \$697,911,735. Private elementary schools cost \$135,679,661; private high schools and academies, \$54,909,388. If the costs of all the special schools and universities and colleges be included, the total is \$2,744,979,698.

The estimated cost per pupil enrolled in 1925-26 was \$63.31 in the public elementary schools, \$185.74 in the public high schools, and \$599.81 in public universities and colleges. The increasing cost of schools has brought about serious controversies in various cities and States. In some places, there are organized bodies whose purpose is to decrease the expenditures for public education. Those who urge a decrease in expenditure point to the fact that in 1913, the per-capita cost in public schools, based upon the number in average daily attendance was \$38.31. It was \$40.43 in 1915, \$49.12 in 1918, \$64.16 in 1920, \$95.45 in 1925, and \$102.05 in 1926. In 1915, the total expenditure per capita of population was \$6.03. It was \$9.80 in 1920, and \$17.30 in 1926.

Those who oppose decreasing the school expenditures present statistics showing that the total educational expenses in 1926 were only 18.86 per cent of the expenditures for automobiles, and 36.14 per cent of the expenditures for luxuries including tobacco, soft drinks, ice cream, candy, chewing gum, theatres, jewelry, perfumes, cosmetics, sporting goods, toys, etc.

There is a pronounced tendency among school officials to reduce expenses wherever possible. Sometimes this has been accomplished by increasing the size of classes, so as to reduce the number of teachers. Sometimes cities have eliminated activities whose values were not clearly established.

**Property.** The State Departments of Education reported a total value of public elementary and secondary school property for 1926 of \$4,676,603,539. Private high schools report \$511,544,000. Teacher-training institutions, in-

cluding their endowments, had a total valuation of \$202,630,512, and colleges and universities, \$2,334,307,421. It is estimated that the property of private elementary schools is valued at \$400,000,000. This would make the total valuation for the institutions mentioned \$8,125,085,472.

**Teachers in the Public Schools.** In 1924, the last year for which data are available, the public kindergartens employed as teachers 10,852 women and private kindergartens, 2,140. In 1926 the public schools employed 75,436 men and 569,195 women, a total of 644,631. The public high schools employed 63,364 men and 106,164 women, a total of 169,538. Private elementary schools employed 1072 men and 54,570 women, a total of 56,272. The private high schools employed 7397 men and 12,748 women, a total of 20,145.

**Negro Education.** The U. S. Bureau of Education has published a summary of statistics of education of the Negro race in 18 Southern States. The enrollment in public schools was 2,218,312. The enrollment in public high schools was 55,083. The average number of days attended by each pupil in the school year 1925-26 was 93, and the average length of the school year was 132 days. Nearly 69 per cent of the Negro school population in these States was enrolled. The teachers in the Negro schools in these 18 States number 7591 men and 37,434 women, a total of 45,025. Throughout the United States, the enrollment of Negro pupils in all public schools was 38,129 boys and 60,576 girls, a total of 98,705. In addition, there were 10,261 students in private high schools. In the privately controlled universities, colleges, and professional schools for Negroes, there were in the preparatory departments 2568 men and 3002 women, a total of 5590. In the collegiate departments, there were 3840 men and 3765 women, a total of 7605. In the graduates' departments, there were 30 students equally divided between men and women. In the privately controlled universities, colleges, and professional schools for Negroes, there was an enrollment of 7593 men and 6363 women, making a total of 13,956. The public teacher-training institutions for Negroes enrolled 16,588 students of whom 3932 were men and 12,656 were women. The private institutions enrolled 5277 of whom 2299 were men and 2978 were women.

**Adult Education.** The movement to provide for the education of adults has reached a stage of thorough organization. A large number of institutions are coöperating in making it possible for a person anywhere in the United States to secure training in practically any subject that he may care to choose. The American Association for Adult Education, with headquarters at 41 East 42d Street, New York City, acts as a clearing house for all matters relating to adult education. The U. S. Bureau of Education has collected information from various institutions regarding their facilities for help. The results were published in *Bulletin* 23, 1928. Among the more important offerings are the following:

**Correspondence Study Courses.** Practically any subject desired may be taken through a correspondence course conducted by some institutions in the country. The student is expected to write all of the lessons and send them to the instructor. He in turn corrects the papers and returns them with his criticism. Anyone who

may be interested in undertaking correspondence courses should write to the State University.

**Class Work Outside of Institutions.** It is claimed that in every State of the Union there are institutions of higher learning that give class work outside of their walls. An instructor from the institution concerned meets the classes and conducts the work in much the same manner as is employed within the institution. In most cases, the institutions are compelled to require a certain minimum enrollment in order to justify them in providing the instructor. In some cases, this minimum is as low as 10 persons. Any individual desiring information regarding the possibility of extension work in his own community should make inquiry from his public-school department.

**Public Lectures and Lyceums.** It is reported by 195 colleges and universities that they render service for women's clubs, teachers' institutions, commencement exercises, and so on by providing lecturers either from their own faculties or from other sources. Many of them also furnish music and slides and films to illustrate lectures that may be used by local talent.

**Visual Instruction.** It is reported by 52 colleges and universities that they furnish visual aids for instruction and entertainment purposes. Some of these institutions offer short courses to teachers and club leaders on how to make use of visual aids that they supply.

**Home Reading Courses.** It is reported by 37 institutions that they provide home reading courses. The U. S. Bureau of Education provides no less than 31 such courses. The American Library Association supplies a series entitled *Reading With a Purpose*. There are short reviews of the books to be read. In addition to the courses supplied by the U. S. Bureau of Education and the American Library Association, courses have been prepared by the institutions themselves.

**Publications Educational in Nature.** All State universities, land-grant colleges, and some other institutions distribute publications educational in nature. In addition, the Federal Government issues many leaflets, bulletins, and other publications for general distribution. Anyone interested in such publications should communicate with his State University or with the Superintendent of Documents, Government Printing Office, Washington, D. C.

**Public Information and Package Library Service.** Information service for the public is rendered by 59 colleges and universities. This offering takes the form of library service in which the use of the institution's library is made available to all who request it or package libraries which are made up largely of magazine clippings selected from current issues of pamphlets and reports. Some of the institutions collect and send packages on more than one thousand subjects. To supplement the assistance offered by library and package library service, some of the institutions through extension divisions prepare and supply bibliography and study outlines. The University of North Carolina furnished such assistance to no less than 700 clubs during one year.

**Community Drama.** There are 54 colleges and universities assisting local communities in interpreting through pageants, folk plays, and dramas the spirit and the history of the State. The University of Indiana has a collection of

more than 1000 plays that have been found suitable for schools, churches, and clubs.

*Institutes, Conferences, and Short Courses.* There are 141 institutions equipped to aid local communities by holding institutes, conferences, or short courses. The conferences and institutes deal with local or State problems. The courses deal with a great variety of subjects such as various phases of farming and home problems. There is an increasing demand for short courses for business men and technical workers in such subjects as salesmanship, applied psychology, highway engineering, and banking.

*Parent-Teacher Association or Other Club Service.* There are 64 institutions equipped to promote parent-teacher associations or other club service by assisting in the formulation of programmes, distributing literature, and in some cases by helping in the preparation of monthly bulletins. The parent-teacher movement has developed to such an extent that a number of colleges provide courses on the principles, practices, and policies of parent-teacher associations.

*Radio.* There is an increasing number of courses offered by radio. Radio is used by 65 institutions either in giving lectures or in conducting other extension work. At present, there is no way of determining how many people are assisted by such courses, but 5000 people enrolled for courses given by radio by the division of university extension of the Massachusetts State Department of Education.

*Curriculum Revision.* Changing the curricula or courses of study in the elementary and secondary schools has been an important activity in educational circles since 1920. For 30 years prior to this time, attention had been focused primarily upon methods of teaching. New subjects had from time to time been added, but little attention had been devoted to the selection and organization of subjects, so that they might conform to the teachings of modern psychology and sociology. As a result, the curriculum has been crowded, and there is a growing conviction that much of the subject matter taught is not of real value. At the same time, it is believed that many subjects of real value have been omitted.

The methods used in producing new curricula differ very decidedly from those employed earlier. It has been customary to depend upon one person or at most a small group to develop particular courses of study. At present, each person connected with administration, supervision, and instruction has a responsibility. In some cities, teachers have been freed from their regular class-room work for a period of several months in order that they might put their entire time and attention to the development of new courses of study.

In the past, little attention was given to the selection of subject matter that met the needs of a given community or that took into account the interests of the children. Now the selection of material which shall be taught represents a serious attempt to analyze conditions that affect the child as well as society at large. The effort is made to combine or fuse subjects in order that they may better meet the needs of the school.

The traditional curriculum had a strictly logical organization of its subject matter. There is a strong tendency now to organize the curriculum about activities or problems with which the children are expected to deal.

The professional literature bearing upon the curricula has greatly increased. Courses bearing upon this subject have been introduced into all the teacher-training institutions, and all the national organizations connected with education have devoted much time to the discussion of this topic, several having published important year books that deal with curriculum construction.

*Industrial Education.* Three major purposes may be recognized in the provisions that are made for industrial education in the public schools. These have been described by Maris M. Proffitt in a bulletin entitled *Industrial Education*, published by the U. S. Bureau of Education. They are:

1. Training for the creation of an industrial product or service. For example, training for carpenters, bricklayers, welders, pattern makers, foundrymen, and tailors is for the purpose of providing an industrial product. The training involved in fulfilling this purpose is strictly vocational and must, therefore, be given in special schools or in schools having special equipment.

2. Training in the use of industrial products and services, common to home life and leisure-time activities, and which are of a non-vocational character. For example, training in the common and ordinary use and care of such industrial products as furniture, automobiles, electrical machinery, and apparatus, and for such industrial services as electricity, gas, and water in the home. The aim is to make more intelligent consumers. The courses that are offered for this purpose are not designed to train pupils for employment. They are a part of the general educational programme in most modern schools.

3. Training in exploratory and developmental forms of experience. Courses offered for the realization of this objective include projects in a variety of activities, such as woodworking, metal working, painting, and electricity. The work is planned not to give the first part of several trade courses but to provide the individual, through controlled experiences, opportunities to react in connection with a variety of materials, tools, and operations.

*Intelligence Testing.* Since the World War, public schools have given a large amount of attention to the testing of the intelligence of pupils. While this plan is not universal, it is true that by far the greater number of pupils in the United States have been tested. In recent years, there has been a marked tendency toward grouping children on the basis of their abilities. The child's standing in the intelligence test has been one basis for such grouping. In the language of the school, there have been X, Y, and Z groups. Usually the X group represented those of superior ability and attainments; the Y group, those who are normal; and the Z, those who are inferior. This method of grouping children has developed as a logical procedure rather than as the outcome of definite research. It has brought in its wake many protests and a large amount of dissatisfaction. Those who have favored the plan have undertaken to answer the objections that have been raised, and they have made a very plausible case for intelligence testing.

There are three well-defined positions in regard to intelligence testing, especially as applied to public-school children. Those who have been instrumental in developing the intelligence tests have in general assumed a very decided validity for the tests. They have asserted in effect that intelligence is an inherited quality and that it does not change. There have been schools in which children have had their intelligence tested in the first grade, and this has been taken as a measure of their intelligence throughout the elementary school period. Those who employed this procedure have made the as-



sumption that intelligence can be measured and is measured by tests that are now in existence.

Directly opposed to the view just mentioned has been a conception that intelligence cannot be measured by any of the devices that are in existence at the present time. Those who advocate this view insist that, even though it were possible to measure intelligence, it would be a most dangerous procedure, for it would inevitably lead to an aristocracy as well as to unlimited discouragement and distress. They, therefore, condemn unqualifiedly any attempt to make use of any intelligence testing in the public schools.

There is a third group who insist that the intelligence tests as we now have them tend to measure environmental influences quite as much as they measure inherited capacities. This group would not condemn the use of the tests, but they do condemn the interpretations that have been placed upon the results.

The National Society For the Study of Education appointed a committee of outstanding psychologists who brought together in a year book the significant investigations. The year book, which appeared in February, 1928, is entitled *Nature and Nurture, Their Influence Upon Intelligence*. Briefly stated, the results of investigations and experiments seem to show that the child's intelligence as measured by tests is affected by environment.

It is too early to determine the effect that these investigations will have upon the practice in the schools; it is true, however, that the findings have received serious attention, and there is now a tendency among psychologists to be more conservative than was the case earlier.

**New Departures in Elementary Education.**  
*Junior High Schools.* Studies of school attendance beginning in 1907 called attention to the remarkable dropping off of students between the elementary and high school and in the first year of the high school. A study of the reasons for this led to the belief that the lack of coordination between the elementary school and the high school was largely responsible for this condition. Almost none of the subjects studied in the elementary school were continued in the high school. Between the two institutions was a sharp cleavage in organization as well as in teaching methods. The last year of the elementary school was largely devoted to a review of the work of the school. These and other considerations led school officials to formulate plans for the organization of a new element in the school system, which came to be known under various names, most commonly, junior high school. This school usually cares for the children of the seventh, eighth and ninth school years. The effort is made to have the courses of study include a wider range of subjects than under the other form of organization. This is for the purpose of giving boys and girls the opportunity to explore various fields and and to determine their fitness for such work as will follow in the high school, which under this plan is known as the senior high school. The junior high school, or intermediate school, as some prefer to call it, has now reached a position of great importance. There are no less than 3058 schools of this character, and most cities are now making provision for them in their new building programmes.

*The Platoon School Organization.* This form of school organization, also known as the "work-

play-study" school, was designed to meet the newer conditions which exist especially in the larger cities. It has been extensively employed in the schools of Detroit. Typical platoon schools have 20 to 28 sections or classes of 40 pupils each. The buildings provide a gymnasium, an auditorium, open-air play rooms, special rooms for music, art, literature, science, and library, and "home rooms" which correspond to the usual class rooms. The standard school day is six hours long, a three-hour session in the morning and a three-hour session in the afternoon. The usual morning session is from 8:30 to 11:30, and the afternoon session from 12:30 to 3:30. Some schools have a somewhat longer noon period. With the exception of pupils of the first grade and those especially excused, all pupils remain in school six hours and are busy during this entire period. The school membership is divided into two groups or platoons. While one group is engaged in the home room, or regular room, the other group is attending classes in the special rooms. Thus, half of the pupils are in the home rooms at any given time and the other half are engaged in special activities. For home-room activities, the school day of 6 hours is divided into four periods of 90 minutes each. Each platoon has home-room work for 90 minutes in the morning and 90 minutes in the afternoon.

For special-room activities, the 6-hour day is divided into 12 30-minute periods. Each platoon is engaged in special activities during 6 of these 12 30-minute periods each day. Each pupil spends 90 minutes of the morning in the home room under the control of the home room teacher and the remaining 90 minutes of the morning in the special activities, 30 minutes in 3 separate special rooms. In the afternoon, he again spends 90 minutes in the home room and the remaining 90 minutes in 3 special rooms. The number of special-room activities possible in a platoon school is determined by the number of classes or groups of pupils involved. If there are 20 classes, the school must house 800 pupils, or 400 in each platoon. This requires 10 home rooms to care for 400 pupils. The remaining 400 pupils may be provided for in special rooms. The cost of buildings for the platoon schools is somewhat greater per pupil in the 20-section schools and a little less in the 28-section schools than in the traditional schools. The capacity of the school building is increased by more than 40 per cent by the platoon organization. The per-capita cost of instruction is about the same in both types of schools.

*The Dalton Laboratory Plan.* Following 1890 many efforts were made to provide individual instruction in the class room. Some of these plans were widely advertised and they were introduced into various school systems. By 1920, however, scarcely an evidence of these earlier attempts existed. The demand for individual attention had increased rather than diminished. The Dalton Laboratory Plan as developed by Miss Helen Parkhurst and first used in 1919 has become one of the outstanding plans for providing individual instruction.

Miss Parkhurst first tried her plan with a group of crippled children in 1919. The next year, it was introduced in the Dalton, Mass., High School. Miss Parkhurst spent the summer in 1921 in England, where she conducted a model school according to the Dalton Laboratory Plan and lectured to groups of teachers

and school officials. The plan was immediately adopted by a large number of schools throughout England. It is estimated that more than 7000 schools in the United States are conducted at least in part according to this plan. Miss Parkhurst conducts a school of her own in New York City. It is called The Children's University School. Her book, *Education On The Dalton Plan*, has been translated into several languages, and she has been invited by various foreign countries to aid in the reorganization of some of their schools.

The Dalton Laboratory Plan may be applied in the high school and in the elementary school from the fourth grade up. For convenience, the different parts of the curriculum are divided into major and minor subjects. The former group includes mathematics, history, science, English, geography, foreign languages, etc.; the latter, music, art, handiwork, domestic science, manual training, gymnastics, etc. Miss Parkhurst advises that the plan be introduced with major subjects first. Each subject is then divided into what would correspond to 20-day periods or jobs and the pupil accepts the jobs assigned for his class for a month as a contract. Each child has in his possession a complete outline of the work which he will be required to do for four weeks. These outlines, made by the teachers, are explicit. The children are grouped much as they would be in a regular public school and are always identified with forms or grades. At the opening of school in the autumn, the child receives the assignment of jobs that he is supposed to do in the next 20 school days, or four school weeks. Having accepted his contract, the child is free to approach his work in any way he may choose. No classes are taught as in the ordinary school procedure. A child may, for example, choose to do all of one subject during the first few days and to leave the other subjects untouched. He knows exactly how much he must do, and he knows at the end of each day of study how far he has progressed. He must complete the entire contract before he can receive other jobs, but he may receive the next contract whenever he has completed the jobs called for in the contract under consideration. If, therefore, he is able to accomplish the work planned for four weeks in three weeks, he immediately goes to the next contract. If he cannot complete it in the four weeks, he may have a longer time. In this way, each child progresses at his own rate.

The different classes or forms meet occasionally, perhaps two or three times a week, for group conferences with their teachers. Aside from these group meetings, the teachers deal with individuals, and the pupils call for help when they need it and are required to report on progress in accordance with their assignment. The rooms in which the teachers meet the children are called laboratories instead of class rooms. In the Children's University School, there is no such furniture as in an ordinary school room. Since the children do not recite as an entire class, there is no need for a large number of seats or desks in a room. They come to the laboratory for the purpose of consulting the books there, or to consult the teacher.

A system of charts or graphs designed by Miss Parkhurst makes it possible for the teacher as well as the child to know just where they stand. The teachers therefore are able to assist the children in properly apportioning their time.

It is claimed that children very soon learn to apportion their time in the most effective way.

*Nursery School or Pre-kindergarten.* The education of children of pre-school age is receiving a large amount of attention. There are those who have made the claim that much adult life is dependent upon the way in which the individual is treated in the first three or four years of his life. A significant outcome of the study of young children has been the formation of a new type of school called the nursery or pre-kindergarten school. In such schools, children from two and one-half years up are received and given such training and exercise as they are supposed to require. These schools should not be confused with the institutions formed to take care of the young child in order that the mother may be permitted to work. The nursery school receives children from all types of homes, and it has its justification in its efficiency as an educational institution. There are a number of private nursery schools. In some cases, schools of this character are conducted in connection with social settlements, public health centres, day hospitals, etc. Various colleges, universities, and teacher-training institutions support nursery schools in connection with their model or practice schools. No public-school system has yet assumed the entire responsibility for operating a nursery school. This is due in part to the lack of legal rulings that would permit the appropriation of funds for such expenditures.

Research centres in the field of nursery education have been established at Columbia University, Cornell University, University of California, University of Iowa, Johns Hopkins, University of Minnesota, Yale University, and Merrill-Palmer School of Home Making, in Detroit. The Laura Spelman Rockefeller Foundation has given financial assistance toward furthering research of this character.

*Progressive Education.* Since 1918 the term "progressive education" has been employed to designate either a certain theory of education or the practice that is followed in some schools. The theory that gave rise to this name differs from that which has operated in public and private schools in that it emphasizes the importance of the individual and urges a greater respect for individuality and freedom than is found in traditional schools. The work that takes place in such schools is usually characterized by a large degree of informality. Children are encouraged to be creative rather than to conform to standards that have been set by others.

Progressive schools do not ignore such requirements as college admission, but in general they do not require strict adherence to a set course of study or to the following of a single text. It is maintained that children who are treated in this more liberal way obtain not only a wealth of knowledge, skills, and attitudes that are usually lacking in the traditional schools but also they obtain a better control over the formal subjects that are made the basis in the ordinary school. There has been no extensive investigation into the validity of the claims made by those who advocate progressive education. In some cases, schools that have claimed to follow this plan have failed. Others have found it necessary to modify their plans to the extent of utilizing at least some of the methods

in regular schools. Still others are apparently succeeding in following the general notions that have been advanced. It is generally conceded, however, that this movement has had an important influence on the regular schools. Many of the plans that have been advocated by those who believe in progressive education have been adopted.

**Vocational Education. Part-time Courses.** There is an increasing interest in part-time and evening courses on the part of those who have entered upon employment. In general, the students who attend such classes are subject to the part-time educational laws which provide that all young people who are employed must attend school for a given number of hours each week until they reach a certain age which varies in the different states. In Chicago, the age limit is 17 and may be extended to 18. In New York, the limit is 18 years. The use of part-time courses is not confined to those who are compelled to attend. Young workers who desire to become more proficient are attending such courses in increasing numbers. There are in existence part-time apprenticeship courses in which the student alternates between the school and industry. Twenty-five of Pittsburgh's largest industrial plants are coöperating with the public schools in such work.

Various industrial organizations throughout the country maintain educational courses for their employees. The Henry Ford Trade School is a noteworthy example. It is maintained for boys between 12 and 18 years of age. It reports an enrollment of 1800. Each boy receives at the start \$7.20 per week and in addition \$2 a month for a savings account.

**Continuation Schools or Courses.** Part-time courses that are designed primarily to care for those who are compelled to attend are often called continuation courses. Objections have been made to continuation classes on the ground that employers were unwilling to allow their workers the several hours each week that the law requires. It has been asserted that this attitude on the part of employers has made it difficult and often impossible for worthy young people to secure employment. Those who have charge of continuation work do not deny that this condition exists, but they urge that the difficulty can easily be overcome.

**Vocational Training for Disabled Civilians.** In 1920 Congress provided for civilian vocational rehabilitation. Before this, several States had compensation laws designed to help those who were in economic straits because of accidents in connection with their occupations. There were also various philanthropic organizations that endeavored to aid such unfortunates and to assist them in finding employment. There was, however, no organized plan for training such adults to undertake new work.

(Under the provisions of the law, the Federal Board of Vocational Education is required to coöperate with the various States in "the promotion of vocational rehabilitation of persons disabled in industry or in any legitimate occupation and their return to civil employment." For the year ending June 30, 1926, the total expenditures for civilian rehabilitation were \$1,272,877.30, of which \$578,847.33 was Federal money and \$694,039.97 was supplied by the States. The total number of persons rehabilitated for that year was approximately 5600.

See UNIVERSITIES AND COLLEGES.

**EDWARD, (ALBERT CHRISTIAN GEORGE ANDREW PATRICK DAVID), PRINCE OF WALES (1894- )**. The eldest son of King George V and Queen Mary of England, born at White Lodge, Richmond Park. The Prince began to prepare for the navy when he was eight years old; in 1907, he entered Osborne and in 1909 the Royal Naval College at Dartmouth. Upon becoming a midshipman, he was appointed to H.M.S. *Hindustan*. In October of 1912, he entered Magdalen College, Oxford, but his university career was cut short by the outbreak of the World War.

During the War, he served as aide-de-camp to Sir John French in Flanders and in France, with the Mediterranean Expeditionary Force in Egypt, on the Italian front, and subsequently with the Canadian and Australian forces in France and Belgium. The Prince visited Canada and the United States in 1919, on H.M.S. *Renown*, and in the next year went to New Zealand and Australia by way of the Panama Canal. In 1921 he visited India, and in 1923, made a hasty visit incognito to his ranch in Canada. In 1924 he went to the United States and again to his Canadian ranch. The next year he made a trip of over six months, visiting Africa and South America. In 1926, as President of the British Association for the Advancement of Science, he gave the opening address at its meeting at Oxford. The following year, he and his brother, Prince George, visited Spain in April. In August, accompanied by Prime Minister and Mrs. Baldwin, the two Princes went to Canada to celebrate the sixtieth anniversary of Canada's becoming a Dominion. In September, 1928, the Prince of Wales, accompanied part way by his brother Prince Henry, the Duke of Gloucester, started on a four months' tour of East and South Africa, which was interrupted by the serious illness of King George. On December 2, the Prince left Dar-es-Salaam on H.M.S. *Enterprise*, left her at Brindisi, Italy, for a special train, and reached London on December 11, after a journey of more than 6500 miles accomplished in nine and one-half days. He was appointed one of the six counselors of State to take over the work of the King during his illness. The Prince's career has been characterized by democratic simplicity. In the winter of 1928-29, he called the attention of the country to the condition of unemployed miners and their families by a tour of the mining districts.

**EDWARDS, THE MOST REV. ALFRED GEORGE (1848- )**. An English clergyman, the first Archbishop of Wales, born at Llanymawddwy, and educated at Jesus College, Oxford. He was ordained curate of Llandingat, Carmarthen, in 1874, becoming headmaster of the college, Landover, a year later. He became vicar and rural dean of Carmarthen in 1885, bishop of St. Asaph in 1889, and in 1920, after the disestablishment of the Welsh Church, was created Archbishop of Wales. In that year, he received honorary degrees from Oxford, Cambridge, and Wales. His publications include: *The Church in Wales* (1888), *Commonsense Patriotism* (1894), *Landmarks in Welsh Church History* (1912), and *Memories* (1927).

**EDWARDS, CLARENCE RANSOM (1860- )**. An American soldier, born at Cleveland, Ohio. He was graduated at the United States Military Academy in 1883, and by successive promotions attained the rank of major general and was retired in that grade in December, 1922, after 40 years of service. He participated in the cam-

paigns in the Philippines, serving as adjutant general on General T. W. Lawton's staff in 1899. In 1902 he was made chief of the Bureau of Insular Affairs. In 1912 he returned to regular Army service and during 1915-17 was in command of the United States troops in the Panama Canal Zone. Later, he had charge of the Department of the Northeast, where he organized in 1917 the 26th "Yankee" Division. He was in France during 1917-18 on front-line duty. On his return to the United States, he was assigned to the command of the First Corps area with headquarters in Boston. He received the Croix de Guerre with palm and was made an officer of the Legion of Honor.

**EDWARDS, EDWARD IRVING** (1863- ). A United States Senator, born at Jersey City, N. J., and educated at New York University. He has been connected with the First National Bank of Jersey City since 1882, being president in 1916-25 and later chairman of the board. He was State Comptroller of New Jersey (1911-17), member of the State Senate in 1919 (resigned), and Governor (1920-23). He was a member of the United States Senate for the term 1923-29; but was defeated for reelection.

**EGAN, MAURICE FRANCIS** (1852-1924). An American scholar and diplomat (see Vol. VII). From 1907 until 1918, he was United States Ambassador to Denmark. In addition to publishing *The Ivy Hedge* (1914) and *Ten Years on the German Frontier* (1919), he was a prolific contributor to leading American magazines.

**EGERTON, Eŷ'ér-ton, HUGH EDWARD** (1855-1927). An English historian (see Vol. VII), who was Beit Professor of Colonial History at Oxford (1905-20), and Fellow of All Souls College there. In 1923 he became a member of the International and Colonial Institute. Besides contributing to many historical publications, he wrote vols. iv and ix of the *Cambridge Modern History, British Foreign Policy in Europe* (1917), *British Colonial Policy in the 20th Century* (1922), and *Causes and Character of the American Revolution* (1923).

**EGYPT.** A kingdom in northeastern Africa since Feb. 28, 1922, when the British protectorate terminated. The total area of Egypt proper, including the Libyan Desert, the region between the Nile and the Red Sea, and the Sinai Peninsula, is about 383,000 square miles; but the cultivated and settled area, i.e., the Nile Valley and Delta, is but 13,000 square miles. The population for this section was, by the 1927 census, 14,168,756; this made a density of 1044 per square mile, an increase of 10.6 per cent over the last decennial census. The increase for 1897-1907 was 14.9 per cent. The largest towns had the following populations in 1927: Cairo, 1,059,824 (654,476 in 1907); Alexandria, 570,314 (332,246 in 1907); Port Said, 103,223 (49,884 in 1907); Suez, 35,547; Tanta, 89,712; Mansura, 62,815; Zagazig, 52,815; Asyút, 57,036. The 1917 census showed 11,623,753 Moslems, 850,670 Orthodox Christians (Copts), 47,564 Protestants, 107,531 Roman Catholics, and 59,581 Jews. The country had 238,661 foreigners and 452,263 nomads.

Elementary education is supplied by native schools called *Maktabs*. In 1927-28 the number of these receiving grants-in-aid and under government inspection was 2361, with 205,901 pupils and 5039 teachers; the number of those under immediate direction of the Government was 1719 with a total attendance of 208,787. Of

the latter 277 *maktabs* with 54,226 pupils were under the Ministry of Education. Attendance at 1330 *maktabs* was compulsory. The total number of schools under the control of the provincial councils in 1927, either through direct management or through grants-in-aid was 3899, with 339,999 pupils.

Egypt has besides "*Maktabs*," colleges of medicine, law, engineering, and agriculture, a military institution, special technical schools, secondary schools, higher primary schools, etc. Besides native schools, there are British, American, French, Greek, Italian, and other foreign schools. Much of the native agitation against British rule crystallized about the failure of the British to increase the facilities for education. After 40 years of British domination, it was pointed out, 92 per cent of the men and 99 per cent of the women were still illiterate. The British policy had been directed almost exclusively toward the furtherance of secondary education, and even here the equipment was inadequate. Because of the failure to found a State University, the natives sought instruction at the university of El-Azhar (Cairo), the chief centre of Moslem orthodoxy, and the anti-Occidental spirit which resulted was inevitable.

**Agriculture.** In 1926-27 the cultivable area of Egypt was reckoned at 8,270,788 feddans (1 feddan=1.038 acres), of which 2,052,061 were uncultivated. About 62 per cent of the population is engaged on the land. The cultivation of cotton is the most important single activity; 1,574,000 acres were sown with it in 1927, as compared with 1,743,000 in 1909-13. The yield in 1927 was 1,252,000 bales, averaging 478 pounds net and in 1928 estimated at 1,491,000 bales. The Government frequently has had to take measures to restrict the acreage because of the neglect of food crops. For the years 1921-23, for example, only one-third of each holding could be planted in cotton. In 1927, 1,655,000 acres under wheat yielded 44,346,000 bushels, compared with a yield of 35,731,000 bushels in 1913-14; barley, 376,000 and 11,961,000 bushels (12,050,000 bushels in 1913-14); maize, 19,000 acres; and millet, 262,559. Thus, the food crops steadily declined in the face of the growing cotton culture. In 1929, 49,000 acres were under sugar cane, as compared with 50,000 in 1909-13. In 1913 the sugar export amounted to 5133 metric tons, valued at £79,068, and this increased in 1927 to 25,219 metric tons, valued at \$1,729,000. In 1913, 690,644,548 pounds of raw cotton, valued at \$127,310,414, were exported; in 1927, 731,291,000 pounds, valued at \$194,438,000. To supplement the Assuan Dam for the reclaiming of waste areas, a large irrigation project was developed including the raising of the dam by 6 meters and increasing the capacity of the reservoir from 1,065,000,000 cubic meters to 2,423,000,000 cubic meters. There was a barrage at Isnah, one at Assiout, and also one at Zifta. Further important irrigation work was undertaken and in April, 1927, a contract was signed for the construction of the barrage of Nag Hamadi, midway between the Assiout and Isnah barrages. The object of the barrage was to change the system of irrigation of 500,000 feddans of land west of the Nile from basin to perennial watering, thus doubling or trebling the number of crops per year. Through canalization, it was hoped also perennially to irrigate 115,000 feddans east of the Nile and add 300,000 feddans on the west to basin irri-

gation. The cost of the barrage was estimated at £E1,976,555. The work during 1927 was financed by a budgetary credit of £E250,000, and the budget draft for 1928-29 carried a credit of £E2,250,000 for continuation of the work on the barrage and on the canalization, which was expected to be completed around 1930.

**Mining and Manufacturing.** Principal mineral products in 1927 were, in metric tons, phosphate rock, 279,380; manganese-iron ore, 152,845; petroleum, 1,356,000 barrels. The increase in the last was particularly marked, for up to 1912 petroleum was hardly produced at all. In 1913 the output was only 88,000 barrels. The manufacture of cigarettes, the leading industrial activity, visibly declined after 1913. In 1927 the amount of tobacco imported for the making of Egyptian cigarettes was 14,830,000 pounds, as compared with 18,027,000 in 1913. Imports from China became important during the World War.

**Trade.** For 1913 imports were \$139,047,323; 1920, \$382,053,600; 1921, \$219,256,537; 1922, \$196,736,078; 1927, \$242,729,000. Exports for 1913 were \$157,993,704; 1920, \$320,501,479; 1921, \$143,606,445; 1922, \$221,172,538; 1927, \$243,428,925. The year 1922 was the first to show a normal condition since 1913 and a favorable trade balance was restored. In both 1920 and 1921, there were heavy adverse trade balances, but for 1922 the foreign trade showed a favorable surplus of \$24,436,460; in 1923, \$61,487,711, and in 1928 the favorable balance was \$26,595,335 including reExports. In 1913 this had been about \$19,000,000. Cotton continues in the place of leading prominence, its exports totaling 90 per cent of the entire export trade. Next in importance are cottonseed, refined sugar, cottonseed cake, cigarettes, onions, eggs, etc. Leading imports with value in Egyptian pounds (£E=\$4.9431) in 1928 were cotton and cotton textiles (£E6,484,782); wheat and wheat flour (£E2,158,737), coal (£E1,592,441), tobacco (£E1,358,849), and fertilizers (£E2,320,639). The fluctuations in flour imports showed something of the part cotton played in Egyptian economic life. Imports for 1913 were \$10,000,000; 1920, \$24,000,000; 1921, \$25,000,000; 1922, \$8,000,000; 1928, £E2,158,737. In 1913 Great Britain was the leading country of origin of Egyptian imports; it sent 30.5 per cent of the whole. The United States ranked ninth with 1.9 per cent. In 1927 the proportions were: Great Britain, 21.8 per cent; United States was fifth with 5.2 per cent. The last figures for the United States were a distinct falling off from the 1920 and 1921 proportions of 10.6 and 15.1. Proportions by countries of destination of Egyptian exports were, for 1913, Great Britain, 43.1 per cent, and the United States, 7.8 per cent; for 1927, Great Britain, 39.6 per cent, and the United States, 14.1 per cent. In 1919 and 1920 the United States proportions were 22 and 30 per cent. The American purchases of raw cotton are significant. In 1913, 66,712,453 pounds (\$12,188,240) were purchased; in 1927, 121,462,000 pounds (\$32,472,000). Alexandria handled 90 per cent of the total trade in 1913 and 90 per cent in 1927. Port Said and Suez handled 8.4 per cent in 1913 and 8 per cent in 1927.

**Communications.** No important railroad construction has been accomplished recently except the double tracking of the line from Cairo to Luxor in 1928 and previously the continua-

tion of the line from Salhia to Quantara, which joined with the line across the Sinai Peninsula to Jerusalem by a bridge over the Suez Canal. The bridge was removed in 1921 because it obstructed the Canal traffic. In 1924 a railway 217 miles long was begun, from Kassala to Port Sudan. Total mileage on Apr. 30, 1927, of state-owned railways (single and double track) was 2272 miles. There were also 854 miles of line operated by private companies. A line connecting Benha and Meneuf was completed in 1929. In 1919 the Ministry of Communication took over control of all railway, telephone, telegraph, post-office, port, and lighting facilities. Cairo and Assiut have wireless stations and an airport is located at Cairo.

**Finance.** In 1912 revenues were placed at £E15,900,000 and expenditures at £E15,400,000. During the War, deficits were evident for the first time in the country's financing, the 1914-15 preliminary budget showing an adverse balance of £E1,460,000. The fall in prices during the year left the very large deficit of £E15,800,000. In 1921-22 the accounts had been restored to their normal relationship, with an expenditure of £E37,747,000 and a revenue of £E41,803,000. For the fiscal year 1928-29, the budget estimates were £E37,532,000 revenues and £E41,532,000 expenditures. The reserve fund in 1928 amounted to £E35,000,000. In 1926 the amount of the public debt was £E91,977,000 (\$454,643,000). The 1927-28 budget carried £E4,798,000 for debt service. The National Bank, the bank of issue, had in circulation in January, 1928, notes to the value of £E27,500,000. The gold reserve in January, 1928, was £E3,800,000.

**History.** On Dec. 18, 1914, the empty suzerainty of Turkey was factually terminated when the British Foreign Office declared Egypt a British Protectorate, with Hussein Kamil replacing the Khedive Abbas Hilmi and taking the title of Sultan. Under the high commissionerships of Sir H. McMahon (1915-16), who succeeded Lord Kitchener, and Sir R. Wingate (1916-19) Egypt was put on a war footing. By 1915 some 40,000 British troops had arrived in the country. With the growth of a powerful British bureaucracy, under the new order, the failure of the Legislative Assembly to convene, the cruel treatment of native soldiers, the censorship of opinion, the suppression of native newspapers and of political discussion in the state schools, and finally the heavy requisitions of animals and produce imposed on the fellahin during the War, nationalistic aspirations were increasingly aroused and particularly the educated Egyptians were made restive. Two Nationalist leaders, Zaghlul Pasha and Adli Pasha Yeghen, made repeated but vain efforts to present their case to the British Foreign Office, and when Zaghlul Pasha was deported to Malta on Mar. 9, 1919, on order of the puppet sultan Ahmed Fuad (1917- ), serious disturbances ensued. Even the fellahin, much to the surprise of the British, joined in the disorders, and the Copts lined up with the Musguls. Riots broke out at Cairo and Tanta in March, 1919, and British soldiers, firing into the mobs, killed many. Railway lines were torn up, and Cairo was isolated as a result of the cutting of telegraph wires; Alexandria was the scene of popular disturbances; a British detachment was besieged by fellahin in Assuit; the Arabs were breaking in from the West.



Lord Allenby, appointed as special high commissioner in March, 1919, vainly attempted pacification but was met by a strike of officials at Cairo, with bloodshed again resulting. Zaghlul Pasha, now a popular hero, was permitted to return from Malta but the political strike continued and transportation was broken off. In April, 1919, Rushdi Pasha was invited to form a government once more but after two weeks his ministry, unable to handle the situation, resigned. Meanwhile Zaghlul had repaired to Paris to place his country's case before the Peace Conference; but he was never given a hearing, for President Wilson, on behalf of the United States, had recognized the British Protectorate within a short time of his arrival.

In December, 1919, a British mission headed by Lord Milner arrived in Egypt but was universally boycotted and after four months returned to England. There it negotiated with the Egyptian Paris delegation the so-called Milner-Zaghlul Agreement, providing for the recognition of Egypt as a constitutional monarchy, the right of Great Britain to defend Egyptian territory and maintain an army there, the naming of British financial and judicial advisers, the calling of a constituent assembly, the creation of a legislature, religious toleration, protection of the rights of foreigners, etc.

The agreement, however, was unfavorably received in Egypt and a new ministry, headed by Adli Pasha, selected a delegation to negotiate a new understanding. Zaghlul insisted that certain preliminary conditions should be accepted as a basis for these negotiations, and when they were refused he and his Nationalists opposed the Government and demanded the calling of a Legislative Assembly. Further riots in May, 1921, caused the British to suppress Nationalist newspapers and arrest agitators. The Egyptian delegation met with no success in London and the winter of 1921 saw a renewal of the disorders.

The arrest and removal of Zaghlul Pasha and 56 followers, first to Suez and then to the Seychelles Islands, whence Zaghlul was later transferred to Gibraltar before his release on Mar. 30, 1923, was followed by street fighting and another political strike on the part of government officials, together with the adoption on Jan. 23, 1922, of a policy of passive resistance. The seeming impasse and the visit of Lord Allenby to England to counsel the termination of the protectorate forced the hand of the British government, with the result that in February, 1922, Lloyd George made a unilateral declaration incorporating the termination of the protectorate, the abolition of martial law, security for the communications of the British Empire in Egypt, defense of Egypt against foreign aggression, protection of foreign interests and of minorities in Egypt, and guarantees of British interest in the Sudan. On Feb. 28, 1922, the protectorate was officially terminated; on March 16 the Sultan Ahmed Fuad was officially proclaimed King as Fuad I. On March 14, the English House of Commons approved the Government's Egyptian policy by a vote of 202 to 70. Under Rushdi Pasha, a commission set to work to formulate a constitution.

The new constitution promulgated in May, 1923, after many stormy preliminary sittings of the commission, contained the following provisions: Egypt is declared a sovereign, free, independent state with a hereditary, monarchical, and constitutional government; Islam is estab-

lished as the national religion and Arabic as the official language; compulsory free education for both sexes is assured; legislative power is vested in the King in consultation with the Senate and the Legislative Assembly; the King may declare war and make peace through a cabinet; parliamentary assent is needed for the declaration of offensive war, and all treaties of peace and alliance are ineffective without parliamentary ratification; the ministry is responsible to the Parliament; two-fifths of the senators are renominated by the King, and the remainder are elected; the Assembly is elected by universal manhood suffrage; the rights of the Egyptian Debt Commission and the Capitulations are not to be affected by legislation. Representation of racial minorities, greater freedom for women, the predominant position claimed by England in regard to Egyptian foreign relations and the military protection of the Suez Canal, all points of sharp contention, were not included in the constitution, nor was the question of the Sudan settled.

The Zaghlulists continued in opposition because of the failure of the constitution to incorporate a bill of rights. The unsettled internal affairs led to frequent changes of ministries. Sariyat Pasha resigned on Nov. 30, 1922, after holding office since March 1. Tewfik Nessim Pasha, his successor, was compelled to resign on Feb. 5, 1923, because of his willingness to relinquish the Egyptian claim to the Sudan. After a month of political bargaining, a new ministry was formed by Yehia Ibrahim Pasha on March 15. The turbulence in politics indicated with what dissatisfaction Egyptians still looked on the settlement. Feminism and a rampant nationalism which would accept nothing but complete independence were the order of the day, and rioting and outrages were only too frequent. The Egyptian government patterned an ineffectual attempt at retaliation after the methods of the British administration and instituted a rigorous censorship on May 31. The return of Zaghlul and the renewed activities of his executive committee made the campaign preceding the preliminary elections of September 27 bitter. Zaghlul's programme called only for Egyptian independence, and the wholehearted support which his party received showed how thoroughly the country, especially the rural districts, subscribed to the sentiment. As a result of the balloting conducted in September, November, and January, 1924, the Nationalist Party was returned with an extraordinary majority, 176 seats out of a total of 214. On January 17 Yehia Pasha resigned; and on January 28, Zaghlul, the outcast and political exile, saw his work crowned with success by the offer of the Premiership. He at once accepted, and in the first days of February he was installed in office amid great rejoicings. One of his first acts was to interrupt Howard Carter's excavations at the tomb of Tutankhamen (q.v.) and to put the work under the control of the Egyptian Department of Antiquities. In December, 1924, Howard Carter signed a contract to resume his work in 1925. See ARCHEOLOGY.

Consistent with his past record, Zaghlul proceeded at once to attempt realization of his programme, which was nothing less than the complete independence of Egypt, in domestic and foreign affairs alike, and recognition of the Sudan as an integral part of the country. But Ramsay MacDonald, the new Labor Prime

Minister of Great Britain, disappointed him by adhering to the policy of his predecessors. The primary object of that policy was the protection of the Suez Canal and the route to the East; but the dispute came to centre around control of the Sudan. The Egyptian Nationalists insisted that the Sudan was historically a part of their country, and that control of the waters of the Upper Nile meant control of the whole life of Egypt. This latter undeniable fact lay also at the bottom of the British determination to retain authority in the Sudan.

The Egyptian Parliament met on Mar. 15, 1924, and was almost unanimous in support of the Premier. In October, Zaghlul Pasha visited England to confer with Mr. MacDonald, but the two viewpoints proved irreconcilable and he returned with nothing accomplished. Shortly after his return, a band of conspirators, on November 19, assassinated Sir Lee Stack, Governor General of the Sudan and Sirdar of the Egyptian army, in Cairo. The reaction of the British government was swift and stern. Although the Egyptian authorities promptly disclaimed any connection with the outrage, Lord Allenby on November 22 presented to them an ultimatum from London demanding that the Egyptian government should (1) present an ample apology for the crime; (2) seek out and severely punish the criminals; (3) energetically put down all popular political demonstrations; (4) pay the British government immediately £500,000; (5) withdraw at once all Egyptian officers and purely Egyptian units of troops from the Sudan; (6) give notice that the area to be irrigated at Gezira was to be increased by the Sudan government from 300,000 feddans to an unlimited amount; (7) withdraw opposition to any measures the British might want to take for the protection of foreign interests in Egypt.

The Egyptian cabinet consented to the first four but refused assent to the Sudanese demands and temporized on the seventh. The British thereupon ordered the Sudan government to put the military and irrigation provisions into effect, and occupied the customs house at Alexandria. Zaghlul immediately resigned and a new Cabinet of moderates, headed by Ziwar Pasha, was sworn in and acceded to all the British demands. The Egyptian government appealed, without avail, to the League of Nations. On December 10, the British Foreign Office warned the Powers that the matter was purely a domestic one. The Egyptian Parliament was dissolved December 22 and elections ordered for early in 1925. They were held in March and resulted in a decisive indorsement of the Zaghlul party. When the new Parliament organized, by electing Zaghlul president of the Chamber, it was promptly dissolved and the Cabinet ruled for the rest of the year alone. The resignation of Lord Allenby and the succession of Sir George Lloyd were declared to be without political significance. A threatening dispute with Italy arose when the Egyptian government objected to the cession of the oasis of Jarabub, in fulfillment of a British promise of 1919, but the Italian claims were eventually conceded.

In the elections of May, 1926, the Zaghlulists were again overwhelmingly victorious. But Zaghlul was barred from the leadership by the British, and Adli Pasha formed a government, Zaghlul being again elected president of the Chamber. For a while, comparative political quiet prevailed, the Government occupying itself

with internal problems such as government economy, regulation of Nile waters, and restriction on cotton growing. An agreement was reached as to the amount of water that might safely be diverted for Sudan irrigation. On December 8, a law was passed limiting cotton acreage for three years to about one-third the 1920 area.

Among the non-political events in 1926 were the Caliphate Congress held in Cairo in May without decisive results, and the rejected offer by John D. Rockefeller, Jr., of \$10,000,000 for a museum to house Egyptian antiquities. In April, 1927, the extremists of the Wafd, or Zaghlul Nationalists, forced the resignation of Premier Adli and only Zaghlul's intervention prevented the overthrow also of his successor, Sarwat Pasha. When a Parliamentary committee recommended measures lessening British control the British government objected in a note, reinforced by battleships, and the Egyptians yielded.

King Fuad and Premier Sarwat visited London in July. On August 23, Nationalist aspirations received a severe blow in the death of Zaghlul, soul of the independence movement, at the age of 70. But his passing did not mean a cessation of the activities of his party. Mustapha Nahas Pasha took over the leadership, and on Mar. 16, 1928, became Prime Minister when Sarwat Pasha resigned, because of opposition to a proposed treaty with Great Britain providing, among other things, for stationing a British Army in Egypt for ten years, support of Great Britain by Egypt in case of war, British control of Egypt's foreign relations, etc. When this treaty was definitely rejected, the British government demanded that certain pending bills relating to public assemblies, election of village headmen, and the right to bear arms should not be passed, and when the Egyptians protested against this interference in their internal affairs, the British made the point that sovereignty in internal affairs could be exercised only when it did not conflict with British interests. Warships were sent and armed intervention was averted only by postponing action on the bills.

In June, 1928, Mustapha Nahas Pasha was dismissed by the King for personal irregularities and Mahmud Pasha succeeded him on June 27. On July 19 the King and the new Prime Minister took the drastic action of dissolving Parliament and suspending the constitution for three years. There was much protest by the Wafd, but the public seemed not dissatisfied. On Jan. 24, 1929, it was announced that Egypt had ratified the Kellogg anti-war treaty, and on February 16 that she would put into effect a new customs tariff at the end of one year. On March 21, a royal decree provided for the punishment of anyone inciting hostility to the existing régime or participating in prohibited demonstrations. In July, announcement was made in the British Parliament of the retirement of Lord Lloyd as High Commissioner for Egypt. In the middle of the year press reports described an agreement between Great Britain and Egypt relating to control of the Nile waters. It provided for the heightening of the Assuan Dam and the building of a new dam at Jebel Aulia, surveys for a dam where the Nile emerges from Albert Nyanza, and a canal through the region of the Sudd.

**EIGHT-HOUR DAY.** See HOURS OF LABOR.

**EIGHT-HOUR LAW.** See LABOR ARBITRATION.

**EINHORN, MAX** (1862- ). An American physician and pioneer in gastroenterology, born in Grodno, Russia. After graduation from the gymnasium at Riga, he received the degree of M.D. from the University of Berlin in 1884, migrating shortly afterward to the United States. He was made professor of medicine in the New York Postgraduate School and Hospital in 1888. As a gastroenterologist, he has devised many new forms of apparatus for diagnostic or therapeutic work, which are known by his name. In addition to contributions to periodical literature, he has written several standard textbooks: *Diseases of the Stomach* (1896); *Diseases of the Intestines* (1900); *Practical Problems of Diet and Nutrition* (1905); *Lectures on Dietetics* (1914); *The Duodenal Tube* (1920, 2d ed., 1926; German transl. 1924).

**EINSTEIN, ALBERT** (1879- ). A great German-Swiss physicist and author of the special and general theories of Relativity (see RELATIVITY), born at Ulm, Württemberg. Einstein spent his youth in Munich, where his father controlled electro-technical works. He studied at the University of Zurich and supported himself by teaching at the Technische Hochschule. Einstein's next few years were years of painful struggle and gradual advancement. Tutor at Schaffhausen from 1900-01, he returned to Zurich for a year, and then became examiner of patents at the federal patent office in Berne. It was while earning his living as a government employee that Einstein published a paper on the "Electrodynamics of moving bodies" describing his special theory of relativity as a solution for the paradoxes of the Michelson-Morley experiment (1905). This theory embraced at the time only the interrelationships of space and time measurements, and it was while working out the problems and implications set by this theory that Einstein was led in 1916 to generalize his conception so as to include gravitational phenomena, and subsequently electromagnetism as well. In the meantime, having become a Swiss citizen, Einstein was called in 1909 to teach at the University of Zurich, and in 1911, to the University of Prague. The next year, however, he returned to the Technische Hochschule in Zurich with the title of full professor. By this time, Einstein's reputation had spread throughout the scientific world, and in 1913 he was invited to lecture before the Prussian Academy of Science. The next year, he received a research professorship without restrictions from the Kaiser Wilhelm Institut für Physik and the University of Berlin.

The outbreak of the World War found Einstein formulating specifically the general theory of relativity and indicating certain empirical tests. A revision of the complicated mathematical calculations enabled the theory in 1919 to account for the displacement of the perihelion of Mercury within 1 second of actual observations, where the theory of Newton had left a discrepancy of 42 seconds. The eclipse of the sun in May, 1919, as observed in Brazil, also confirmed the deflection of the sun's rays in the neighborhood of the solar mass as predicted by the theory. Einstein now leaped into world fame overnight, and was saluted as the greatest physicist since Newton. He visited England, the United States, Italy, and France, and in each country received great ovations and honors. On his return to Germany, Einstein busied himself with the problems of the quantum

theory of radiation, upon which he had published papers dating back to 1907. The phenomena covered by this theory concern the behavior of sub-atomic masses and at that time were considered outside the range of the relativity principle which provides continuous and invariant equations for systems of large masses. Quanta formed therefore the next objective of the Relativity theory, but it seemed to many scientists doubtful whether the Einsteinian principle could be extended to such phenomena without considerable modification. In 1929 Einstein published his remarkable work, *Zur Einheitlichen Feldtheorie*, giving unified field laws for gravitation and electromagnetism. This completed the unification of all fields involved in natural phenomena. In his extra-scientific life, Einstein was a fairly typical European intellectual. In politics, he was a liberal with socialist sympathies. During the period of political effervescence in Germany, he suffered from persecution at the hands of reactionary and anti-Semitic partisans, and threats against his life were reported. While he was in the United States, he took a public interest in the activities of Jewish Zionists.

Einstein's other published works include, in addition to numerous papers contributed to learned periodicals, the following books: *The Special and General Theory of Relativity* (Eng. trans., 1920); *Sidelights on Relativity* (Eng. trans., 1922); *The Meaning of Relativity* (containing the Princeton lectures delivered 1921); *The Principle of Relativity* (a collection of essays by Einstein and others, 1923); *Untersuchungen über die Theorie der "Brownschen Bewegung"* (1922). See PHYSICS; RELATIVITY.

**EINSTEIN, LEWIS** (1877- ). An American diplomat and author, born in New York, and educated at Columbia University. His first diplomatic post was as third secretary at the American Embassy in Paris (1903-05), and since that time he has been at the embassies of: London (1905-06); Constantinople (1906 and 1908); Peking, China (1909); Costa Rica (1911-13), as envoy extraordinary and minister plenipotentiary; Constantinople (1915), as special agent of the State Department; Bulgaria (1915-16), as American diplomatic representative in charge of British interests; and Czechoslovakia (1921- ), as envoy extraordinary and minister plenipotentiary. His works include: *Luigi Pulci and the Morgante Maggiore* (1902); *The Relation of Literature to History* (1903); *American Foreign Policy by a Diplomatist* (1909); *Inside Constantinople* (1917); *Prophecy of the War*; *Tudor Ideals* (1921); "Lewis Cass and American Diplomacy Under President Buchanan" (in *Lives of Secretaries of State*, 1927).

**EINTHOVEN, WILLEM** (1860-1927). A Dutch physiologist, born in Java and educated at the University of Utrecht, where he was assistant to the well-known physicists, Donders and Snellen. He was professor of physiology in the University of Leyden (1886-1927). His most notable achievement was the invention of the string galvanometer by means of which it became possible to register the numerous variations of the heart beat. For this, he received the Nobel Prize for Medicine in 1924. In the same year, he visited and lectured in the United States.

**EISELEN, FREDERICK CARL** (1872- ). An American seminary president and Methodist

Episcopal clergyman, born at Mundelsheim, Germany, and educated at the gymnasium in Landsberg, Germany, at New York University, Drew Theological Seminary, the University of Pennsylvania, Columbia University, and the University of Berlin. In 1902 he was appointed professor of Semitic languages at the Garrett Biblical Institute, Evanston, Ill., served as dean, 1919-24, and as president after 1924. He was professor of Biblical literature in Northwestern University, 1918-24. He is the author of: *Sidon—A study in Oriental History* (1907); *A Commentary on the Minor Prophets* (1907); *Prophecy and the Prophets* (1909); *The Worker and his Bible* (1909); *The Christian View of the Old Testament* (1912); *Books of the Pentateuch* (1916); *The Psalms and Other Sacred Writings* (1918); *The Prophetic Books of the Old Testament* (1923).

**EISELSBERG, ANTON, BARON VON** (1860- ). An Austrian surgeon, born at Steinhaus. He received his medical degree from the University of Vienna and was professor of surgery in the Universities of Utrecht (1893-96), Königsberg (1896-1901), and Vienna (1901- ). His only considerable work was *Krankheiten der Schilddrüse* (1901). In 1918 appeared his "Festschrift" which comprised vol. ex of the *Archives für klinische Chirurgie*, of which he is co-editor, and was made up wholly of papers by numerous prominent surgeons who were formerly his pupils.

**EISNER, Pzner, KURT** (1867-1919). A German Socialist and publicist, born in Berlin. He became a journalist, and was many times imprisoned on account of the extreme radical character of his writings. From 1898 to 1905, he was a member of the editorial staff of *Vorwärts* in Berlin; he was subsequently on Socialist papers in Nürnberg and Munich. During the World War, he turned against his party because it supported the War, and in 1918 was charged with treason at Munich for inciting munitions workers to strike, but he was released. On November 7 of the same year, he held a mass meeting in Munich which led to the overthrow of the Bavarian monarchy and the creation of a revolutionary government with Eisner as president. His policy was extreme. He supported the Workmen's and Soldiers' Councils, and was opposed to the centralizing policy of the Berlin government. He finally agreed, however, to the reestablishment of the federal system and the election of a National Constituent Assembly. But in the meantime, a Bavarian Assembly had been elected. This fortified the fears of the reactionaries and as he was going to open the Assembly on Feb. 21, 1919, he was assassinated by Count Arno, and Munich was plunged for a time into a state of Bolshevism. See **BAVARIA**.

**ELECTRIC AUTOMOBILES AND TRUCKS.** See **MOTOR VEHICLES**.

**ELECTRIC BOILERS.** See **BOILERS**.

**ELECTRIC DRIVE.** See **SHIPBUILDING**.

**ELECTRIC FURNACES.** A new type of furnace has come into general application so that now we have four types recognized: resistance, arc, induction, and coreless or high frequency.

The resistance type furnace employs a conductor of high resistance metal, such as nichrome or calorite as used in household heating appliances, maintained at a high temperature by current, either direct or (more generally) alternating. A usual size is designed for 1500

pounds of brass with 300 kilowatts. Temperature up to 1800° F. may be obtained.

Arc furnaces, particularly for steel, have developed rapidly in design and application. Alternating currents are more convenient because a transformer may be used for the supply instead of a motor-generator set. Single-phase furnaces are available, but, particularly in large sizes, the three-phase ones are preferable from the viewpoint of the balanced supply. A notable example of an arc furnace is that of the United States Naval Ordnance plant which holds 40 tons of steel and takes 3300 kilowatts, normally in the form of three-phase currents at 110 volts, with a maximum current of 21,200 amperes per phase. In the industries, three-phase furnaces of a rating as high as 20,000 kilovolt-amperes have been installed.

The induction furnace as used primarily for copper, brass, etc., is constructed like a transformer, using the metal to be melted as a short-circuited secondary and works at normal power frequencies. Sizes range up to 300 kilowatts. The repulsion-induction furnace is a special form in which the secondary is so placed that the leakage flux keeps the molten metal flowing by the eddy currents induced in it. The "core-loss," or high-frequency-induction furnace is for ferrous materials. The materials to be melted occupy the place usually assigned to the magnetic iron core in a transformer and are heated due to excessive eddy currents and core loss set up in them by the high frequency, usually from 500 to 2000 cycles per second, but sometimes as high as 12,000. The lower frequencies are supplied by motor-generator sets and the higher frequencies by oscillating tube sets. Consult N. R. Stansel, "Industrial Electric Heating" in *General Electric Review*.

**ELECTRIC GENERATORS.** See **ELECTRIC POWER STATIONS AND GENERATING APPARATUS; STEAM ENGINES AND TURBINES**.

**ELECTRICITY, THEORIES OF.** See **CHEMISTRY; PHYSICS**.

**ELECTRIC LIGHT AND POWER.** See **MUNICIPAL OWNERSHIP**.

**ELECTRIC LIGHTING.** The more striking achievements in the field of electric lighting since 1914 have been: the great improvement in the efficiency of the incandescent lamp and the increase in the intensity of illumination used in general practice. In this period, the old favorites, the carbon lamp and the metallized-filament lamp, have practically disappeared from the market, and the tungsten-filament lamp reigns supreme among incandescent lamps and also has superseded the arc lamp in new installations except for display effects. In 1919 the manufacture of the metallized-filament lamp was abandoned, and in 1927 only 4 per cent of the lamps made were of the carbon-filament type, the remainder were tungsten lamps. During 1928 a total of 312,000,000 large tungsten-filament lamps were sold in the United States, an increase of 2.3 per cent over the previous year, and 9,900,000 large carbon lamps, a decrease of 21.4 per cent from 1927. Of the carbon lamps, 77 per cent were imported and were distributed largely through chain stores.

These lamps, known to the trade as Mazda, now are made in two styles. In one, the Mazda B lamp gives 8 to 12 lumens per watt, in the C type, the bulb is filled with an inert gas such as nitrogen, or, more recently, argon. The B lamp is about three times as efficient as the

old carbon lamp, and the C lamp about four times as efficient. The C lamp was at first made only in the largest sizes; later it was made in all but the smallest standard sizes.

In keeping with the policy of reducing costs by standardization, these lamps now are made in only a few sizes, i.e., 15, 25, 40, 50, 60, and 100 watts of which the 50 watt and larger are of the gas-filled type. The number of standard voltages has been reduced so that 94 per cent of the lamps sold are for one of the three voltages, 110, 115, and 120, and 59 per cent are for 115 volts. The spherical-shaped, tipless lamp with inside frosting has also been standardized because this inside frosting reduces its efficiency so little that it may be used with success where either clear or frosted bulbs are called for. The outside frosted lamp was less translucent itself and accumulated dirt which rendered it still less efficient or required frequent washing. Along with these improvements, the selling price of the lamps has been reduced to 50 per cent of the price prevailing in 1914.

On account of the changes in the shape of the filament and in the distribution of the direction of the light from these newer lamps, it is no longer possible to compare lamps by candle power, which is an intensity in a definite direction. Therefore, the illuminating engineer has adopted a definite *quantity* of light as the standard of comparison and has called it the lumen. A lumen is most easily understood as the amount of light that would fall on a sheet of paper one foot square placed so that all parts of it were just one foot distant from a candle of one candle power. The paper would then be illuminated with an intensity called *one foot-candle*. Thus, lamps are now sold on the basis of the light they give in all directions instead of in only one direction, as formerly. A point source of light of one candle power gives 12.56 lumens. The average Mazda B lamp gives 8 to 12 lumens per watt, and the Mazda C from 12 to 18 lumens per watt. The old carbon lamp gave about 3.4 lumens per watt. Statistics show the growth of the use of large incandescent lamps and the improvement in their efficiency:

	1913	1927
Total lamps sold in year	105,000,000	315,000,000
Aggregate wattage	4,700,000,000	18,600,000,000
Aggregate lumens	29,500,000,000	233,000,000,000
Average lumen per watt	6.3	13.5

The effect of this improvement on the pocket-book of the consumer is demonstrated by the total expenditure for electric lighting in the United States in 1927; this was \$1,000,000,000 with the new high-efficiency lamp. If lamps of the low-efficiency type common 15 years ago had been used the bill would have been three times as much. The improvement of the incandescent lamp in the last 15 years means a saving of \$2,000,000,000 per year to the users. New York City alone pays a bill of \$4,000,000 annually for current for lighting its 2800 miles of streets.

Scientific measurements of the prevailing intensities of artificial illumination and of the most desirable intensities have shown that a very great increase is desirable, profitable, and, in some cases, necessary to the preservation of the eyesight of the nation. Thus, in schoolrooms, an illumination of three foot-candles used to be considered good, but now eight foot-candles is recommended. Investigations in the industries

have shown that by multiplying prevailing intensities three times, the production of a factory may be increased 20 per cent. There is also a very close relation between industrial accidents and quality of illumination, and it is accepted that an increase in intensity in dangerous locations very definitely decreases the chances of accidents to industrial workers.

The Illuminating Engineering Society developed a Code of Standard Practice in Illumination which has had a beneficial effect in improving methods, and several States have adopted codes for the regulation of the illumination of factories, streets, schools, etc. A great deal of scientific work was done on the design of fixtures for incandescent lamps, and the name "luminaire" was officially given to such devices. The main requirements are to direct the light uniformly in a desired way (downward) and to eliminate glare. Enclosed luminaires are now the usual practice, and some sort of reflecting surface above or inside the luminaire is used to throw the light downward where it is usually desired and most needed. In the scientific study of illumination, new measuring devices have been developed and various forms of illuminometers are in use. The foot-candle meter is a simple commercial device by which any person may determine the intensity of illumination at any given point, in foot-candles, as easily as he may tell time by looking at a clock.

While the tungsten-filament lamp is much richer in blue and green than the older types of lamps, it still falls far short of daylight in its color content. The gas-filled, or C, type is better than the vacuum lamp on account of the higher temperature of its filament. To overcome the defect in color, a special lamp is manufactured in which the bulb is tinted a bluish-green, which absorbs the excess of red and yellow of the filament and thus gives a reduced amount of light with a better distribution of colors. This is known as the daylight lamp. By means of outside screens, a real reproduction of daylight may be obtained with this lamp. This is found useful in matching colored cloths, and physicians employ it in examinations of inflamed internal membranes, as in the nose and throat.

To facilitate the making of moving pictures at night with better color effect than that given by the mercury lamp, a very large size of tungsten incandescent lamp has been developed which takes 30,000 watts, 1000 times as much as the usual lamp in the home; it gives a proportionate quantity of light. The high intensity gas-filled lamp has been adapted, by giving the filament a special shape which approximates a point source, to use in stereopticons and moving-picture machines for projection purposes. It is rapidly superseding the arc lamp on account of the reduced fire hazard.

The improvement in street lighting has been marked, both in intensity and in artistic effect. Artistic poles and luminaires are now the rule instead of the exception and the various cities are competing for the reputation of having the finest lighted main street. In 1923 Chicago stood first with 2000 lumens per linear foot of street, while the average of good practice is from 500 to 800 lumens per foot.

Electric signs add much to the street illumination and the show effect. New York City is said to have electric advertising signs aggregating 25 million candle power. The lighting of airports and airways has received much atten-



tion. The boundaries of airports are now defined by special low-intensity luminaires, the field is illuminated by flood lights, and the routes are marked by high-intensity beacon lights every 10 miles.

A special study of home lighting has been made, many standard lay-outs have been produced, so that good illumination may be had in a large number of artistic settings. Many public utility companies maintain show-rooms for the education of the householder so that good illumination may be had in the home without sacrificing artistic or aesthetic tastes. Many of these have a distinctly modernistic trend in their artistic effect.

The neon gas-tube lamp without filament has been quite widely applied for sign and display lighting. These operate with alternating current at a fairly high voltage and are very economical in power consumption. Various colors are obtained by a choice of mixtures of gases. The hot-cathode neon lamp is a still later development. It gives a very brilliant light and operates on a 115 volt circuit with either direct or alternating current.

The realization of the importance of the ultra-violet light in sunlight to the health of the human body has led to the introduction of several sources of "artificial sun-light," that is, a light rich in the ultra-violet rays. The mercury arc in quartz tube is the most noteworthy of these. It gives a radiation having a wavelength from 220 to 320 millimicrons. Iron arcs also give these radiations and carbon arcs to a lesser degree. Used without knowledge, such devices often are dangerous.

The photoelectric cell has been very greatly improved in sensitiveness and size and is now a practical commercial device used in broadcasting television, in sound reproduction, talking movies, and in photometry. The later tendency is to use cesium rather than potassium as the light-sensitive metal. This is now applied to analyze the color of a source of light in an electrical device which serves as an automatic recording spectro-photometer.

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**ELECTRIC MOTORS IN INDUSTRY.** The steel mills of the United States gradually have been replacing their steam and gas engines with electric motors, even for driving the largest reversing rolling mills, which is the most difficult service to be provided in such plants. These are generally driven by direct-connected, direct-current motors receiving power from fly-wheel motor-generator sets which vary the voltage impressed upon the mill motor according to the Ward-Leonard system. The largest direct-current, mill motor is of 7000 horse power at 40 to 80 revolutions per minute. Many installations of three-phase, alternating-current, induction motors also have been made, even in still larger sizes. In case variable speed is required, the Scherbius system of speed control is used. In this, a large, induction motor is used to drive the load, and its secondary electric circuits are connected to a polyphase, alternating-current, commutator motor, which in turn drives an induction generator connected to the same

electric mains as the principal motor. By electrical control of the commutator motor, it is made to take more power from the secondary of the load motor, which therefore decreases in speed. This power is returned to the line by the induction generator. By adjusting the power taken by the commutator motor, the speed of the main induction motor may be controlled through a wide range without wasting the energy as would be done with rheostats.

There has been developed a scheme of automatic control of the speeds of all of the motors driving the various parts of a rolling mill so that the whole operation is automatic and in the hands of one man. Automatic control has been applied also to many large installations of one or more motors, as in paper mills, so that the operator has merely to press one button to start and another button to stop the whole machine. Considerable attention has been given to the "capacitor" type of single-phase induction motor, which gives a good starting torque and has a good power factor as a result of the use of an electric condenser.

**Mining.** The mining industry has shown a notable trend toward the substitution of electrical machinery for steam engines and the use of purchased power instead of isolated plants. An average of 40,000 horse power of new electrical motors has been installed annually, of which about 80 per cent was for operation on alternating currents. The mining industry is the third largest customer of the central stations. Mine hoists are the largest factor in size of motor and in power demand. Mining locomotives have increased in size to 35 tons and are now made with electro-pneumatic control, air brakes, dynamic braking, and all equipment sealed in to protect it from moisture and to reduce the danger of mine explosions. The Bingham Mine in Utah has changed to the use of electric shovels and electric locomotives. The bituminous coal mines are now using mechanical loading of the cars. A new double-filament incandescent lamp has been developed for the miner's cap, giving increased illumination and a reserve for reliability. The U. S. Bureau of Mines has issued a list of "Permissible Equipment" advising mine operators of equipment of various manufacturers which has been tested by the Bureau of Mines and been found satisfactory and safe for operation in mines.

**Mine Hoists.** All new hoists are electrically driven, and many old steam-driven hoists are being changed over to electric. Installations are of three kinds:

(a) Direct drive of the hoist by a large three-phase induction motor taking power from the supply lines. This is the simplest and cheapest arrangement, but puts a variable load on the electrical system. An example is that of the Tennessee Coal and Iron Company at Muscoda, Ala., in which an 1800-h.p., 2200-volt, three-phase motor superseded a steam engine in hoisting a load of 27,000 pounds up a slope of 5000 feet at a speed of 2700 feet per minute. For lowering, the motor is reversed electrically.

(b) A direct-current motor is used to drive the hoist, and this is supplied from an alternating-current, direct-current motor-generator set operating on the Ward-Leonard system, by which the control of the speed is most conveniently and economically accomplished. The set has a three-phase synchronous motor, which by

its good power factor assists in the voltage regulation of the distribution system. For example, the Vandalia Coal Company of Indiana has a number of such sets in which an 800-h.p., 500-volt, direct-current motor drives the hoist through gearing, and this motor receives its power from a motor-generator set having a synchronous motor operating from the alternating-current supply lines and driving a suitable direct-current generator. By changing the field current of this generator, the speed of the hoist motor is regulated. The 3200-h.p. motor operating on direct current at 79 revolutions per minute for the International Nickel Company is the largest of this type.

(c) The Ilgner-Ward-Leonard system, in which the motor-generator set contains an induction motor, a fly-wheel, and a direct-current generator. A speed controller so regulates the set as to cause it to take a fairly uniform amount of power from the supply lines while delivering a very variable power to the hoist motor. An example is the Cleveland Cliffs Mining Company of Michigan. The duty is to raise 12,000 pounds of iron ore per trip, up a lift of 2700 feet at a speed of 1800 feet per minute. One 900-h.p., direct-current motor drives the hoist and is supplied by a motor-generator set having a 30-ton fly wheel. The hoist motor takes, at most, 1700 h.p. from the set, a large part of which is supplied by the flywheel, so that the peak demand on the supply lines is only 960 horsepower.

The very general application of electric motors to hoists, cranes, loaders, etc., has resulted in important changes in the design and a great development in the machinery and its application. These devices have been built in much larger sizes than previously. One example of the magnitude which such apparatus has reached is the Baltimore & Ohio coal loader at Curtis Bay, Md., near Baltimore. This loader will unload 8000 tons of coal per hour from coal cars and deliver it to the hold of a ship at a somewhat slower rate. The coal is conveyed along the pier by eight parallel belts driven by electric motors, all controlled by one operator on the bridge of the pier. The coal is transferred automatically to transverse belts which drop it into the vessel alongside the pier. To fill the spaces between the hatches in the hold of the vessel, a trimmer is used. This trimmer throws the coal a distance of 50 feet, if necessary, and each trimmer handles 100 tons per hour. By this means, a vessel has been loaded with 9500 tons in 9.5 hours; this task would have required 200 men for 25 hours if hand trimming had been used.

**Electric Cranes.** Electric cranes are being built in very large sizes, as well as small, and are equipped with alternating-current motors or direct-current motors specially adapted for the purpose. An electric crane of unusual magnitude has been built for service in a shipyard. It has a maximum height of 230 feet, a length of boom of 300 feet and a hoist of 170 feet. It is capable of lifting loads of 350 tons. Several motors aggregating 300 horsepower are used for the various movements, all controlled from a central point. The electric car loader is a type of crane which will pick up a whole freight car and either dump its contents (as coal or grain) into the hold of a vessel or will lower the car itself into the vessel. An example of the former is that of the Baltimore & Ohio

R. R. at Baltimore, and of the latter, the equipment at New Orleans and Havana for loading complete refrigerator cars in and out of vessels. This will lift a 165-ton car at 50 feet per minute and uses two 250-h.p. motors for lifting.

**Electric Shovel.** Electric shovels are replacing the familiar steam shovels and are built in larger sizes than the steam shovels. A large-sized shovel is rated at 300 tons, has a bucket capacity of 8 cubic yards, and can be filled and emptied in 45 seconds. One man controls all the operations by means of two controllers, one for each hand, and foot pedals. It contains four direct-current motors for working, aggregating from 500 to 600 h.p. These direct-current motors are supplied by a motor-generator set in the cab consisting of a three-phase, alternating-current-synchronous motor for 4000 volts driving a 250-volt direct-current generator of suitable capacity. Electric shovels have been built to handle 12 cubic yards and there has been constructed a shovel for 15 cubic yards. This weighs 1350 tons, has two 450-h.p. motors for hoisting and a radius of action of boom of 100 feet.

**Electric Drills.** The enormous activity in the oil industry made it worth while to develop a standard electric-driven drill in which it is possible to use a three-phase alternating-current motor of from 50 to 100 h.p. to drive the drill by means of gearing and chain drive. The motor can take power from a cheaply installed transmission line tapping a main transmission system.

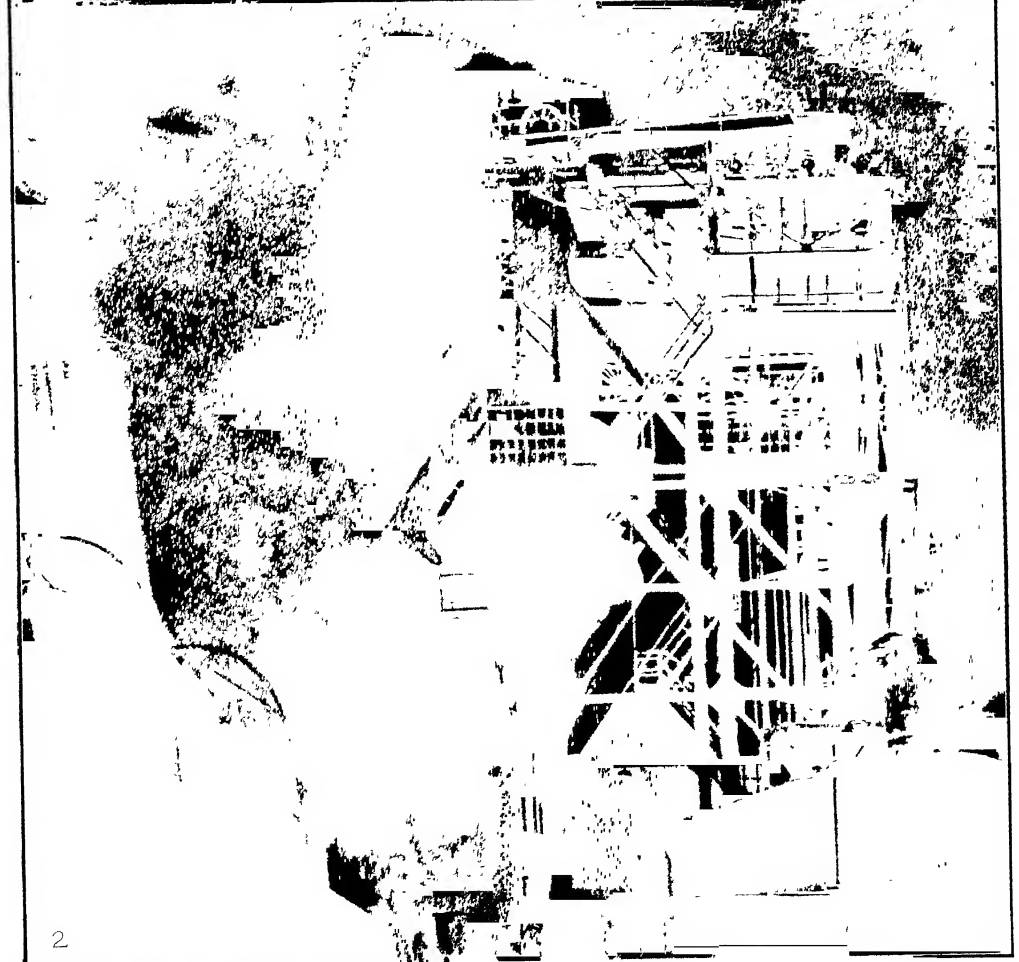
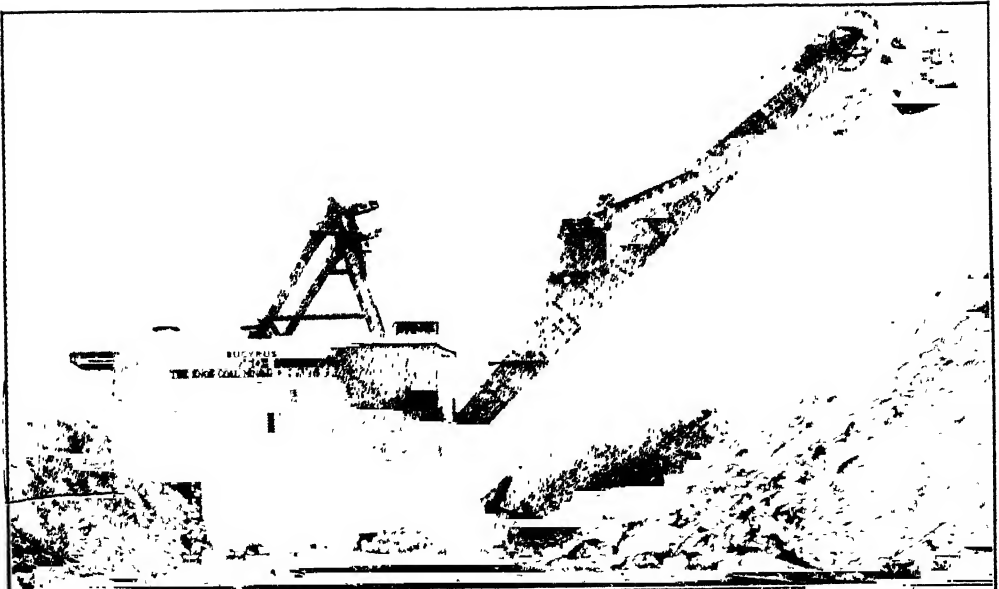
**Brush-shifting Motor.** A new adjustable-speed polyphase motor was brought out, known as the brush-shifting motor, in which the speed may be nicely controlled within a wide range by shifting the brushes. Its most general application was for blowers in power plants.

**Clock Motor.** An interesting development was the clock motor, a small synchronous motor for actuating clocks. It is connected with the alternating current mains of a central station in a customer's house, and as the frequency of the system is kept constant the clock runs at constant speed and repeats the time of a master clock in the power house. Averaged over 24 hours it will keep excellent time, but it may run a second to the minute fast or slow for short periods. In a form now used, the moving part is a disc of aluminium, as in a watt-hour meter, but this disc has small steel studs punched into it. These give it the synchronous tendency.

**Position Indicator.** The position indicator is a repeater which has had an important application on shipboard. It consists of one master and several repeater synchronous motors whose fields are supplied with single-phase alternating current and whose three-phase stators are connected in multiple and located at distant points. At whatever point in its angular position the master is set, the several repeaters will show accurately, and if the circuit is broken and re-established the repeaters will adjust themselves correctly. It is used in the control of the locks of the Panama Canal to indicate to the chief operator the position of each lock and it is being generally applied in the industry in connection with the remote control of apparatus and machinery.

**ELECTRIC POWER STATIONS AND GENERATING APPARATUS.** The business of the electric central stations has been increasing at such a rate that in the United States the

## ELECTRIC MOTORS IN INDUSTRY



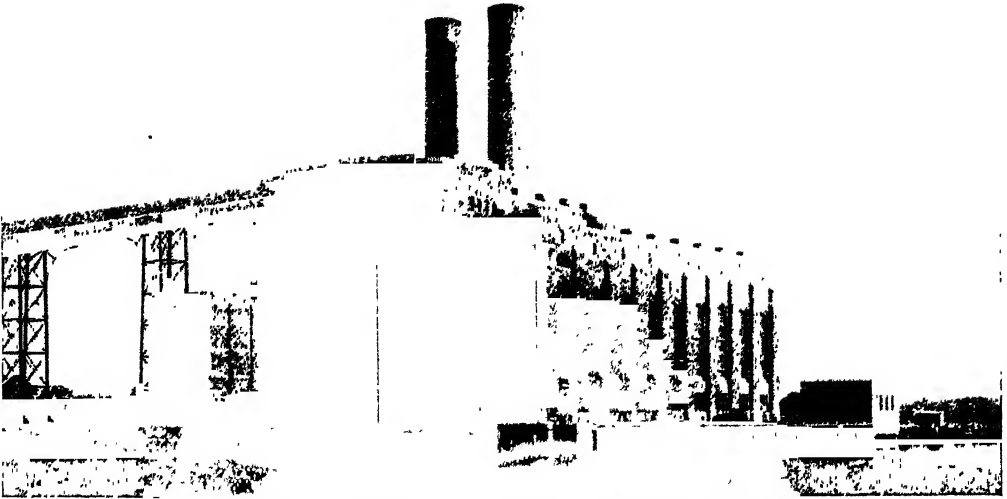
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*Photographs courtesy General Electric Company*

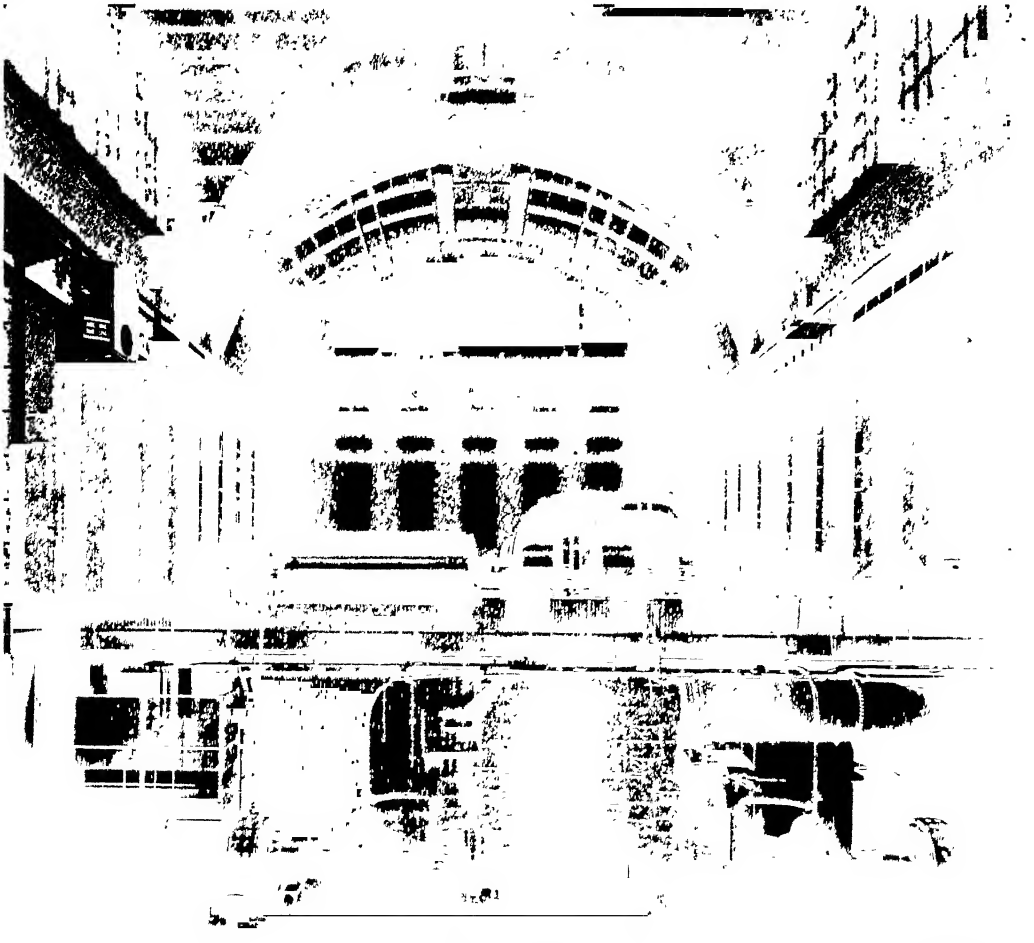
1. Twelve-Cubic Yard Electric Shovel.

2. High Speed Car Dumper.

## ELECTRIC POWER STATIONS



EDGAR STATION, EDISON ELECTRIC ILLUMINATING CO., BOSTON,  
EMPLOYS STEAM AT 1400 POUNDS



TURBINE ROOM IN THE RICHMOND STATION OF THE PHILADELPHIA ELECTRIC CO.  
Shows condenser and circulating pumps below the turbine. This is one of the  
newer stations in the 400-pound class.

output of energy has almost doubled every five years. In 1928 three-quarters of all the power used in the industries was electrical and two-thirds of this electrical power came from the central stations. The growth is shown in the following table:

	1913	1928
Capacity in kilowatts	7,000,000	32,000,000
Output, millions of kw-hrs.	16,800	70,000
Gross earnings	\$337,000,000	\$1,909,000,000

The capital invested in these central stations is estimated in excess of 23 billion dollars.

Information for the year 1927 on the purchasers of this energy is as follows:

	Customers	Millions of kw-hrs.
Domestic	17,860,000	7,389
Commercial (small units)	3,441,000	10,580
Commercial (wholesale)	563,600	36,787
Other services	29,917	6,836
Total	21,894,517	61,592

The average rate to all consumers was 2.7 cents per kw-hr. Of this energy, 63 per cent was produced from fuels and 37 per cent from water power. By increased efficiency, the consumption of fuel has been brought down from 3 and 4 pounds per kw-hr. to less than 1.8 pounds in 1927. This growth in the use of electric power has exerted an important economic and social influence on this country by increasing the production of wealth and decreasing the cost of manufacture as a result of the increased substitution of mechanical power for manual labor. There is a direct relation between the mechanical horse power at the command of each wage earner and the amount and value of the product of his work.

	H.P. per Wage earner	Value of Product per year	Wages per year
1900	2.13	\$2,450	\$ 437
1914	3.25	3,460	590
1925	4.27	6,900	1,280
1928	5.	....	....

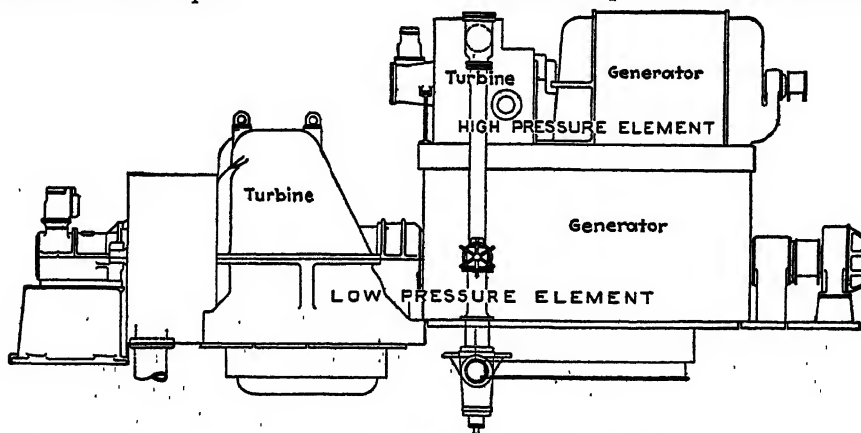
Figuring one horse power as the physical labor of 10 men, it can be seen that each wage earner in the United States is a foreman directing the work of 50 slaves. It is worthy of note that in Great Britain the allowance for power per man is about one-half that in the United States and the value of the product less than half, and that all other countries are behind Great Britain in this respect.

With the increasing cost of coal, it was found more economical to generate the electric energy in large central stations where the coal can be used most efficiently and where coöperation makes the load more steady, or, in technical phraseology, where the load factor is better. The same cause has resulted in a very notable increase in the number and size of the hydro-electric stations. These are generally operated in a system containing steam stations, and the load is allocated by a load dispatcher so that the most economical stations (hydro) operate all the time, and the less economical only carry the peak loads, or when the water flow is inadequate.

**Generators.** There has been a steady growth in number and size of steam turbo-generator sets and the practical extinction of reciprocating steam engines. In 1914 the limit was 40,000 horsepower in one set. In 1928 sets were installed having in one unit a rating of 94,000 kilovolt-amperes (125,000 h.p.) and under construction there were sets of 160,000 kva. (215,000 h.p.) and 208,000 kva. (280,000 h.p.), the former for New York and the latter for Chicago.

With the increase in size, there also has been a steady increase in the pressure and temperature of the steam used in the turbines. From 215 pounds gauge and 150° F. superheat, practice advanced in one step to 600 pounds and 725° F. maximum temperature and there are now machines in commercial operation at 1200 pounds pressure. This makes it possible to obtain one kilowatt-hour with 14,000 British thermal units of heat energy giving an efficiency of 24 per cent.

Many improvements were made in the design of the electric generator itself, so that this great increase in power capacity is obtained with only a small increase in the dimensions and weights. Recent generators weigh much less per kilowatt than those of 1914. This was made possible by pushing the peripheral speed up to about 25,000 feet per minute, by the use of mica insulation on the armature and asbestos on the fields, and by improving the ventilation. Efficiencies of 98 per cent and higher are common in these generators. A notable change in practice was the rapidly increasing use of closed-circuit ventilation. The air for cooling purposes, after passing through the generator and carrying off the heat, is sent through a radiator like that used on an automobile, except that the water cools the air,



Double-deck Compound Turbo-generator of Pacific Gas & Electric Co., of San Francisco, built by General Electric Co. There are two machines each rated at 50,000 kilowatts and operating at 1200 pounds steam pressure.



or the air is passed through a spray of water to which it gives up its heat, and then is returned in closed ducts to the generator to be used over again. The advantage of this is that no dust nor dirt is carried into the generator to clog its air ducts.

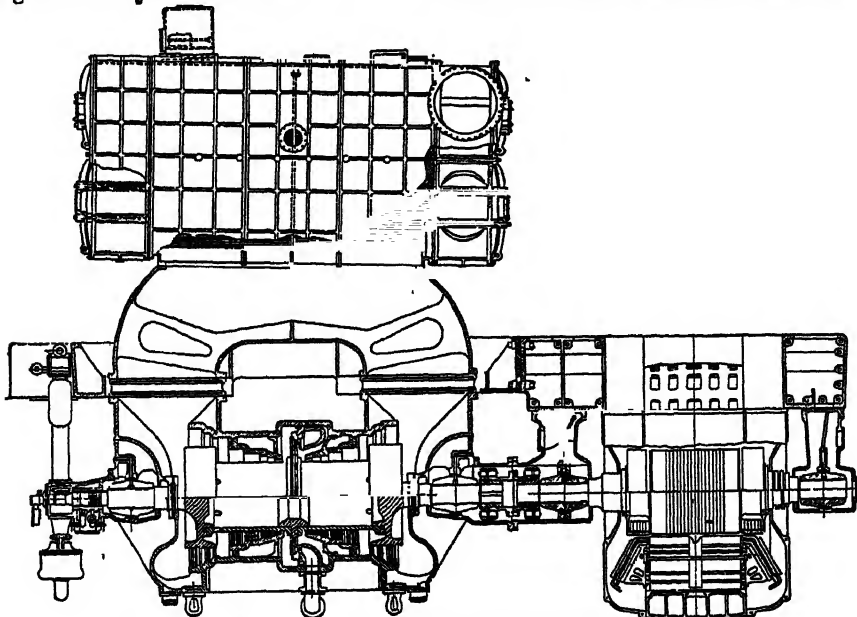
The development of a successful voltage regulator had a marked effect on the design of large alternating current generators; freed from the requirement of good inherent regulation in the machine, the designer has freer hand in his work and can economize in material. There was a steady trend toward 60 cycles as the standard frequency. It is now possible to obtain synchronous motors and converters of large sizes which will operate entirely satisfactorily at this frequency, so that the principal reason for choosing 25 cycles has disappeared.

As a result of the increase in the size of the generating units and particularly the increase in length, the type of set using a vertical shaft went out of favor and the horizontal shaft came into universal use. The improvements in the efficiency of these generating sets was so rapid that it was the rule to scrap a perfectly good set after a few years' use and buy a new and larger one, because the new one would require so much less coal in a year that the saving in cost of coal would more than pay the interest on the new set. Some of these large sets use \$1,000,000 in coal each year, so that a saving of 10 per cent is substantial. This is what is meant by obsolescence.

A feature of the development of steam turbines was the two-cylinder machine in which the turbine is divided into two parts, one for high-pressure steam and the other for low-pressure steam. Each part has its own generator, connected in parallel electrically, but independent physically. The same steam passes first through the high-pressure turbine and then through the low-pressure part to the condenser. This design is particularly desirable with the reaction type of turbine which has a tendency to be long and clumsy in dimensions.

In the design of power stations, a change to be noted was the smaller number and larger capacity of the units as a result of the greater reliability of the newer machines and also of economic conditions. Central stations cultivated off-peak load customers, such as those that use power many hours per day, and therefore improve the load factor of their stations; that is, they raised their average all-day load to approach more nearly their maximum peak load. On account of the very good efficiency of large sized units, as compared to smaller sizes, and a new business policy on the part of the central stations resulting in more reasonable rates, the isolated plant is becoming more and more rare. Almost all recent new buildings and industries obtain their electrical energy from a public-service company instead of installing an independent generating plant. The growth of hydroelectric stations was very great because of the high cost of coal. Many a station of this type which some years earlier faced bankruptcy showed a good profit when reorganized, and many new stations were built, although recent cost of construction has been almost double the 1914 figure. The size of generating units used increased rapidly. In 1916 the largest water-wheel generators in service were of 18,000 kw.; 1921, 32,000 kw., 1922, 45,000 kw., and 1924, 65,000 kw. The operating speeds were increased each year so that a 60,000-kw. machine of 1924 was not much larger than an 18,000-kw. machine of eight years previous. In 1928 there were none of greater capacity than 65,000 kw. (87,000 h.p.). The Conowingo Plant had seven generators of 40,000 kw. each running at 82 r.p.m. and, these, because of the low speed, were larger in bulk than heretofore built.

**Circuit Breakers.** With the growth in the size of power units and the increase of station capacities, it was necessary to develop larger and more powerful circuit breakers or switches to open the circuits in cases of trouble or excessive current. The type breaking the circuit under oil is most used where high voltages and



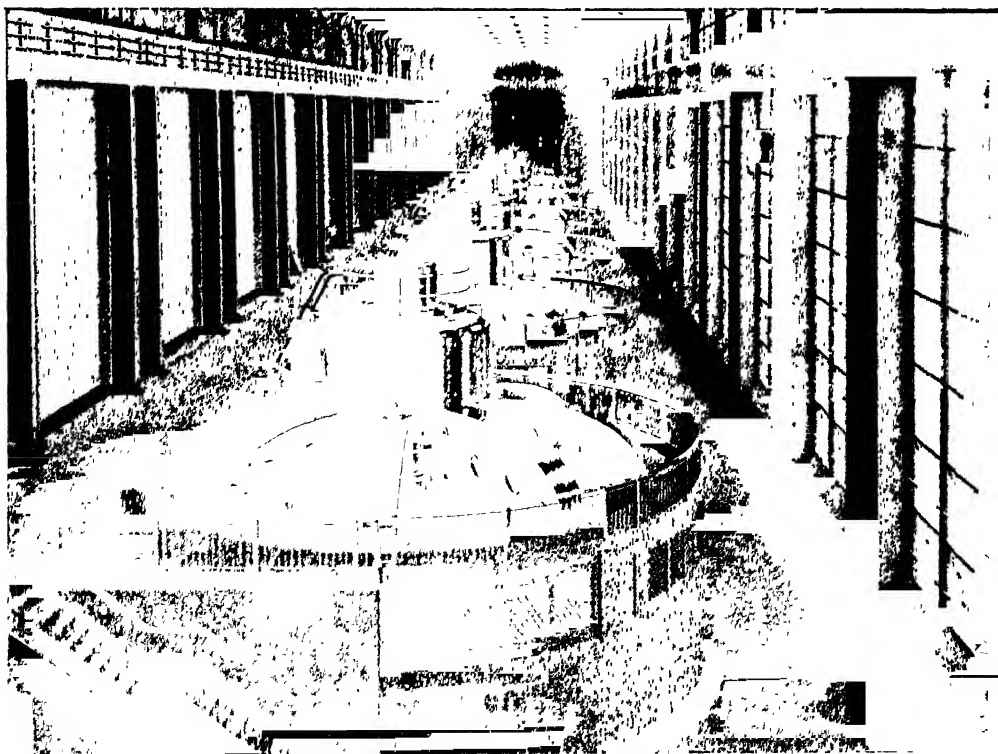
Longitudinal section of modern steam turbine and electric generator

## ELECTRIC GENERATING MACHINERY



*Courtesy of General Electric Co.*

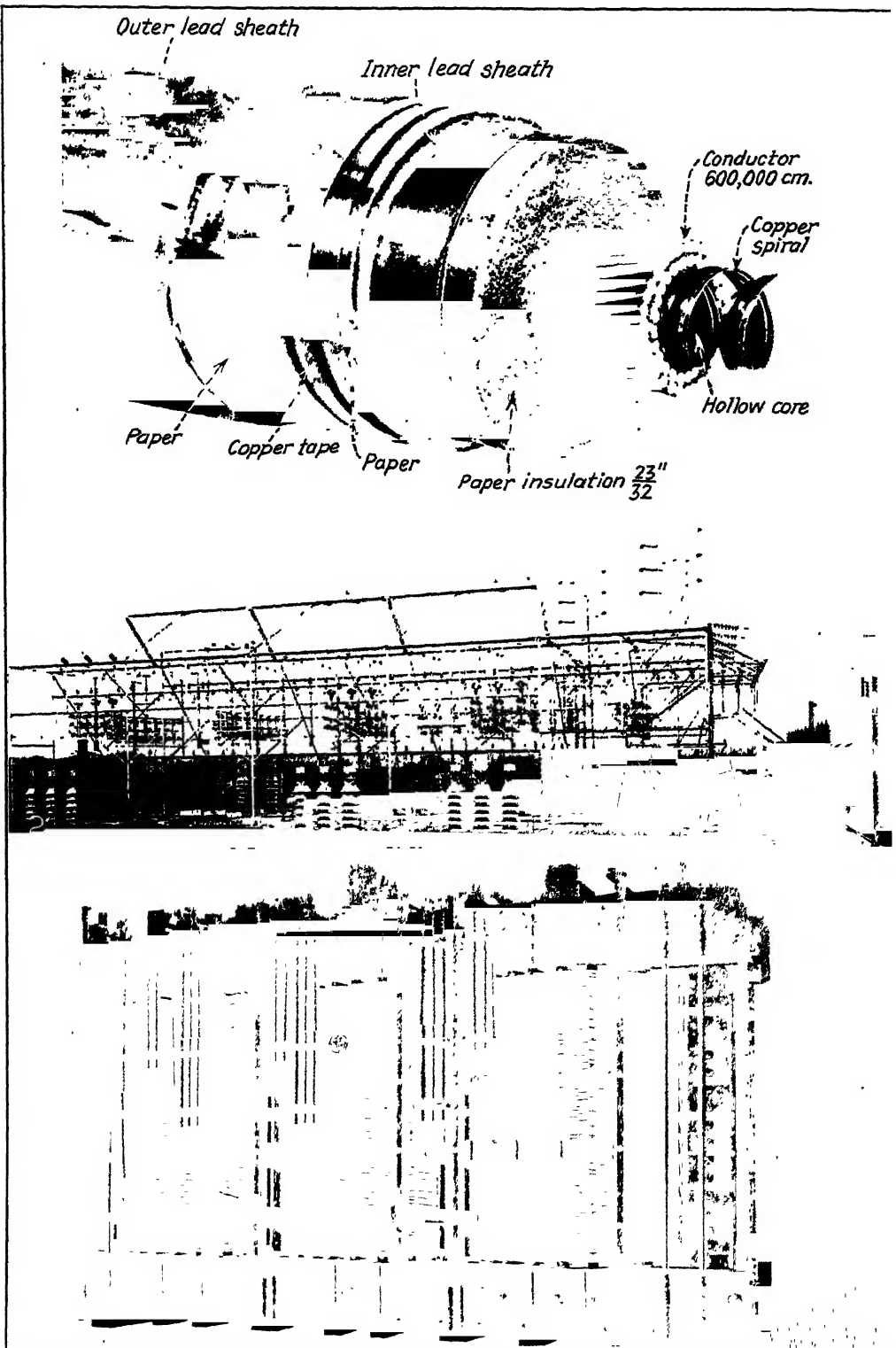
**160,000-KILOWATT TURBO-GENERATOR FOR NEW YORK CITY**



**INTERIOR VIEW OF CONOWINGO POWER HOUSE**

**This station contains seven 54,000-horsepower water-wheel-driven generators**

# ELECTRIC POWER TRANSMISSION



Photographs courtesy of General Electric Company

1. Oil-filled Underground Cable for 132,000 Volts.
2. Outdoor Switching Station for 110,000 Volts at Elmira, N. Y.
3. An 83,333 kilovolt-ampere Auto-transformer.

large power units are involved. The most noteworthy is one capable of interrupting 2,500,000 kilovolt-amperes in a 220,000-volt system. It weighs 85 tons. For lesser voltages the quick-break air switch is very generally used both for direct and alternating current, but particularly for the supply circuits in heavy direct current railway operation.

**Control and Protection of Circuits.** In 1914 the practice of protecting generators by inserting reactors or inductance coils in series with them to limit the current which would flow on short-circuit was new and not general. Ten years later every large station had several of these devices designed to limit the current to a certain definite maximum value. Some stations connected these in the generator leads as well as in the feeders; the latter was the more usual connection. The control and protection of large distributing systems was furthered by the development of relays accomplishing innumerable purposes indicated by their names, overload relay, low-voltage relay, reverse-current relay, time relay, etc. These were ingenious electromagnetic devices designed to open large circuit breakers when any one of these various phenomena occurred. One of the notable developments in electrical engineering is the increase in number and kinds of relays and their applications. A new type of switching equipment came into general use, the truck type safety switch. This is an oil switch mounted on a rolling truck and so arranged that when the switch is open, the switch and its truck may be rolled out into an open passageway, so that it is left entirely disconnected from all potential and is safe and convenient for inspection and repair. The phase balancer is a machine which was developed and installed in some large power systems. It is a special form of synchronous motor connected to the lines of a polyphase system; its function is to maintain a balanced load on the different phases of the generators even if the load on the system is very unevenly distributed between phases. This results in better voltage regulation and better generator efficiency.

As a matter of good economic policy, it was found desirable to interconnect all neighboring power systems, so that in case of an overload or an accident in one system, energy might be supplied by another. In the case of systems of the same frequency, this is done by transformers, but with two systems of different frequencies, e.g., 60 and 25, a frequency converter must be used. This may consist of two machines of like power on the same shaft, one having 10 poles for 25 cycles and the other 24 poles for 60 cycles, but this is an expensive arrangement. A new set was developed in 1923 consisting of a 37,000-kva. induction motor with 14 poles for the 60-cycle system and a 25,000-kva., 25-cycle synchronous motor with 10 poles. The induction motor takes power at 60 cycles and tends to run at 514 revolutions per minute but is held to 300 revolutions by the other machine. Thus the secondary of the induction motor generates power at 25 cycles, slip frequency, which may be turned into the 25-cycle system along with the power developed by the synchronous machine. In case the demand is in the opposite direction, the frequency of that system becomes slightly less than 60 cycles, and the induction motor becomes an induction generator and delivers power at the frequency of the system,

while the 25-cycle machine operates as a normal synchronous motor.

**Bibliography.** Among the more notable works on electric power stations and generating apparatus published after 1914 were Croft, *Central Stations* (New York, 1917); Fernald and Orrok, *Engineering of Power Plants* (New York, 1927); Gebhardt, *Steam Power Plant Engineering* (New York, 1925); Langsdorf, *Principles of Direct-Current Machines* (New York, 1919); Lawrence, *Principles of Alternating-Current Machinery* (New York, 1919); Morecroft, *Continuous-Current Circuits and Machines* (New York, 1923); Morecroft, *Alternating-Current Circuits and Machines* (New York, 1925); Rushmore and Lof, *Hydro-Electric Power Stations* (New York, 1923); Weingreen, *Electric Power Plant Engineering* (New York, 1922); Morrow, *Electric Power Stations* (New York, 1927).

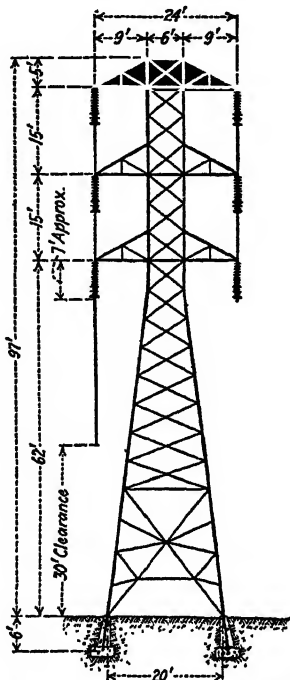
Consult also the following journals for special articles in this field: *Transactions of the American Institute of Electrical Engineers* (New York); *Electrical Journal* (Pittsburgh, Pa.); *Electrical World* (New York); *General Electric Review* (Schenectady).

See POWER PLANTS; STEAM ENGINES AND STEAM TURBINES; WATER POWER.

**ELECTRIC POWER TRANSMISSION AND DISTRIBUTION.** In the war period and the years following, one of the most striking subjects of discussion in transmission engineering was the movement for the construction of a super-power transmission system, a forward-looking scheme for the combination of all producers and users of mechanical power in a given geographical district of the United States into one large electrical network. The advantages sought are reliability, secured by the ability of the various power houses to help each other out in case of accident to one; greater economy, through the use of most efficient stations all the time and the less efficient only when actually needed; better load factor, from less variable demand made by a greater number and variety of users in the system; shutting down of wasteful stations; reduction in the cost of fuel by concentrating the load at those places where fuel can be obtained most conveniently, and utilization of water power wherever practical. The plan contemplated several districts at first and a final interconnection of these districts as they spread toward each other. California was the heart of the first district where it went into actual operation. Here the plan was well under way in 1924, for on account of the scarcity of coal, the generation of power was in the hands of a few corporations which could cooperate readily.

Another interesting district was that of the North Atlantic States. Here it was proposed to install a 250,000-volt transmission line from Boston to Washington through New York, Philadelphia, and Baltimore, with possible branches to the coal fields of Pennsylvania. It was proposed that all the large generating plants in this district should connect up to the system and supply power, and that all the small plants of individual factories be shut down, since they could save money by buying from the large system. In his report to the Secretary of the Interior, W. S. Murray estimated that 10,000,000 h.p. was used in the industries in this district, and 7,000,000 h.p., by railroads; that the load factor of this power was about

15 per cent and that by combination this load factor could be raised to 50 or 60 per cent. This meant the 17,000,000 h.p. in use could be replaced by 6,000,000 h.p. properly located and controlled, and that 30,000,000 tons of coal could be saved each year and the railroads relieved of the congestion caused by the useless and uneconomic transportation of this coal. The same authority estimated that it would cost about \$1,250,000,000 capital to accomplish the change and that the resultant saving would be \$300,000,000 per year, or 24 per cent on the investment. This was for only one geographic district. The difficulty was to get so many different interests together and assure to each its share of the saving or gain.



Elevation of a high-tension line tower with strings of insulators, ring shields, and conductors.

**Transmission Lines.** The most important accomplishment in transmission engineering was the adoption of 220,000 volts as a working potential for transmission lines and the practical operation of two such lines. Previously, 165,000 was the highest potential used in regular practice. Two notable lines were installed in California. The Southern California Edison Company had a line 240 miles long installed and planned in 1924 to extend it. Incidental to the use of 220,000 volts as a working potential, the manufacturing companies built transformers for 1,000,000 volts for laboratory purposes to test out the apparatus to be used in the 220,000-volt lines. Transformers in sizes up to 16,000 kva., built for commercial purposes, were arranged with 130,000 volt high-tension windings for a Y connection on 220,000 volts with the neutral grounded. The line itself used large steel towers, eight to the mile, carrying the three conductors in a horizontal plane, hanging from strings of suspension insulators. Each string of insulators was protected by a static shield consisting of a metal ring surrounding and concentric

with the insulators. This ring was connected to the conductor and reduced the potential strain on the insulators by giving the electrostatic field a more uniform distribution. Authorities disagreed as to whether an overhead ground wire or lightning arresters were of any benefit on lines of this high potential. In the Southern California line, the conductors were 0.95 inch in diameter, were stranded aluminium cable with a steel core, and were spaced 210 inches apart. Experimental research indicated that with conductors of about one inch in diameter the loss from corona would not be important. The duplicate lines of 6 conductors were carried on two lines of steel towers so that the minimum clearance above ground was 30 feet. The insulators were of the disc-suspension type, 13 in each string, and shielded with rings.

The outdoor type of switching station became usual rather than exceptional. With the increase in the potential used the space required for the switches, circuit breakers, and lightning arresters became so great that it was expensive to put them in a building, and they could all be made water-proof. Oil-cooled transformers and water-cooled, oil-insulated transformers continued to lead the air-cooled in number of applications and were improved by the addition of a device known as the oil conservator, a reservoir attached to the oil tank and above it so that the transformer tank proper was always full and completely sealed from the atmosphere. This reduced oxidation of the oil, moisture in the oil, and the danger of explosive gases. The increase in length of transmission lines raised a serious problem in the regulation of the voltage and the power factor of the system. This was met by the use of synchronous condensers with relays controlling the field excitation to hold the voltage and power factor at predetermined values. In a 220,000-volt line, it was proposed to place such a device in circuit every 100 miles. Single units of this character of 30,000 kva. were placed in service. The use of the static condenser for alternating-current distribution circuits grew considerably. These were oil-insulated static condensers connected to the end of a distribution system to improve the power factor and voltage regulation of the system. They operated at about 2200 volts, and if the voltage of the system were much less than this, auto-transformers were used to step up the voltage.

The oxide-film lightning arrester was brought into quite general use. It consists of a number of units in series, depending on the voltage of the system, each unit constructed of two conducting plates separated by a short space filled with oxide of lead in the form of a powder, paste, or pellets. Ordinarily, this material is non-conducting, but an excess potential breaks through and allows a discharge current. This current heats the material in the small area through which it flows, and this heat changes the character of the material at that particular point into an insulator, thereby healing up the punctured spot. These are used for voltages up to 135,000.

The transmission of energy by underground cables, as in large cities, was improved by the use of improved insulating materials, resulting in the successful operation of cables at much higher potentials.

In 1914 the highest voltage was 13,000, but in 1927 several installations at 132,000 volts, three-



phase, were made using cables filled with oil as an insulating material and the level of the oil very nicely maintained by ingenious devices. Testing sets for experimental work and testing of insulation were developed so that a sustained alternating voltage of 2,100,000 volts was available and impulsive discharges from condensers known as lightning generators, as high as 3,600,000 volts were available. This method was also used for making artificial lightning in a general study of lightning protection, which has recently become the main difficulty in high-voltage, long-distance transmission. The cathode ray oscillograph was developed to aid in this study and this device makes it possible to record on a picture film the change in potential or current in the circuit, which lasts only a few millionths of a second. While 220,000 is the highest voltage in commercial use in the United States, in Germany one line operating at 380,000 volts has been put into operation.

The size of commercial transformers has been gradually increasing and has reached that of 40,000 kva. in one transformer at 132,000 volts and 28,866 kva. for use in 220,000-volt systems. These transformers have an efficiency of 99.5 per cent and greater. The use of voltage control of systems by changing taps on transformers has become very general. This is accomplished by having a number of taps on the low-voltage side of the transformer and an ingenious device which changes the connection of the line from one tap to another without short-circuiting any part of the transformer winding, and by means of relays this may be done automatically. Carrier current telegraphy and telephony has become quite general for the sending of orders and information from one part of the transmission system to another over the high-voltage power lines by means of radio-frequency currents or the so-called wired wireless. The message goes by a high-frequency current which is put on the power conductors by a capacity coupling which avoids any chance of a leak of the power current. This is really duplexing the power lines as done in telegraphy and telephony. In the distribution system, there has been a great activity in the development and perfection of the alternating-current distribution by means of special transformers, regulators, and protectors which make it possible to inter-connect the various distribution feeders for normal operation and maintain good voltage regulation and still be able to segregate automatically any circuit or transformer which develops a fault. With these improvements and the increasing reliability of the alternating-current distribution system, the distribution of electrical power by means of direct currents is being restricted to a smaller and smaller percentage of customers and even in some of the larger cities the direct-current distribution is being withdrawn and the alternating-current network is being substituted.

**Bibliography.** Consult Baum, *Atlas of the United States of America Power Industry* (New York, 1923); Peek, *Dielectric Phenomena in High Voltage Engineering* (New York, 1920); Reyneau and Seelye, *Economics of Electrical Distribution* (New York, 1922). Waddicor, *Principles of Electric Power Transmission* (New York, 1928).

**ELECTRIC RAILWAYS.** The development of electric traction on heavy main lines in the United States is indicated by the following

tabulation of steam railroads which have electrified the portion of their route indicated:

Railway	Date	Route Miles	System
Chicago, Milwaukee & St. Paul	1916	676	DO*
N. Y. New Haven & Hartford	1907	152	SP*
Fort Dodge, Des Moines & So.	1911	147	DO
Long Island R. R.	1910	138	DO
Virginian Ry.	1926	134	SP
Penn. R. R. (Phila.)	1915	125	SP
Norfolk & Western	1915	64	SP
N. Y. Central	1906	63	DO
Southern Pacific	1914	50	DO
Illinois Central	1927	38	DO
Butte, Anaconda & Pacific	1912	37	DO
Erie	1907	34	SP
Baltimore & Ohio	1896	32	DO
N. Y. Westchester & Boston	1911	27	SP
Great Northern	1909, 1928	26	SP
Detroit, Toledo & Ironton	1928	17	SP
Boston & Maine	1911	8	SP
Michigan Central	1910	5	DO
Lackawanna (projected)	1929	78	DO
Phila. & Reading (projected)	1929		SP

\* DO = direct current.    \* SP = single phase.

The single-phase roads mostly operate with 11,000 volts on the trolley. Some use single-phase motors, some (Norfolk & Western and Virginian Railway) use a single-phase trolley, a phase-splitter, and three-phase motors, while some use direct-current motors supplied by a motor-generator set on the locomotive (Great Northern). The later direct-current roads use a high voltage on the trolley, 3000 volts in the case of the St. Paul.

In other countries, Mexico, Brazil, and Chile are using high-voltage direct current; Germany, Norway, Sweden, and Switzerland favor the single-phase while Italy has about 600 route-miles of three-phase railroads.

The Norfolk & Western is typical of the American alternating-current roads. This covers the division from Bluefield to East Vivian, W. Va.; the service consists of hauling coal trains of 3250 tons up a 1.25 per cent grade at a speed of 14 miles per hour, requiring 3200 h.p. at the locomotive. Twelve electric locomotives of 264 tons replaced 33 steam locomotives of the Mallet type. The electric locomotives take current at 11,000 volts, 25 cycles, single-phase, from an overhead trolley. This is converted to three-phase current by a phase converter on the locomotive and supplied as such, at a suitable voltage, to the three-phase induction motors which drive the locomotive. The merit of the combination was that the three-phase motors are more efficient than single-phase motors; they are constant speed motors which will regenerate power on down-grades automatically at a definite speed and thus act as brakes; finally, by means of this converter, a single overhead trolley may be used to supply three-phase motors.

The St. Paul Railway put into operation a section of 440 miles in Montana in 1917 and a second section of 220 miles in Washington in 1920. The first includes the heavy mountain grades of 2 per cent. Both are equipped with an overhead trolley operating at 3000 volts direct current, from which the electric locomotives of 290 tons take current. These locomotives are capable of hauling trains of 2500 tons up the grades at 16 miles per hour, giving 3000 h.p. continuously, and each locomotive makes the entire run of 440 miles without change or lay-off. The train crews are changed in the middle of the run. The locomotives also use regenerative electric braking when descending grades; that is, the electric motors act as gen-

erators, hold the train at a desired speed, and return the energy of the descending train to the line to be used elsewhere. This railroad takes its electric energy from existing public-utility companies, which in turn derive it mainly from water power. In Norway and Sweden, the single-phase system has been considerably extended, and in Italy the three-phase system has been further developed and extended.

Among urban street railways, the rapid and general adoption of the light-weight or one-man safety car was the outstanding feature. This is a very light car of moderate passenger capacity, usually having two motors of 20 h.p. The car doors are arranged to open and close automatically, interlocking with the control of the motors so that the car cannot be started until all doors are safely closed. With this precaution, it is safe for one man to act both as motorman and conductor; this reduces the cost of labor, and the light weight reduces the power required.

The development of the automatic substation was an achievement of the period succeeding the World War, and the increase in its use was phenomenal. It was employed in many applications and industries, but its most general and important field was the electric railway. This is a substation for the conversion of the high-voltage alternating-current power of the transmission line to the low-voltage direct-current power of the trolley or third rail. The station contains transformers, converters, and switches, operated by relays so that the machinery is started up just when it is needed and shut down when the demand has ceased, without the intervention of any human labor. The relay controls all the operations. An inspection of a few minutes each day is all the human attention the station requires.

There have been many installations (1926-28) in which mercury-arc rectifiers have taken the place of converters. These rectifiers have no moving parts, are much smaller and less expensive and at high direct-current voltages are more efficient than the converters. As they are still in the status of development, they are not yet made in the larger capacities, and have still to prove their superiority.

The high-speed or quick-break switch has been very successful in railway substations. In case of trouble in any line, it disconnects that line before it has caused trouble in any of the substation apparatus.

Some interesting tests were made at Erie, Pa., in the fall of 1923 to determine the maximum current which can be collected from an overhead trolley and the limit to the power of a locomotive on such a system. Currents of 4000 to 5000 amperes were collected at speeds of 50 to 60 miles per hour from two No. 000 wires by one pantograph trolley pressing upward at a pressure of 35 to 40 pounds. With 3000 volts on the trolley, this is equivalent to about 20,000 h.p. per locomotive.

Diesel-electric locomotives and self-propelled gas-electric cars have become very popular as they operate electrically without the use of an overhead trolley, a third rail or a power station. The power is supplied by either a Diesel engine or an ordinary automobile gasoline-engine driving a generator on the car structure. A new bus-type street car has been brought out which has many of the characteristics of a large bus but runs on a track, derives its power from an

overhead trolley, and uses electric motors driving the axles through a worm drive as used in automobiles. This gives better riding qualities and higher speed, hence less expensive, motors.

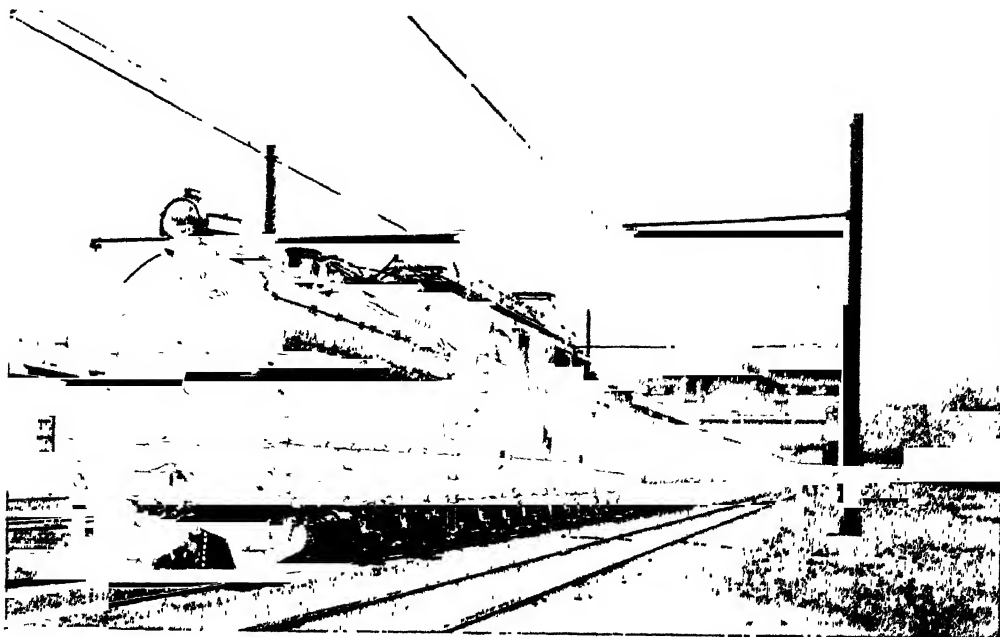
**Bibliography.** Consult Morison, *Railroad Electrification* (New York); Healy, *Electrification of Steam Railroads* (New York, 1929); Richey, *Electric Railway Handbook*, (New York); *Transactions of the American Institute of Electrical Engineers* (New York); *General Electric Review* (Schenectady). See RAPID TRANSIT.

**ELECTRIC SHIP PROPULSION.** The art of propelling ships by electric motors had practically its entire development after 1913, when the first vessel so equipped, the American collier, *Jupiter*, was put into commission. She had two 3000-h.p. three-phase induction motors on twin propeller shafts deriving their power from one steam turbo-generator of 5450 kilowatts. At the time of the Naval Disarmament Conference, the United States had built and under construction 20 electrically propelled vessels, mostly of the largest size, 30,000 tons each. Many of these were discontinued, but the U.S.S. *New Mexico*, *Tennessee*, *California*, *Maryland*, *Colorado*, and *West Virginia* were completed. These battleships remained in commission. Each of them had four propeller shafts and four motors aggregating 32,000 h.p. Under construction were airplane carriers having 180,000 h.p. of electric motors per ship. The battleships all use changeable pole induction motors capable of operating at two different speeds, usually 16 and 21 knots. As an example, the *Maryland* had two electric generators of 13,000 kilowatts each, driven by steam turbines at 2000 revolutions per minute. Her four propeller shafts were each driven by an induction motor rated at 7000 h.p. at 175 r.p.m. with 24 poles for 21 knots speed, and 1700 h.p. at 118 r.p.m. with 36 poles for 16 knots. One of the important advantages of electric propulsion for such vessels is the ability to reverse any propeller with full power at a second's notice. Steam turbines alone cannot be reversed so quickly or with so much power. The ability to operate conveniently and efficiently at two different speeds is another point in its favor, and the light weight and good efficiency obtained by the use of the high-speed turbines is a third.

More recently, the U. S. Navy Airplane Carriers, *Saratoga* and *Lexington*, have been placed in service. These are sister ships of 35,000 tons having 180,000 h.p. in eight electric motors. The *Lexington* has made a record of 34.82 knots in a test and a sustained speed of 30.7 knots in a run of 2228 miles from Los Angeles to Honolulu. There are now three merchant vessels, the *Virginia*, *California*, and *Pennsylvania*, of 30,000 tons each, equipped by the General Electric Company which run regularly between New York and San Francisco. See SHIPPING.

A development particularly adapted to freight vessels was the use of Diesel engines driving electric generators which in turn drive the motors on the propeller shafts. The Diesel engine is difficult to start, to reverse, and to build in large sizes. With the electric system, any number of units may be used, connected into an electric system, and the engines may run continuously in the same direction, the stopping and reversing being done at the motors. A large number of ferryboats are operated with

## ELECTRIC LOCOMOTIVES



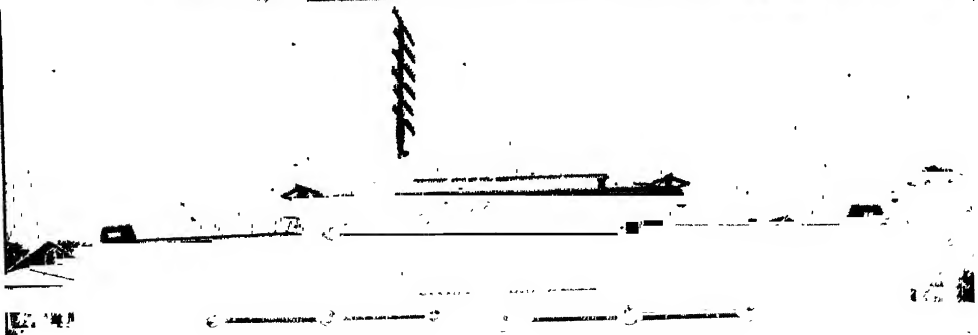
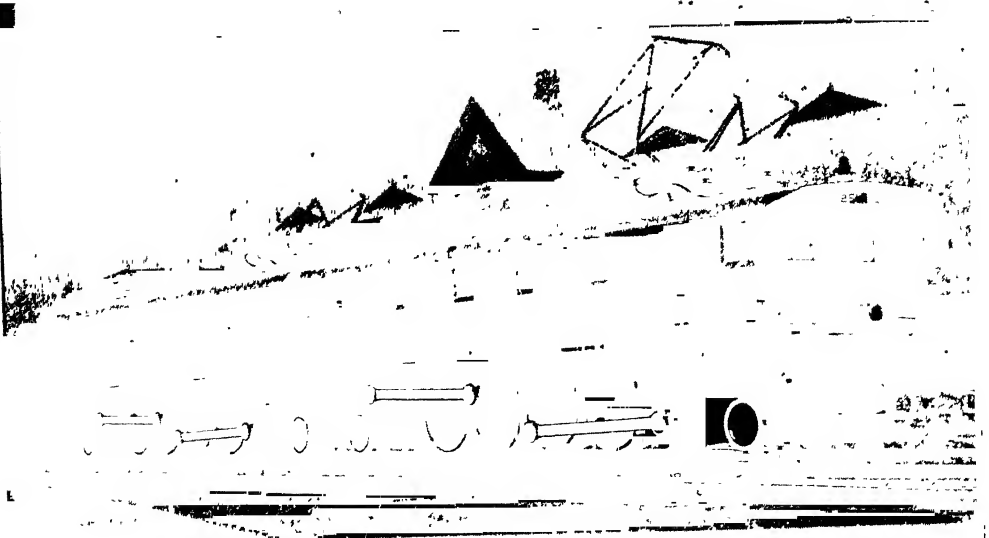
**TWO HUNDRED AND SIXTY TON MOTOR-GENERATOR TYPE OF LOCOMOTIVE  
FOR GREAT NORTHERN RAILWAY**



*Photographs courtesy of General Electric Company*

**TWO HUNDRED AND SIXTY TON, 3000-VOLT DIRECT CURRENT LOCOMOTIVE  
FOR THE ST. PAUL RAILWAY**

# ELECTRIC LOCOMOTIVES



Diesel-electric equipment. See SHIPBUILDING and NAVAL ARCHITECTURE.

**ELECTRIC SHOVELS.** See ELECTRIC MOTORS IN INDUSTRY.

**ELECTRIC SUBSTATIONS.** The development of apparatus for substations kept pace with other advances. Synchronous converters were built, of larger capacity and for higher speeds, and the weight per kilowatt decreased. The improvement in 60-cycle converters was notable. The substation for converters or motor-generator sets was revolutionized; it was made independent of all labor for attendance. By the development of ingenious relays, these automatic substations start up when needed; the machines are brought up to speed, synchronized with the supply system, and connected to the load circuit. This idea was first put into effect in 1916 and hundreds of such stations have been installed since then, in sizes up to 4000 kilowatts and for voltages up to 3000 on the direct-current side. This idea was first introduced in the electric railway systems (see ELECTRIC RAILWAYS) and was so successful that it was adopted for industries, mines, and even small isolated water-power plants forming part of a system. Thus, it is possible to place a water-power station in some out-of-the-way place where hydraulic development is cheap, have it feed current into a system when power is desired, and yet have it require no attendants in the station. An inspector visits these stations regularly and tests them out; that is all the attention required. A water-power station of this character for 100,000-kw. capacity was installed near Louisville, Ky.

**ELECTRIC THEORY.** See CHEMISTRY; PHYSICS.

**ELECTRIC WELDING.** The uses of electric welding became so important during the World War that the United States Government fostered a special organization to study and develop the art. Under this stimulation, research was carried on, new methods devised, and new applications found. A large part of the repair work on the German steamers interned in 1914 and taken over by the United States in 1917 was done by electric welding. Ships were built in which welding was substituted for riveting. Electric generators were devised which so regulated the current as to give a uniform character of weld. While most of the welding was done with direct current, alternating current also could be used. Welded or, as technically called, "fabricated" structures have taken the place of castings to a very large extent in the manufacture of machinery, particularly electrical machinery; trucks, buildings, and bridges are now being built by electric welding instead of riveting.

**ELECTROCHEMISTRY.** See CHEMISTRY, APPLIED.

**ELECTROMETALLURGY.** See ELECTRIC FURNACES.

**ELECTRONS, ELECTRONIC THEORY.** See ASTRONOMY; CHEMISTRY; PHYSICS.

**ELEMENTS.** See CHEMISTRY; PHYSICS.

**ELEVATED RAILWAYS.** See RAPID TRANSIT.

**ELIOT, THE RT. HON. SIR CHARLES (NORTON EDGUMBE)** (1864- ). An English diplomat and Orientalist (see VOL. VII). He was British High Commissioner in Siberia (1918-19), and British Ambassador to Japan (1919-20). He was made Privy Councillor in 1919,

Knight of the Grand Cross of St. Michael and St. George in 1923, and a member of the Imperial Academy of Japan in 1926. He wrote papers on marine biology and published *Hinduism and Buddhism* (1921).

**ELIOT, CHARLES WILLIAM** (1834-1926). An American educator (see VOL. VII). He favored the League of Nations and was a strong supporter of President Wilson and his administration. In his writings and lectures, he has stressed in particular his condemnation of the standardization of education and industry. He was presented with a medal for distinguished service by the National Council of Civic Reform in 1923. He published *The Road Toward Peace* (1915), and *A Late Harvest* (1924).

**ELIOT, SAMUEL ATKINS, JR.** (1893- ). An American theatre director and teacher of drama, born in Denver, Colo., and educated at Harvard University. He studied the German and English theatres and went on the stage with Miss Horniman's Repertory Company in England. In 1914-15 he was play reader and stage manager for Winthrop Ames in New York. In the latter year, he joined the Washington Square Players; in 1916-17, directed the Indianapolis Little Theatre and in 1917-18, the Cincinnati Art Theatre. He became assistant professor of English at Smith College in 1918 and has been associate professor since 1926, giving courses in drama and producing plays. Since 1924 he has directed the Studio Theatre, New York City. He wrote books on the theatre and made many translations from Wedekind. His works include *Little Theatre Classics* (3 vols., 1918-21), *Erdgeist* (1914), *Pandora's Box* (1914), and *Tragedies of Seneca* (1923). The three last are translations.

**ELIOT, THOMAS STEARNS** (1888- ). An American poet and critic, born at St. Louis. He studied at Harvard, the Sorbonne, and Oxford. From 1913 on, he made his home in London. He attracted attention with his *Poems* (1920), containing some of the best pieces of the decade, and *Waste Land*, also a poem (1922). He was preëminently an ironist and his mocking, possibly only clever, poems stirred and antagonized the modern literary world. In spite of its obscurities, pedantries, and often perverse symbols, *Waste Land*, with its feel of the aridity of the modern life and its fine poetical passages, was a memorable work. Mr. Eliot's critical studies were considered by some even more noteworthy than his poetry. His *Sacred Wood* (1920) shows the first English attempt, since Matthew Arnold, to formulate a thoroughgoing aesthetic creed applicable to literature and life. In 1922 he became the editor of the *Criterion*, a finely balanced periodical devoted to the arts. An edition of *Poems, 1909-25*, appeared in 1925. His other works are *Homage to John Dryden* (1924); *An Essay of Poetic Drama* (1928); *Shakespeare and the Stoicism of Seneca* (1928), and *For Launcelot Andrewes* (1928).

**ELIZABETH.** A manufacturing and residential city of New Jersey. The population rose from 73,409 in 1910 to 95,783 in 1920, and to 115,000 in 1928, according to local estimate. An ordinance was adopted in 1922 zoning the city into three residential, three business, and three industrial districts. In 1924 a city-planning commission was appointed to develop a comprehensive plan for future growth. The city has 238 manufacturing establishments and eight banks, including two savings banks. In 1926 a



four-track bridge of the Central Railroad of New Jersey was erected over Newark Bay between Bayonne and Elizabeth at a cost of \$15,000,000. The assessed valuation of property in 1927 was \$149,307,000; the net debt was \$4,873,000.

**ELIZALDE, RAFAEL HECTOR** (1873- ). A diplomat of Ecuador born at Guayaquil, and educated at the National College of San Vicente del Guayas and the University of Guayas. He was a member of Congress, served in various South American embassies, assisted in the settlement of the boundary line between Ecuador and Colombia, was minister of foreign affairs (1914-16), and from 1917 to 1924 was minister to the United States and Cuba. In 1925 he returned to the United States to seek recognition of the de facto government of Ecuador. From 1925 to 1928, he was minister to Chile. He wrote *Labores Diplomáticas* (1912), *Organización de Partidos Políticos* (1913), and *Riqueza Obliga* (1914).

**ELLIOTT, EDWARD** (1874- ). An American lawyer, professor, and banker, born at Murfreesboro, Tenn., and educated at the universities of Princeton, Berlin, and Heidelberg. From 1898 to 1915, he was successively instructor in Latin and jurisprudence, preceptor in the department of history, politics, and economics, and professor of politics at Princeton University. He was also dean of the college from 1909 to 1912. In 1913 he went to the University of California as lecturer on international law, and from 1916 to 1920 was professor there. From 1917 to 1920, he was director of the Federal Reserve Bank of San Francisco, and in 1921 became vice president of the Security Trust and Savings Bank of Los Angeles. He wrote *Die Staatslehre John C. Calhoun* (1903); *The Biographical Story of the Constitution* (1910); *Selected Documents in International Law* (1914); *American Government and Majority Rule* (1915); *State Bank Membership in the Federal Reserve System* (1919).

**ELLIOTT, HOWARD** (1860-1928). An American railway official (see Vol. VII). In 1913 he was appointed president of the New York, New Haven & Hartford Railroad Co., where he served until 1917, when he resigned and was made chairman of the Commission on Intercorporate Relations for that road. In 1918 he was elected president of the Northern Pacific Railway, serving until 1920, when he was made chairman of the board of directors. During the World War, he was a member of the special committee on national defense of the American Railway Association. He was active in the American Railway Association and was a director of many large railway and financial corporations. He was president of the board of overseers of Harvard University in 1925, and was also president of the alumni association. He was a life member of the corporation of the Massachusetts Institute of Technology. Middlebury College conferred the degree of LL.D. on Mr. Elliott in 1916.

**ELLIS, HENRY HAVELOCK** (1859- ). An English psychologist and author (see Vol. VII). Among his later works are *The World of Dreams* (1911); *The Task of Social Hygiene* (1912); *Impressions and Comments* (1914; second series, 1921; third series, 1924); *Essays in Wartime* (1916); *The Philosophy of Conflict and Other Essays* (1919); *Little Essays of Love and Virtue* (1922); *Kanga Creek, an Australian Idyll* (1922); *The Dance of Life* (1923); *Sonnets with Folk Songs from the Spanish* (1925).

Consult *Havelock Ellis; Philosopher of Love*, by Houston Peterson (1928).

**ELLIS, WILLIAM THOMAS** (1873- ). An American journalist and author (see Vol. VII). In 1917 he spent six months in Russia and in the year following was correspondent on the Persian, Caucasus, Rumanian, and French fronts. He was special correspondent for the New York *Herald* and associated newspapers in the Balkans (1919), for the Chicago *Daily News* and associated newspapers at the Conference on Limitation of Armament at Washington, D. C. (1921-22), and for the *Saturday Evening Post* and other magazines in the Near East (1923). He is the author of *Billy Sunday—the Man and His Message* (1917); and *Bible Lands To-Day* (1927).

**ELLWOOD, CHARLES ABRAM** (1873- ). An American sociologist (see Vol. VII). He published *The Social Problem* (1915, 1919), *An Introduction into Social Psychology* (1917); *The Reconstruction of Religion: A Sociological View* (1922); *Christianity and Social Science* (1923); *The Psychology of Human Society* (1925); *Cultural Evolution* (1927). Several of his works have been translated into other languages.

**ELMIRA COLLEGE.** An institution for women at Elmira, N. Y., founded in 1852 and operated under its present charter since 1855, is the first college for women to give degrees upon completion of a course the equivalent of that offered in colleges for men. The enrollment for the year 1927-28 was 595, and for the year beginning in September, 1928, it was 588. The faculty numbered 55. The endowment of the college in 1928 was \$776,644 and the income for the year 1927-28 was \$450,174, as compared with an endowment of \$134,572 and an annual income of \$76,635 in 1914. The library during the same period was increased from 11,000 to 28,275 volumes. Between 1914 and 1924, 10 new buildings were erected and the campus was enlarged; in 1926 a library costing \$346,968 was dedicated, and in the autumn of 1927 a dormitory costing \$424,000 was opened for occupancy. President, Frederick Lent, Ph.D., D.D., LL.D.

**ELY, HANSON EDWARD** (1867- ). An American soldier, who was born at Independence, Iowa, and graduated at the U. S. Military Academy in 1891. He served in Montana, North Dakota, and Nebraska (1891-97), was professor of military science at the State University of Iowa (1897-98), and then served two years in the Philippines, for a time in command of General Funston's mounted scouts. After an interval in other service, he returned to the Philippines in 1907 and remained five years. Arriving in France as a colonel in the summer of 1917, he was in command of the 28th Infantry when it captured Cantigny in the following year and led the 5th Division, 3d Army Corps, A.E.F., in forcing the Meuse crossing. He was decorated with the D.S.C. and D.S.M. and was made Commander of the French Legion of Honor. He was promoted to brigadier general in 1921 and placed in command of the General Service Schools and Post at Fort Leavenworth (1921-23); was commander of the Army War College at Washington, D. C., with the rank of major general (1923-28), and later was in command of the 2nd Army Corps Area with headquarters at Governors Island, New York Harbor.

**EMBRYOLOGY.** See ZOOLOGY.

**EMERGENCY FLEET CORPORATION.** See SHIPBUILDING; SHIPPING.

**EMERSON, JOHN** (1874— ). An American playwright and producer born at Sandusky, Ohio, and educated in Chicago and New York. He acted and produced plays for Daniel Frohman, William Harris, the Shuberts, Clyde Fitch, and others until 1910. He wrote and played in *The Conspiracy* (1912) and *Step Lively* (1913). He wrote and produced motion pictures for D. W. Griffith, Douglas Fairbanks, Mary Pickford, Constance Talmadge, and others until 1922, and later formed the Emerson-Loos Company, writers and producers of motion pictures.

**EMERTON, EPHRAIM** (1851— ). An American historian (see VOL. VII). He became president of the Cambridge Historical Society in 1921. Since 1914 he has published *Beginnings of Modern Europe* (1917), *The Defensor Pacis of Marsiglio of Padua* (1920), *Learning and Living, essays* (1921), and *Humanism and Tyranny: Studies in the Italian Trecento* (1925).

**EMERY, HENRY CROSBY** (1872-1924). An American economist (see VOL. VII). In 1916 he went to Russia to make a study of the commercial, industrial, and financial conditions there for the Guaranty Trust Company of New York City, and was returning in March, 1918, when he was taken prisoner in the Åland Islands by the Germans. On Oct. 22, 1918, he was released. From 1921 to 1924, he was manager of the Peking, China, branch of the Asia Banking Corporation with headquarters in New York.

**EMMET, LYDIA FIELD** (1866— ). An American portrait painter (see VOL. VII). She was awarded the Philadelphia Prize of the Pennsylvania Academy of Fine Arts in 1915, the Corcoran Popular Prize in 1917, the Maynard Prize of the National Academy of Design in 1918, the Popular Prize at the Newport, R. I., Exhibition in 1921, the Newport Popular Prize in 1923, and the Philadelphia Bok Prize in 1925. She has been a member of the National Academy of Design since 1912.

**EMMET, WILLIAM LEROY** (1859— ). An American electrical engineer and inventor, born at New Rochelle, N. Y. He was graduated from the United States Naval Academy in 1881, left the Navy in 1883, but rejoined it during the Spanish-American War. He was with the General Electric Company after 1892. He made important inventions in connection with steam turbines and invented the mercury-vapor power process. The Edison medal was awarded to him in 1919, and the Elliott Cresson Medal in 1920. He was a member of the Naval Consulting Board in 1915. He wrote *Alternating Current Wiring and Distribution* (1894), and contributed articles to the technical magazines on electrical and mechanical subjects.

**EMMONS, WILLIAM HARVEY** (1876— ). An American geologist, born at Mexico, Mo. He was graduated at Central College, Fayette, Mo., in 1897, and received his Ph.D. at the University of Chicago in 1904. After serving as an aid in the United States Geological Survey during 1904-06, he returned to the University of Chicago, where he remained until 1912, having been advanced to the associate professorship of economic geology in 1909. After that time, he was professor of geology and head of the department at Minnesota, and director of the Minnesota State Geological Survey. His principal investigations involved a genetic classification of minerals, the ore deposits of various mining districts in Nevada, Montana, Colorado, Maine, and New Hampshire. He published im-

portant reports in the United States Geological Survey series, on regionally metamorphosed ore deposits and the segregated veins, as well as petroleum geology. He served on the United States Geological Survey as assistant geologist during 1906-10 and as geologist, 1910-15, and was, besides, an associate editor of *Economic Geology*.

**EMPLOYER'S LIABILITY.** See WORKMEN'S COMPENSATION.

**EMPLOYMENT BUREAUS.** See LABOR LEGISLATION.

**ENDOCRINOLOGY.** See SECRETIONS, INTERNAL.

**ENELOW, HYMAN GERSON** (1877— ). A Russo-American rabbi born in Russia, and educated at the universities of Chicago and Cincinnati, and the Hebrew Union College, Cincinnati. He became rabbi of Temple Emanu-El, New York, in 1912. During the World War, he served overseas as commander and general field secretary of the Jewish Welfare Board (1918-19). Among his works may be mentioned *Aspects of the Bible* (1911); *The Jewish Life* (1915); *The Synagogue in Modern Life* (1916); *The Faith of Israel* (1917); *The War and the Bible* (1918); *The Adequacy of Judaism* (1920); *The Jew and the World* (1921); *The Diverse Elements of Religion* (1924).

**ENEMY ALIENS.** See UNITED STATES, under *History*.

**ENESCO, GEORGES** (1881— ). A Rumanian composer and violinist, born at Cordaremi. When only seven years of age, he was admitted to the Vienna Conservatory, where he studied under Hellmesberger (violin) and R. Fuchs (composition) until 1893. He then entered the Paris Conservatoire, continuing the violin under Marsick and composition under Fauré and Massenet, at the same time acquiring more than ordinary proficiency on the 'cello, piano, and organ. After graduating in 1899 as winner of the first prize for violin, he made a very successful concert tour and was appointed court violinist to the Queen of Rumania. His talent for composition showed itself early. In 1897 he gave in Paris his first concert of original chamber-music works, which impressed Colonne so much that in the following year, he produced the youthful composer's first orchestral work, *Poème Roumain*. After his return from his first tour, Enesco settled permanently in Paris. In 1923 he won emphatic success in the United States as violinist and conductor. In 1912 he was made chevalier, and in 1924, officer of the Legion of Honor. His works comprise three symphonies (E♭, A, and C); two *Rumanian Rhapsodies* for orchestra (A and D); two orchestral suites; *Symphonie concertante* for 'cello and orchestra; a quartet and an octet for strings; three violin sonatas; works in larger forms for one and two pianos. An opera, *Edipus*, has not yet been produced.

**ENGEL, ENG'EL, CARL** (1883— ). An American musicologist and composer, born in Paris. While studying philosophy and literature at the University of Strasbourg, he also pursued the course in music with Professor Jacobsthal. In Munich, he studied composition with L. Thuille and musicology with Professor Sandberger. He came to the United States in 1905, where he soon became known as an ardent advocate, and exponent of futurism, contributing to American and English periodicals. From 1909 to 1922, he was editor and musical adviser for the Bos-

ton Music Company. In 1922 he succeeded O. G. Sonneck as chief of the Music Division of the Library of Congress. His compositions, all ultra-modern, consist of smaller pieces for piano, piano and violin, and songs. He is the author of *Alla Breve: From Bach to Debussy* (1921).

**ENGEL, EDUARD** (1851- ). A German writer and student born at Stolp in Pomerania. He studied Sanskrit and mediæval languages at the University of Berlin, but later devoted himself to modern literature, especially German. He edited a selection of *Byrons Tagebücher* (1904), and wrote on the Shakespeare-Bacon problem, *Shakespeare-Rätsel* (1904). His later works are *Geschichte der deutschen Literatur* (1906); *Geschichte der deutschen Literatur des 19 Jahrhunderts und der Gegenwart* (1908); *Goethe, der Mensch und das Werk* (1911); *Deutsche Stilkunst* (1911); *Deutsche Meisterprosa* (1912); *Ein Tagebuch: 1914-19* (1920); *Die Weisheit Goethes* (1920); and *Sprich Deutsch!* (1923). He edited a popular history of German literature and a popular edition of Goethe's works.

**ENGELHARDT, ENGELHÄRT, EMIL A.** (1887- ). A German clergyman and writer who was born in Nundorf. Most of his works are concerned with the cultural position and future of Germany, among them being *Die Zukunft des Auslandsdeutschtums* (1916); *Auf deutschen Vorposten* (1916); *Fichtes Erziehungsgedanken und die deutsche Volkshochschule* (1918); *Tat und Freiheit, ein Fichtebuch* (1918); *J. G. Fichte, ein deutscher Mensch und Denker* (1919); *Fichtes Briefe an Braut und Gattin* (1920); *Erlöser Liebe* (1920); *Minne und Liebe* (1920); *Rabindranath Tagore* (1921); *Geist der Freiheit* (1922); *Die ewige Frau* (1923), and *Fichte-nationale Besinnung* (1925).

**ENGERT, ENG'ERT, T. JOSEPH** (1882- ). A German professor of philosophy and pedagogy. Since his début with *Der naturalistische Monismus Haeckels* (1907), he has written a number of works dealing with religious problems and with the World War, among them, *Vom Sinn des deutschen Krieges* (1916); *Zur Psychologie und Pädagogik der religiösen Begriffe* (1924); *Studien zur theologischen Erkenntnislehre* (1926), and *Das neue Leben* (1927).

**ENGINE, STEAM.** See **STEAM ENGINES AND TURBINES.**

**ENGINEERING FOUNDATION.** See **DAMS.**

**ENGINEERS, MILITARY.** See **ARMIES AND ARMY ORGANIZATION.**

**ENGINES, MARINE.** See **SHIPBUILDING.**

**ENGLAND.** See **GREAT BRITAIN.**

**ENGLAND, CHURCH OF.** This denomination is represented in the United States by the Protestant Episcopal Church. It is the established Church of England, and the King of England is the supreme governor, with the right to fill vacant archbishoprics and bishoprics. For administrative purposes, the country is divided into two provinces, the Convocation of York and the Convocation of Canterbury, each under the control of an archbishop. In 1914 Parliament provided for the disestablishment of the Church in Wales, which was delayed on account of the War until Mar. 31, 1920. The National Assembly, established in 1919, is composed of three houses, of bishops, clergy, and laity, and is privileged to deliberate on all church matters except its doctrines and the

duties of the ministry. An act ratified by the Assembly is presented first to the House of Lords, and second to the House of Commons by their ecclesiastical committees, and when passed by Parliament, receives royal assent, and becomes a State law.

In 1927 the Revised Prayer Book Measure, on which many of the clergy, particularly the Archbishop of Canterbury, had worked for 20 years, passed the Assembly, was subsequently approved in the House of Lords, and on December 15, was rejected by the House of Commons by a vote of 238 to 205. The following month, the House of Bishops commenced rewriting the controversial points of the book, and on Apr. 27, 1928, the Assembly passed a new prayer-book measure. Amidst intense feeling, the House of Commons again rejected the book on June 14, by a vote of 266 to 220. The opponents of the new prayer book believed that it tended toward Catholicism, particularly in the article sanctioning reservation of the Sacrament, while the adherents believed that by defining the powers of the clergy the freedom of the laity would be increased. Many feared that the defeat of so important a measure would result in the disestablishment of the church, but the clergy maintained a conciliatory attitude. The Bishops, however, placed the book upon sale in 1928, with a prefatory note stating that it had not been authorized for use in the church.

Dr. Randall Thomas Davidson, Archbishop of Canterbury, resigned, and was succeeded by the Most Rev. Dr. Cosmo Gordon Lang, Archbishop of York, in December, 1928. The Rt. Rev. William Temple, Bishop of Manchester, then became Archbishop of York.

In addition to the controversy over the prayer book, several measures relating to the church were passed, tending to improve the financial condition of the clergy; and on Jan. 1, 1928, an act went into effect making the Church of England in India a voluntary organization.

There were 2,359,599 members of the denomination in 1915, and in 1927 2,528,393 received Easter communion; in 1915 the Sunday school pupils numbered 2,541,000, and in year 1927, 1,841,359. In 1927 there were 12,890 incumbents, receiving a total net income of £5,779,826; there were from 16,000 to 17,000 clergymen, and the stipends of the assistant clergy amounted to £1,021,315. In the 43 dioceses, £7,113,844 was voluntarily contributed during the year, and a total of £9,910,683 was received from all sources. The Church Assembly budget for 1929 amounted to £146,271, including £32,700 for religious education, £50,000 for a clergy pension scheme, and £20,000 for training new candidates for the ministry; the greater part of the sum was apportioned to the diocese.

**ENGLAND, GEORGE ALLAN** (1877- ). An American author born at Fort McPherson, Nebr. He was graduated from Harvard in 1902, and a year later published *Underneath the Bough* (1903). Other works of his include: *The Story of the Appeal* (1914); *The Air Trust* (1915); *The Great Crime* (1917); *Their Son* (1919); *The Flying Legion* (1920); *The White Wilderness* (1922); *Dialect Dictionary of Newfoundland* (1923); *Vikings of the Ice* (1923); *Adventure Isle* (1925).

**ENGLISH HISTORY.** See **GREAT BRITAIN.**

**ENGLISH LITERATURE.** See **LITERATURE, ENGLISH AND AMERICAN.**

**ENNEKING, JOHN JOSEPH** (1840-1916). An American landscape painter. He was born in Munster, Ohio, and studied in Munich and chiefly with Bonnat and Daubigny in Paris. In 1876 he settled in Boston, where he was closely associated with George Fuller and George Inness. Especially after 1882 his art became increasingly subjective. He had a facility in catching and reproducing atmospheric conditions in his canvases. This facility is illustrated in his treatment of November twilights and forest scenes. Ralph Davol said of him, "Enneking was a modern romanticist combining qualities of the impressionist, luminist, and tonalist." He is represented in the Museums of Worcester and Boston and in many New England private collections.

**ENTOMOLOGY, ECONOMIC.** The losses caused annually by insect pests in the United States alone are estimated by entomological authorities to exceed the enormous sum of \$2,000,000,000. While many factors complicate the problem, it is the general conclusion that, in an average year with no unusual attack, the loss caused to crops is about one-tenth of the total production. The indirect losses caused by insect-borne diseases reach a large sum. The loss of productive labor in the United States through the sickness and death resulting from malaria is figured at \$100,000,000, or more, and from all insect-borne diseases at over \$350,000,000. With the introduction of new pests from abroad and with the rise and spread of other native insects, this loss may be expected to increase unless the status quo can be maintained through the application of preventive and control measures by the hand of man.

During recent years, new pests of vast economic importance have been unwittingly introduced into the United States from abroad and become established, including the pink bollworm, European corn borer, Japanese beetle, Oriental peach moth, pine-shoot moth, European earwig, European red mite, satin moth, Asiatic beetle, Japanese garden beetle, date scale, and others: A second class, consisting of earlier introduced pests which have continued to spread and increase in importance, includes the gipsy moth, brown-tail moth, sugar-cane moth borer, sweet-potato weevil, cotton-boll weevil, alfalfa-leaf weevil, Argentine ant, Mexican bean beetle, pear thrips, citrus whitefly, and citrus blackfly. Others, which may be referred to as a third class, have risen and assumed alarming prominence, such as the potato-leaf hopper, potato tuber worm, Arizona boll weevil, cotton hopper, pea moth, citrus aphid, pea aphid, apple red bugs, camphor thrips, and the fruit-tree-leaf roller. To a fourth class belong untold numbers of pests of no less importance that are threatening to enter our borders, including the Mediterranean fruit fly, Mexican fruit fly, and others.

Other pests, such as the codling moth, San José scale, Hessian fly, chinch bug, spring-grain aphid, corn rootworm, bollworm, cotton-leaf worm, army worm, the grasshopper, cabbage worm, Colorado potato beetle, grain weevil, and others continue their ravages and, though they may at times be checked by climatic conditions and natural enemies, necessitate eternal vigilance on the part of the American agriculturist. Still other insects have become of great importance as agents in the transmission of plant diseases, including the beet-leaf hopper associated with curly leaf of sugar beets, the spinach

aphid and potato-leaf hopper with potato-leaf roll and alfalfa and apple-leaf yellows, aphids with mosaic disease of plants, etc.

In combating these pests, the entomologists have adopted strategic means of every kind and the resulting advance in preventive and control measures has been epoch making. Resorting to legislative means, Congress enacted the Federal Plant Quarantine Act of Aug. 20, 1912, which immediately became effective as to certain quarantines, and up to July 1, 1928, was administered by the Federal Horticultural Board, consisting of five members appointed by the Secretary of Agriculture. At that time, the work was placed under the newly organized Plant Quarantine and Control Administration. A quarantine against insect pests and diseases of plants from abroad has been established and maintained, inspectors having been stationed at every port of entry by land and sea. It would not be surprising, with the opportunities afforded, if, in spite of this vigilance, now and then a foreign pest should make its entry undetected, for they are often exceedingly elusive in the method of their introduction. However, with the exception of the pink bollworm, which gained entrance from Mexico before its lodgment there was discovered, no important pest is known to have become established in the United States since the enforcement of the act.

Not the least important work of the Control Administration are the quarantines established and maintained within the United States against the spread of a number of our most important pests. The investigation work is carried on by the Federal Government through the Bureau of Entomology, which in 1924 had 83 field stations in 32 States and Territories and 3 foreign countries. In the States, the work is conducted by the experiment stations, State entomologists, and, in several instances, by crop pest commissions. The State experiment stations have conducted investigations on hundreds of projects and have maintained vigilance and afforded local aid in control. The interstate spread of pests has been prevented to a large extent through State regulations requiring that nursery stock be free from infestation, and these are enforced by rigid State inspection.

**Gipsy Moth.** The gipsy moth was introduced by accident from Europe into Massachusetts about 1861. Work against it has been carried on since the early nineties, at first by the State of Massachusetts alone and since 1901 by the Federal Government and the States, but it has continued its spread. Encouraging results, however, have been obtained in work with native and introduced parasites. Investigations have shown that the natural spread of this moth, the female of which is wingless, takes place in large part through young caterpillars' being carried by high winds. The pest in 1914 was entering the eastern border of New York State in the course of its spread, and a barrier zone was established some 25 miles wide extending from Long Island Sound northward and up the Hudson Valley to the Canadian border. More recent accidental introductions of the pest on nursery stock have been successfully eradicated, except that of 1910 in New Jersey, where work was under way in 1928, with every prospect of its early eradication in that State.

**Brown-tail Moth.** The brown-tail moth is another defoliating pest which was accidentally

introduced into the United States, near Boston, from Europe. Since its introduction, about 1892, it has spread as far north as Nova Scotia and covers practically all of New England. The moth takes its name from the tuft of golden brown hairs at the tip of the abdomen. In the early fall, the young caterpillars spin tents at the end of twigs, incorporating leaves, in which they spend the winter, these tents being very conspicuous after the leaves fall. In the spring, the caterpillars leave the tents and feed on the foliage until June, when their development is completed. In addition to its injury from defoliation, it is a source of great annoyance from the hairs of the caterpillar, which break off at molting time and, being carried through the air, produce a painful rash. Its control is aided by cutting off and removing the tents in winter, by the application of arsenate of lead, and by parasites, many of which also attack the gipsy moth.

**Pine-shoot Moth.** The destructive pine-shoot moth was found in 1914 to have been introduced from Europe and to have become established in 10 localities in three States from Massachusetts to Pennsylvania, and the following year it was recorded from 20 localities in nine States, and by 1928 had become quite abundant in some localities.

**Codling Moth.** Investigations of this insect, which is responsible for the greater part of our wormy apples and pears, and which also attacks the so-called English walnut, causing a loss estimated at \$20,000,000 annually, led to increased activity in the dissemination of information as to the proper dates to apply arsenicals.

**Oriental Peach Moth.** The Oriental peach moth, which attacks the terminal twigs of the peach, plum, and cherry, stunting their growth, and which also infests the fruit of the peach and quince and to a lesser extent the apple, was first discovered in the District of Columbia in 1916. By 1928 it had spread as far north as Connecticut and Rhode Island, south to Florida, and west to Arkansas and Missouri. It is supposed to have been introduced with flowering cherry trees from Japan.

**Peach Borer.** This destructive borer in the lower trunk of the peach tree was quite effectively controlled by the use of paradichlorobenzene placed about the trunk and kept covered with soil for several weeks. The gas escaping from the chemical enters their galleries in the tree and destroys the borers.

**Pear Thrips.** The pear thrips, which for many years has been the source of serious injury to deciduous fruits through attacking the blossom, particularly of pears, prunes, and cherries, in the Santa Clara Valley, Calif., and later appeared in British Columbia, was discovered in New York State in 1911 and has become of considerable importance in the Hudson River Valley fruit belt. In 1915 it appeared in Maryland and was a source of injury in the vicinity of Baltimore.

**Japanese Beetle.** The green beetle *Popillia japonica* was introduced from Japan with nursery stock and became established near Riverton, N. J., where it was discovered in the summer of 1916. The beetle attacks the foliage of many kinds of fruits, vegetables, and ornamental plants, and the larvæ feed on the roots of plants and on decaying vegetable matter. Investigations of its biology and control have been con-

ducted and a quarantine has been established to aid in preventing its dissemination. It continued to spread, however, and by 1928 it had appeared as far east as Massachusetts and Connecticut, south in the District of Columbia, and west at Sayre, Pa.

**Mexican Bean Beetle.** The bean beetle, which originated in Mexico but has occurred endemically in the southwestern United States for 75 years, appeared near Birmingham, Ala., in July, 1920, spread rapidly, and became of great economic importance as an enemy of beans of all kinds through its defoliation of the plants. By 1928 it had spread as far north as Michigan and New York and had reached the Atlantic seaboard in North Carolina, Virginia, and Maryland.

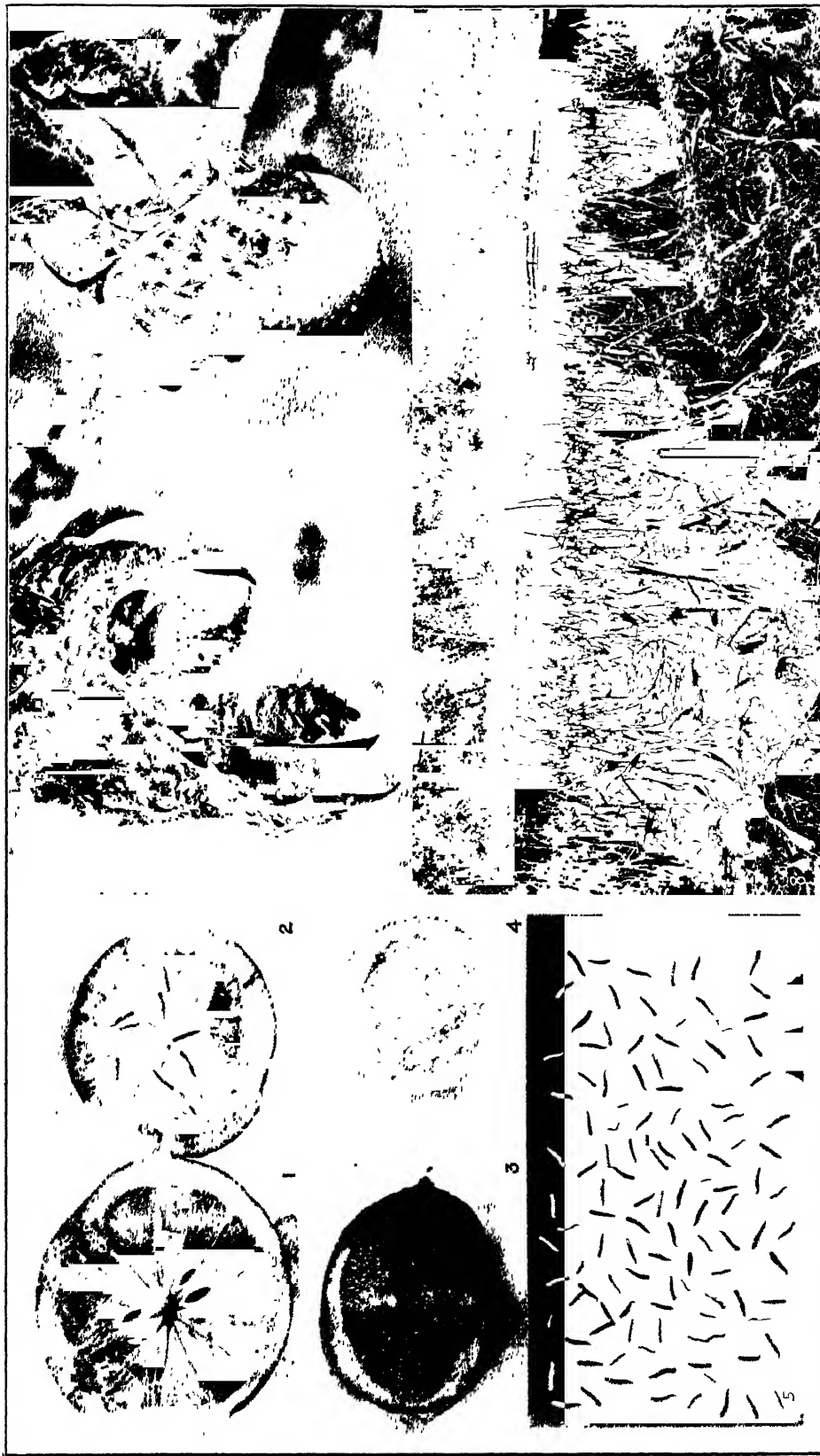
**European Corn Borer.** This widely distributed European and Asiatic pest was discovered in 1917 in eastern Massachusetts, where it probably had been introduced in shipments of broomcorn from Europe. It appeared later in the Hudson Valley in New York, in southern Ontario, western New York, and northeastern Pennsylvania, whence it spread westward into Ohio and Indiana and by 1927 threatened to invade the whole Corn Belt. This borer, the larva of a moth, attacks all of the corn plant above ground except the leaf blades, channeling out the pith of the stalks of field and sweet corn and through the ears and into the kernels. The tassels and upper part of the stalks are weakened and often break over. There are two generations in New England, but in New York and the more western infestations there is generally but one. The winter is passed as a nearly mature or full-grown larva in burrows in the stubble or stalks near the ground, cobs, and the stems of other food plants of which it has a large number.

Much was accomplished in preventing its spread through the quarantining of infested areas and restricting transportation without such areas of materials in which it might be carried. An extensive clean-up demonstration and campaign of education was conducted in 1927 under a 10-million-dollar appropriation by Congress. This effort led to the perfection of machinery for the cutting and shredding and the plowing under of the corn stalks which serve as effective means of combating the pest.

**Cotton-boll Weevil.** The boll weevil, which entered Texas in the vicinity of Brownsville about 1892, continued its spread and by 1924 had occupied practically all of the old cotton-growing area of the United States. Appropriations made by Congress for investigations and control work with it have amounted to more than \$1,500,000. As a result of the extensive investigations, a highly toxic, finely divided calcium arsenate has been prepared, which is applied in a dust with high-powered dusting machines constructed for the purpose. The use of the airplane was found economical in the dusting of large fields and by 1925 the arsenical treatment was applied in that way to some 150,000 acres.

**Thurberia or Arizona boll weevil.** In 1913 a variety of the boll weevil that is resistant to arid conditions was discovered in Arizona living on a wild cotton-like plant of the genus *Thurberia*. From this host plant growing in the canyons, it spread to the cultivated cotton now grown under irrigation and threatens to become as great a pest of such cotton as the





1. Mediterranean Fruit Fly Affecting Lemon. 2. Orange. 3. Lemon. 4. Mandarin. 5. Larvæ. 6. Japanese Beetle Feeding on Peach and Foliage. 7. Japanese Beetle Feeding on Apple. 8. Field of Sweet Corn Severely Infested by European Corn Borer.



common boll weevil is of cotton grown under the customary humid conditions.

**Pink Bollworm.** In November, 1916, the occurrence of the pink bollworm in the Laguna district of Coahuila, Mexico, within 200 miles of the Texas border, was discovered, and an embargo was placed upon the importation of Mexican cotton. It was found the following year that the larvæ had been introduced in carloads of cottonseed shipped from Mexico before the quarantine in November, 1916, infestations being found at points in several counties in Texas and Louisiana. The infested areas were at once quarantined and eradication work was pressed with vigor under appropriations by Congress, apparently with success. From the infestation in the Big Bend area of the Rio Grande, it has spread along the Rio Grande and Pecos valleys in western Texas and southern New Mexico and into southeastern Arizona. It appeared in the spring of 1928 in seven new counties in western Texas on the edge of the main Cotton Belt. In order to prevent its entrance, houses have been erected at ports of entry on the Mexican border for the fumigation of freight cars from Mexico where they may have served as carriers of cotton and cottonseed, and all cotton from abroad has been fumigated in large cylinders with hydrocyanic acid gas in vacuum in order to destroy any larvæ present.

The pest has been introduced into Brazil, as well as Mexico, with seed, it being estimated to have caused a loss of \$27,500,000 in Brazil in 1918. It was introduced into the Hawaiian Islands about 1908 and was discovered in Porto Rico in 1921, where it has spread throughout the island. This moth, which originated in India and is now a source of great loss in Egypt, whence it has spread to other cotton-producing countries, and which constitutes one of the greatest menaces that have ever come to the American cotton industry, had not previously been known to occur in America, although prevalent in practically all of the other cotton-producing regions of the world, in all of which it has caused widespread destruction.

**Alfalfa-leaf Weevil.** This European insect, accidentally introduced into the United States and first discovered in Utah in 1902, continued to spread and by 1929 had become the source of considerable injury in Colorado, Idaho, Nevada, and Wyoming, as well as in Utah, and was entering California, Oregon, and Nebraska. Appropriations by Congress led to control work, in which particular attention was given to the introduction of insect parasites, one of the 10 species introduced from Europe killing as high as 90 per cent of the weevil larvæ in many localities.

**Argentine Ant.** This enemy of field crops, fruits, stored products, household supplies, etc., which was first discovered in the United States at New Orleans in 1891, continued to spread, and colonies were known to be established as far distant as Georgia, Texas, and California.

**Mediterranean Fruit Fly.** This destructive enemy of no less than 80 different subtropical fruits and vegetables, especially citrus fruits and particularly the orange, was first discovered in Hawaii on the Island of Oahu in 1910. Since that time, it has increased rapidly and spread into other islands. Control work has led to the introduction of a number of parasites, several of which are responsible for a considerable re-

duction in its infestation. This fruit fly has been the most serious drawback to fruit growing in the countries where it is established, its introducing into Bermuda many years ago having resulted in the destruction of the fruit-growing industry of that island. In order to combat and aid in preventing its introduction into the United States on the mainland, several emergency appropriations have been made by Congress, and all means for prevention are being employed by the inspection service of the Federal Plant and Quarantine Administration, the Plant Quarantine Act having made it possible to establish and maintain a quarantine against it. The first invasion of Continental United States by this cosmopolitan enemy of fruits and vegetables was discovered in Florida on Apr. 6, 1929. Funds for use in combating the pest with a view to its eradication were at once made available by both State and Federal governments. The extent of the infested area in central Florida was quickly determined and placed under quarantine.

**Other Insects.** Among other insects which have been introduced or become of great economic importance are the European red mite, first discovered in Canada in 1915 and a source of injury through its attack upon the leaves of the apple, plum, etc., in the northeastern United States; the Mexican fruit fly, which appeared in Texas in 1927; the European earwig, which first appeared in Rhode Island in 1911 and in Washington State in 1915 and is a source of injury to garden plants and flowers; the poplar defoliating satin moth, from Europe, which was first discovered near Boston, Mass., in July, 1920, and in Washington State in 1922; the Australian tomato beetle, first observed in Mississippi in 1921 and in California in 1926; the camphor thrips, first discovered in Florida in 1912; the pea moth, which is increasing in importance in Wisconsin; the sweet-potato weevil, which was first discovered in this country in 1875 but which began to spread and increased in importance about 1920; the fruit-tree-leaf roller, which has increased in importance due to its resistance to insecticides; the potato-leaf hopper, which causes tipburn of the potato; the cotton flea hopper, an active insect which first appeared as a serious pest of cotton about 1920; and others.

**Control Measures.** A notable advance has taken place in the knowledge of biological, insecticidal, mechanical, and other means of insect control. Search has been made and parasites of a considerable number of pests have been discovered and introduced from foreign lands. New insecticides have been discovered, and others have been adapted for more efficient control. Notable among the new insecticides is paradichlorobenzene, which has been successfully used in the control of the peach-tree borer. The lubricating oils have been found to form emulsions that are highly effective against scale insects on citrus, the San José scale, etc. New forms of arsenicals have been perfected, notably calcium arsenate in dust form, as employed in combating the boll weevil, sodium fluosilicate which is more toxic for some insects than are the arsenicals, Bordeaux oil emulsion spray for citrus insects, etc. Nicotin applied in a dust form has proved very effective as a means of control of the walnut aphid and a large number of other pests. Borax has been found to be effective, economical, and practical in the de-

struction of fly larvæ in horse manure, and hellebore is also effective for this purpose. Corrosive sublimate has been found to be highly effective against root maggots. New methods of preparation and application of cyanide gas for combating citrus pests have been developed. The commercial manufacture of cyanide dust has led to its extensive use as an insecticide. New mechanical developments include the use of the airplane in applying dusts for control of the boll weevil, gipsy moth, etc. New machines for the application of sprays and new hand and power dusters have been invented or improved, and numerous mechanical devices have been developed.

**Apiculture.** Investigations of bee diseases, the greatest handicap with which the beekeeper has had to deal, resulted in a number of discoveries of great importance. A disease of the brood which has often been mistaken for one of the foul broods and to which the name "sacbrood" is given has been found to be due to a filterable virus. The deadly Isle of Wight disease of the adult bee, occurring in Great Britain and on the Continent, was discovered to be caused by the mite *Acarapis woodi* in the tracheæ, and an embargo has been placed upon the importation of bees in order to prevent its introduction into the United States.

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**ENVER PASHA** (1882-1922). A Turkish soldier born at Constantinople and one of the first leaders of the Young Turk movement. In 1908 he led the revolutionary movement which forced the Sultan to restore the Constitution of 1876. In the same year, he was appointed military attaché at Berlin. In 1909 he helped put down a counter revolution and to depose the Sultan. He served in the army during the Italo-Turkish War (1911). In 1913 although not in the Government, he was active in the *coup d'état* caused by the humiliating peace terms, and in the following year he became minister of war. He appointed himself chief of the general staff, and started a thorough reorganization of the army. His appointment of the German general, Liman von Sanders, as a Turkish commander nearly caused an international incident. Throughout the World War, he remained in control of the army and it was largely due to his influence that Turkey allied herself with Germany. At the close of the War, he was charged with profiteering, and fled to escape death by a Turkish court martial. He became active in Soviet Russia as a leader against the various "white" generals, but in 1922 the Bolsheviks announced that he had betrayed them. He immediately started an anti-Soviet movement in Bokhara and was killed there on August 4 in a battle with Soviet soldiers.

**EPILEPSY.** Experience with epilepsy in soldiers during the World War confirmed the belief that all manifestations which come under this head may have a common origin; yet it became increasingly difficult to distinguish between primary and secondary or symptomatic epilepsy. Cranial injuries were found able to give rise to any or all of the clinical expressions of the disease; in some cases, the malady does not appear until more than a year after the injury. Nor did it appear necessary for the sufferer to have a strong hereditary predisposition to the disease; as a matter of fact, the medical selection of troops automatically eliminated many degenerate individuals.

Attempts have been made to bring epilepsy within the domain of psychoanalysis on the ground that the disease had a subconscious mental factor. Dr. Pierce Clark of New York published many articles to show that these patients are sometimes improved by psychoanalysis. The most sensational advance in connection with epilepsy was the introduction of the synthetic drug, luminal, allied in composition with veronal. The public was cautioned not to expect too much from this innovation, but it seems certain that it could very largely replace bromides with none of the severe constitutional effects of the latter. The dose, which is small, need not be increased to hold its effect; indeed, it is too powerful to warrant any attempt to increase it. Since 1920 this drug has been tried out very thoroughly; most reports were distinctly favorable. It also may be used to spare bromides and thus diminish the likelihood of bromide intoxication.

Another outstanding advance in the subject of epilepsy during recent years is undoubtedly the beneficial effects of a special diet, known as the ketogenic, of high fat and low carbohydrate composition. This is based on the fact that the acidosis or ketosis which results from starvation has a distinctly beneficial action on the seizures. The ketosis may be produced by the diet in question without any necessity for fasting;

and while in theory ketosis is a pathological state, its ability to arrest the fits over long periods in some epileptics has been demonstrated. While in some cases there is improvement, a considerable number remain quite refractory, this indicating that epilepsy may be due to very different causal factors. The greatest improvement was seen in children, and for several years only child cases were reported; but quite recently it has been found to be of no little value in adults. It will of course remain to be seen whether there are late relapses in the arrested cases, whether the treatment can be carried out on a large scale and is free from ill consequences. It has been shown recently that a mineral acidosis produced by certain inorganic salts will also arrest seizures, although in time the body seems to adapt itself to the treatment and the fits reappear.

**EPINEPHRIN.** See ADRENALIN.

**EPSTEIN, JACOB** (1880- ). An English sculptor (see VOL. VIII). Of extraordinary technical resourcefulness, he follows the traditions of dramatic sculpture by working with ridges and bosses rather than by the architecture of his planes. He is peculiar in the vehement violation of actuality in the individual head. His later works include "Christ," a very radical conception which caused much controversy; "The Sun God"; a series of powerful portrait heads, including Admiral Lord Fisher (Imperial War Museum, London); the bronze "American Soldier," Metropolitan Museum, New York; several versions of Mrs. Epstein; the Duchess of Hamilton, and a number of others in the collection of John Quinn, New York; the memorial to W. H. Hudson in Hyde Park, London (1925); "Study for a Visitation" (1926), in the National Gallery, London; and "Night" and "Day" (1929), two figures carved on the face of the boundary wall of the new Underground offices over St. James's Park Station, London. Consult the monograph by B. Van Dieren (London, 1920).

**ERB, NEWMAN** (1850-1925). An American railway official, born in Breslau, Germany. In 1853 he moved with his parents to the United States. He was educated privately and in the public schools of St. Louis. From 1886 to 1898, he was president of the Western Telegraph Company. He was president and receiver of several important railroads in the West and South, constructed and was president of the St. Louis, Memphis & Southeastern Railroad and was president and director of the Wisconsin Central Railroad in 1908-09. He was president of the Minneapolis & St. Louis Railroad and the Iowa Central Railroad for several years and was a director and official in many important corporations, chiefly connected with railways.

**ERDMAN,  rd'm n, CHARLES ROSENBURY** (1866- ). An American theologian born at Fayetteville, N. Y., and educated at Princeton University, and the Princeton Theological Seminary. He was ordained in the Presbyterian ministry in 1891 and, after serving various pastorates, returned to the seminary at Princeton as professor of practical theology in 1906. He has been a delegate to Presbyterian conventions and world assemblies, was Moderator of the General Assembly of the Presbyterian Church, U. S. A., in 1925, and in 1926 was elected president of the Presbyterian Board of Foreign Missions. He is the author of *The Railway Rider* (1904); *Sunday Afternoons with Railroad Men* (1907);

*Coming to the Communion* (1912); *Gospel of John, an Exposition* (1916); *The Gospel of Mark, an Exposition* (1917); *The General Epistles* (1918); *The Acts* (1919); *Matthew* (1920); *Luke* (1921); *Within the Gateways of the Far East* (1922); *Return of Christ* (1922); *Pastoral Epistles* (1923); *The Lord We Love* (1924); *The Spirit of Christ* (1926).

**ERDMANN, BENNO** (1851-1921). A German philosopher (see VOL. VIII). His last work, *Grundr ge der Reproduktionspsychologie* (1920), concerned itself with the movement of thought and imagination.

**ERGOSTEROL.** See FOOD AND NUTRITION.

**ERIE.** A manufacturing and summer-resort city of Pennsylvania. The population rose from 66,525 in 1910 to 102,093 in 1920 and, according to local estimate, to 135,000 in 1928. City planning and zoning are highly developed, with a commission actively engaged in approving plans for future developments. A union passenger station, costing more than \$2,500,000, was completed in 1928, and is the first step in the development of the Civic Centre, consisting of the station, the proposed station plaza park, Griswold Boulevard, and the proposed Government post office, for which appropriation has been made by Congress. The public stadium, which has a seating capacity of 25,000, was erected in 1924 by popular subscription. A sewage-disposal plant, costing more than \$1,000,000, a garbage- and refuse-disposal system, and a storm-water sewer system are under construction. Presque Isle Peninsula, including about 3200 acres which form a protecting arm before the harbor, has been set aside as a State park and is being rapidly developed into one of the finest National parks in the East. Erie is one of the most active ports on the Great Lakes in the handling of grain and other freight. A passenger line connects it with Port Dover, Ontario. The assessed valuation of property in Erie in 1928 was \$142,674,027; the net indebtedness was \$8,084,507.

**ERITREA.** An Italian colonial possession in Africa on the west coast of the Red Sea. Area, 45,754 square miles; native population by census of 1921, 402,793. Europeans numbered 4251; of these, 3901 were Italian. Asmara, the seat of government, had 14,711 inhabitants, including 2500 Europeans; Massawa, the leading port, 12,275, with 137 Europeans. The export trade by sea comprises dried hides, palm-nut seeds, tinned meats, salt, mother-of-pearl, conch shells, flaxseed, rubber, and tanning materials; the sea-borne import trade, wines, cotton and cotton goods, mineral oils, cement, sugar, coffee, fats, and soap. Imports in 1927 were valued at 201,360,446 lire; exports, at 80,196,371 lire. The land transit trade in 1927, principally with Abyssinia, was valued at 58,413,398 lire in imports and 36,635,287 lire in exports. At Massawa, 628,104 tons of shipping entered in 1927. After 1912, 65 miles of railway were completed from Asmara to Cheren, by the end of 1928, the line from Cheren had reached Agordat (54 miles). At Massawa Assab, and Asmara, wireless stations have been established to keep the colony in constant communication with Italian Somaliland and Italy. For the financial year 1928-29, the revenue and expenditure of the colony were estimated at: Colonial revenue, 42,482,300 lire; expenditure, civil, administration, 25,497,050 lire; military, 16,985,250 lire. Efforts to attract Italian set-



tlers proved unsuccessful, because the highlands, the only areas suitable for European colonization, were already well filled by Abyssinians. The colony is not yet self-supporting.

**ERIVAN, ARMENIAN REPUBLIC OF.** See ARMENIA.

**ERMAN, ē'r'mān, HEINRICH** (1857- ). A German jurist, born in Berlin and educated at the universities of Leipzig and Berlin. In 1883 he was appointed professor at Lausanne, and was subsequently professor of Roman law in Geneva. He was made honorary professor at Lausanne in 1902, and later at Münster-in-Westfalen. His works include: *Zur Geschichte der römischen Quittungen und Solutionsakte* (1883); *La Restitution des frais de procès en droit romain* (1892); *Servus vicarius, l'esclave de l'esclave romain* (1896); *Recht und Prätor* (1903); *Bedeutung der Bodenreform für eine aufstrebende Stadt* (1907); *Behandlung der Aktionen in den nachklassischen Rechtsbüchern* (1908); *Grundzüge für ein Kriegerheimstättengesetz* (1916); and *Völkssiedlungen* (1925).

**ERMATINGER, ēr-māt'ing-ēr, EMIL** (1873- ). A Swiss author and professor at the University and Technical High School of Zurich, born at Schaffhausen. He studied law and philosophy at Swiss universities, but later devoted himself to teaching and writing. He wrote *Jenseits des Tages*, verse (1900), and several novels, among them *Weggefährten* (1902) and *Der Weg ins Leben* (1909), but was best known for his critical, biographical, and historical works, which were: *Antike Lyrik in modernem Gewande*, with R. Hunziker (1898); *Die Weltanschauung des jungen Wieland* (1907); *Gottfried Kellers Leben, Briefe und Tagebücher* (3 vols., 1915); *Die deutsche Lyrik in ihrer geschichtlichen Entwicklung* (1921); *Das dichterische Kunstwerk* (1921); *Wieland und die Schweiz* (1924); *Weltdeutung in Grimelshausens Simplicissimus* (1925); *Barock und Roko in der Deutschen Dichtung* (1926), and *Krisen und Probleme in neueren deutschen Literatur* (1927).

**ERNLE, ROWLAND EDMUND PROTHERO, FIRST BARON** (1852- ). An English economist, born at Clifton-on-Teme. He was graduated from Balliol College, Oxford, in 1873, and was connected with that university as fellow and proctor until 1891. From 1894 to 1899, he edited the *Quarterly Review*. In 1913 he was a member of the Royal Commission on Railways. He represented the University of Oxford in Parliament (1914-19), in 1915-16 was a member of important committees on the production of food, and from 1916 to 1919 was president of the Board of Agriculture. He was president of the English Association (1921-22), and became an honorary fellow of Balliol College in 1922. He was made a baronet in 1919 and received honorary degrees from Oxford, Athens, and Wales. His writings include: *Pioneers and Progress of English Farming* (1887); *Life and Correspondence of Dean Stanley* (1893); *Letters of Edward Gibbon* (1896); *Letters and Journals of Lord Byron* (1898-1901); *The Psalms in Human Life* (1903); *The Pleasant Land of France* (1908); *English Farming, Past and Present* (1912); *The Land and its People* (1925); *The Light Reading of our Ancestors* (1927).

**ERNST, OTTO.** See SCHMIDT, OTTO ERNST.

**ERNST, PAUL** (1866- ). A German writer of essays, dramas, and fiction, born at Elbingen. He studied at the universities of Göttin-

gen, Tübingen, Berne, and Berlin. In his first efforts, the one-act plays *Lumpenbagasch* and *Im chambre séparée* (1898), he was influenced by the naturalism of Arno Holz, but later found himself in the volume of poems *Polymeter*, the two one-act tragedies *Wenn die Blätter fallen* and *Der Tod* (1899), and the volume of fiction, *Sechs Geschichten* (1900). After a sojourn in Italy, he published some translations, *Altitalienische Novellen* (1902), selections from *Des Knaben Wunderhorn* and a special edition of Arnim's *Isabella von Ägypten* (1903). He wrote a number of novels—*Die Prinzessin des Ostens*; *Der schmale Weg zum Glück* (1903); *Der Tod des Cosimo* (1912); *Die Hochzeit* (1913); *Saat auf Hoffnung* (1915); *Die Taufe* (1916); *Der Nobelpreis* (1917)—a volume of short stories, *Komödiantengeschichten* (1920); and a drama, *Preussengeist* (1915). His books of essays, *Der Weg zur Form* (1906) and *Der Zusammenbruch des Idealismus* (1919), attracted much attention. His later works include a volume of imaginary conversations *Erdichtete Gespräche* (1920); some occult stories, *Okkultistische Novellen* (1921); *Zusammenbruch und Glaube* (1922); *Das Kaiserbuch* (1923); *Geschichten aus dem Süden* (1925); and *Der Schatz im Morgenbrotstal* (1926).

**ERSKINE, JOHN** (1879- ). An American university professor of English (see VOL. VIII). He published: *The Moral Obligation of the Intelligent, and Other Poems* (1915); *The Shadowed Hour* (1917); *Democracy and Ideals* (1920); *The Kinds of Poetry* (1920); *Collected Poems* (1922); *The Literary Disciple* (1923); *Sonata, and Other Poems* (1925); *Private Life of Helen of Troy* (1927); *Prohibition and Christianity* (1927); *Penelope's Man* (1928); *The Delight of Great Books* (1928). He has edited various works and was educational director of the American Expeditionary Forces during the World War, and received the Distinguished Service Medal. In 1927 he became president of the Juilliard School of Music in New York.

**ERVINE, ēr'vin, ST. JOHN GREER** (1883- ). An Irish dramatist and novelist, born at Belfast. His first play, *The Magnanimous Lover* (1907), possessing a distinctly moral flavor, was produced at the Abbey Theatre, Dublin, in 1913. Two years later he was manager of the same theatre. He is the writer said by Arnold Bennett to be "probably unequaled by any other playwright" in England, who had in his work "combined great skill, fine ideas, and perfect sincerity with immense popular success." In 1928-29 he was dramatic critic of *The World* (New York). He wrote the following plays: *Mixed Marriage* (1910); *Jane Clegg* (1911); *Four Irish Plays* (1914); *John Ferguson* (1914); *The Wonderful Visit*, with H. G. Wells (1921); *The Ship* (1922); *Mary, Mary, Quite Contrary* (1923); *The Lady of Belmont* (1924); *Anthony and Anna* (1925), and *Four One-Act Plays* (1928). His other publications include the novels *Mrs. Martin's Man* (1915), *Alice and Family* (1915), *Changing Winds* (1918), *The Foolish Lovers* (1920), *The Wayward Man*, and *The Mountain* (1928); the tales *Eight o'Clock and Other Studies* (1913), and *In Inland Seas* (1928); the political studies *Sir Edward Carson and the Ulster Movement* (1915), and *Parnell* (1925); and *The Organised Theatre; a Plea in Civics* (1924); and *How to write a Play* (1928).

**ERYSIPELAS.** This affection although not deadly save in certain types of case is of com-

mon occurrence and causes much disability and hospitalization. A specific treatment should not only save some life but should also cut short the usual period of disability and internment. Quite recently Dr. Birkhaug of Rochester, N. Y., perfected an antitoxin which at first appeared to give superior results although later experience seems to have thrown some doubt on its value. However, in Bellevue Hospital, New York, which is believed to have the greatest erysipelas contingent in the world, the results have been more than satisfactory. Dr. Symmers, who reports his experience in the *Journal of the American Medical Association* for Aug. 25, 1928, has tested the serum in hundreds of cases, is most enthusiastic over its efficacy and pronounces it a great advance. The only drawback, if such it can be termed, is the absence of any immunizing factor; for apparently the discharged patients can readily contract the disease anew. The total number of cases thus far treated in Symmers's Bellevue service is over 700 and the mortality was 5 per cent for facial and only 8.4 per cent for corporeal erysipelas (which may reach 40 per cent at times); the average duration of hospital sojourn was much reduced.

**ERZBERGER**, ər'z'bər-gēr, MATTHIAS (1875-1921). A German politician, born at Butthausen (Württemberg). He began his career as a school-teacher, then was a journalist, becoming a member of the staff of the *Deutsches Volksblatt* (Stuttgart) in 1896. His political career began in 1903, when he was elected to the Reichstag as representative of the Catholic Centre Party. During the World War, he at first made extravagant efforts to increase German annexations, but later became just as active in furthering peace negotiations. It was he who instigated the "Peace Resolutions" drawn up by the Reichstag in 1917; and when, in 1918, he succeeded Bethmann-Hollweg as Secretary of State, he conducted the Armistice negotiations and signed the agreement on November 11. Becoming Finance Minister of the Reich in 1919, he was forced to resign on account of a legal controversy with Dr. Helfferich, the Nationalist leader. The Conservatives and National Liberals criticized him not so much for his peace negotiations as for his financial policy, which hit capital and landed interests. His supporters were the Catholic working classes. The culmination of the attacks upon him was his assassination on Aug. 26, 1921.

**ESENWEIN**, JOSEPH BERG (1867- ). An American editor, born in Philadelphia, and educated at Albright College, Millersville Normal School, Lafayette College, Richmond College, and the University of Omaha. He was president of Albright Collegiate Institute in 1895-96 and later became professor of English in the Pennsylvania Military College at Chester, subsequently giving up teaching (1903) to become manager of the *Booklovers' Magazine*. Two years later, he was made editor and manager of *Lippincott's Magazine*, a position which he held until 1914. In 1915 he became editor of *The Writer's Monthly*, Springfield, Mass. He is known both as a lecturer and writer. His published works, besides articles contributed to Charles Dudley Warner's *Library of the World's Best Literature*, include: *Songs for Reapers* (1895); *Modern Agnosticism* (1896); *Feathers for Shafts* (1897); *Short Story Masterpieces* (1912); *Children's Stories and How to*

*Tell Them* (1917); *Russian Short Story Masterpieces* (2 vols., 1919); *Writing Good English* (1925).

**ESHER**, REGINALD BALIOL BRETT, SECOND VISCOUNT (1852- ). An English politician and author, born in London and educated at Eton and Trinity College, Cambridge. He was a member of Parliament from Penryn and Falmouth (1880-85), secretary to the Office of Works (1895-1902), chairman of the War Office Reconstitution Committee (1904), and a permanent member of the Committee of Imperial Defense. He was deputy governor of Windsor Castle from 1901 to 1928, when he became governor. King Edward VII appointed him one of the editors of *The Correspondence of Queen Victoria* (1907). Among his publications are *Footprints of Statesmen* (1892); *To-day and To-morrow* (1910); *Influence of King Edward*, Essays (1914); *After the War* (1918); *The Tragedy of Lord Kitchener* (1921); *Ionious* (1923); and his reminiscences, *Cloud Cap't Towers* (1927).

**ESKIMOS**. See ALASKA, under *Natives*; **ETHNOGRAPHY**, under *North America*.

**ESPERANTIDO**. See INTERNATIONAL LANGUAGE.

**ESPERANTO**. See INTERNATIONAL LANGUAGE.

**ESPINA**, CONCHA (1879- ). A notable Spanish woman novelist. Born in Santander, where she published verses in the daily *El Atlántico* while still a girl, she went in early youth to Chile. On her return to Spain, she continued to write for Spanish-American papers, but she had long since turned to prose as her usual medium of expression, and she has developed therein a limpid, flexible, vibrant style with which she seems to be able to do everything she will. Her works have brought her prize after prize, the Royal Spanish Academy alone having awarded her the prizes known as Fastenrath, Espinosa Cortina, and Castillo de Chirel. In 1929 she was visiting professor at the Middlebury, Vt., Spanish School. The Hispanic Society of America (of which she is a corresponding member) has awarded her its medal for Arts and Letters. Among her best works (many of which have been translated into several languages) are *Mis flores* (poems, 1904); *Trozos de vida* (articles and stories, 1907); *La niña Luz-mela* (1909); *Despertar para morir* (1910); *Agua de nieve* (1911); *La espinja maragata* (1914); *La rosa de los vientos* (1916); *Ruecas de marfil* (1917); *El jayón* (drama, 1918); *Pastorelas* (1919); *El metal de los muertos* (1920); *Dulce nombre* (1921); *Ouentos* (1922); *Simientes* (1923); *El odio rojo* (1924); *Tierras del Aquilón* (1926); *Las niñas desaparecidas* (1927); and *La virgen prudente* (1929).

**ESTAUNIE**, ɛs'tɔn'ɛ', EDUARD (1862- ). A French author and engineer who was born in Dijon and educated at the Jesuit school there, the Lycée Saint-Louis, and the École Polytechnique. He was director of the École Supérieure de Télégraphie, and of material and construction at the ministry of posts and telegraphs. In 1923 he was elected to the French Academy. His novels showed keen psychological insight and were usually deeply thoughtful. They include *Un Simple* (1890); *L'Empreinte*, crowned by the Academy (1896); *L'épave* (1902); *La vie secrète*, Prix de la Vie Heureuse (1908); *Les Choses violent* (1913); *L'Ascension de M. Baslèvre* (1918); *L'Appel de la route* (1921);

*Le Labyrinthe* (1923); *Le Silence dans la campagne*, short stories (1926), and *Tels qu'ils furent* (1927). He also wrote *Petits-Maitres*, art criticism (1893); *Les Sources d'énergie électrique* (1895), and *Traité pratique de télécommunication* (1904).

**ESTELLA**, MARQUÉS DE. See RIVERA Y ORBANEJA, PRIMO DE.

**ESTONIA**. A republic on the Baltic Sea, made up of the former Russian government of Estland, the northern part of Livland, the islands Saaremaa, Hiiumaa, and Muhumaa, and parts of the Petseri district of the Pskov government and the Gdowski district of the Petrograd government. Estonia became a republic on Feb. 24, 1918, after the Bolshevik *coup d'état*. By Treaty of Tartu with Russia on Feb. 2, 1920, and by an agreement with Latvia, her sister republic to the south (Nov. 1, 1923), Estonia's political borders were extended to coincide with her ethnographic limits. The area is put at 18,354 square miles, and the population, Jan. 1, 1928, 1,117,270; estimated, 1928, 1,115,094. Of these, 87.7 per cent were Estonians and the rest Germans, Russians, Jews, Finns, Swedes, and Letts. The capital, Reval, had 160,000 in 1917 and in 1920, 127,000 inhabitants. Narva, the chief manufacturing centre, was credited with a population of 27,975. Five-sixths of the population were Lutherans, and the rest were Greek Orthodox and Roman Catholics.

**Industry.** The great portion of the population works on the land. Up to the passage of the land reform bills of 1919, property was concentrated mostly in the hands of the Baltic barons and the clergy, of German descent; native Estonians were merely farm hands or small peasant proprietors. By the Bill of Oct. 10, 1919, an ambitious programme was projected for the almost complete confiscation of these large estates and their allotment among the peasants and soldiers. Some indemnity was provided for, but the basis was not to be the real value but the size of the land tax. Lack of capital for buildings and deterioration of farm stocks imposed almost insuperable difficulties on the realization of the programme. Of the total area of 10,851,500 acres, forest land, owned by the state, comprised 20.1 per cent; fields, 22.9; meadows, 24.; pastures, 17.5; untillable land, 15. The acreage under various crops and the harvests of 1922 and 1927, compared with the average for five pre-war years, 1910-14, are given as follows:

PRINCIPAL CROPS

Crop	Area in acres		Production in thousands of bushels		
	1922	1927	1910-14 (average)	1922	1927
Rye	392,000	367,000	6,702	5,079	6,735
Oats	595,700	560,000	7,581	9,901	6,727
Barley	331,100	295,000	5,269	6,564	4,335
Wheat	52,200	67,000	257	748	878
Potatoes	186,600	178,000	27,701	25,932	27,253
Flax and flaxseed	59,200	88,000	25,400	17,400	10,634

\* Metric tons.

Live stock in the country in 1927 numbered 224,820 horses, 628,880 head of cattle, 354,000 swine, and 665,510 sheep. There are textile, hemp and rope, paper, metal, and shipbuilding works, but up to 1929 these were languishing because of deterioration and lack of capital.

**Trade.** In 1920 exports were valued at \$17,544,278 and imports at \$19,931,218, similar

figures for 1927 were \$28,207,000 and \$25,713,000. The chief exports in 1927 were: Butter (\$7,377,000); boards and planks (\$2,941,000); raw flax (\$2,760,000); and cotton fabrics (\$2,325,000). The principal imports: Cotton (\$2,406,000); sugar (\$1,894,000); rye (\$1,333,000); and wheat (\$1,093,000). Germany supplied 26.4 per cent of the imports and purchased 29.8 per cent of the exports; the United Kingdom, 12.1 and 31.4; Russia, 7.5 and 6.3; and the United States, 12.0 and 1.2. Commerce for 1928 expressed in kronas (1 kron = \$0.268); imports 1,131,373,000 kronas; exports, 127,109,000 kronas. During 1927, 2672 vessels of 849,996 tons entered the Estonian ports of Reval, Narva, Pernau, Port Baltic, Hapsal, Kunda, Arensburg, Loka, and Kohukala. The total length of railways in 1926 was 1130 miles, all owned and operated by the states.

**Education.** Elementary education is free and compulsory. In 1926 there were 1356 elementary schools, 231 higher schools, 81 gymnasias, several normal schools, a technical school at Reval, and a state university at Dorpat. The last, reopened in 1919, had, in 1926, 4651 students. The minority nationals, Germans, Russians, Swedes, and Letts, are guaranteed instruction in their mother tongues.

**Finance.** In 1922 expenditures were 5,510,300,000 Estonian marks and the revenues, 5,065,300,000 Estonian marks. In 1923 the budget deficit was estimated at 700,000,000 Estonian marks or about 10 per cent of the total expenditures of 6,775,000,000 marks; for 1928-29 the budget balanced at 8,026,661,000, but a surplus was confidently expected. Estonia's national debt, all of which is funded, totaled 11,069,600,000 marks (\$29,667,000) on Jan. 1, 1928; the internal debt was only 64,700,000 marks. The total amount owed to the United States was \$19,717,000.

**History.** The Russian Revolution brought with it a state of uncertainty in Estonia which was not dispelled until late in 1920. Some sentiment inclined toward the Allies; the Baltic lords were openly friendly to Germany. A republican government, proclaimed on Feb. 24, 1918, had but a brief career before it was put to flight by the German troops who entered the country as a result of the Brest-Litovsk Peace Treaty, captured Reval from the Bolsheviks, and restored the Baltic land barons under German protection. A provisional government, set up by the native moderate elements, was disregarded, and German occupation continued until the end of the year. During May, 1918, the Estonian National Council was accorded provisional *de facto* recognition by Great Britain, France, and Italy. By the Russo-German Treaty of August, 1918, Estonia's independence was recognized, but when the Germans withdrew their troops after the Armistice of November, 1918, Soviet forces once more poured in, to be driven out by local troops with Finnish and British aid. The exiled Estonian leaders returned to their war-ridden country, and on May 19, 1919, the National Assembly declared Estonia a sovereign and independent nation. Hostilities with Russia continued until Dec. 31, 1919. Affairs were complicated by the threat of a German movement on the Baltic states and by the intervention of Allied armies on the northwest coast of Russia in the autumn of 1919. The United States, in an endeavor to gain Estonia's support against the Bolsheviks,

offered the country a loan of \$50,000,000, a considerable portion of which was taken. The Russian succession states, Finland, Lithuania, Latvia, and Estonia, wearied of the conflict, and an armistice was signed at Dorpat on Dec. 31, 1919. The Russo-Estonian Treaty of Feb. 2, 1920, put an end to hostilities. The terms were remarkably favorable to Estonia. The country's independence was unreservedly recognized and guaranteed by Russia; Estonia received 15,000,000 gold rubles, all Russian public property in Estonia, and exemption from any share in Russian debts. The Constituent Assembly on June 15, 1920, prepared the country's new constitution. A single house, popularly elected on the basis of proportional representation and controlled by the initiative and referendum, was set up. The cabinet, whose premier was designated the State Head, was to be elected by and responsible to the Assembly. The State Court of Justice was to be elected by the Assembly too. The Assembly, in 1921, had 22 representatives of the Labor Party, 29 of Socialist parties, and 5 Communists, together constituting the majority bloc; 21 Agrarians, and the rest Populists, Christians, Balts, and Russians. By the Land Act, the church was separated from the state and its extensive holdings confiscated.

On June 26, 1921, the Supreme Council of the League of Nations accorded the country *de jure* recognition. Shortly afterward, on September 22, it was admitted to the League. Recognition by the United States was delayed until July 27, 1922. In May, 1923, the election of the second Parliament returned a majority bloc of the bourgeois and peasant parties with the result that M. Paetz, leader of the Peasants' League, was entrusted with the formation of a government.

Russia's consistently friendly policy toward her succession states was further evinced by the series of discussions among the Baltic states, including Estonia, in October and November, 1921, and March and December, 1922. These meetings agreed on arbitration of disputes, confirmation of existing frontiers, agreement on customs, consular, and economic matters; a common economic policy toward Russia, and radical disarmament plans involving the cutting of the Russian Red Army to 200,000. In 1923, it appeared for a time that Estonia was prepared to join with Finland and Poland in an alliance aimed at Russia, but peace was maintained, so that all energies, in 1923 and 1924, were devoted to the solution of domestic problems. Among these, currency stabilization was one of the most needed reforms. On June 20, 1924, a law was passed stabilizing the currency, at 100 Estonian marks to the Swedish gold krona, and providing for an issue on a gold-standard basis at a later time. Steady improvement in the country's finances was evidenced by the balancing of the 1926 budget. In 1925 the debt to the United States was funded, the total being placed at \$13,830,000, the bonds for which were to run over a period of 62 years. The debt to Great Britain also was consolidated. In 1926 the government, with the help of a loan from the League of Nations, planned a further monetary adjustment, and this was brought about in the following year. Beginning Jan. 1, 1928, the currency unit was made the gold kroon, with a content of 0.403226 grams of pure gold. This unit, corresponding to the Scandi-

navian crown, was divided into 100 sents, each sent having the value of a former Estonian mark.

In this period changes of ministry were almost an annual occurrence. In March, 1924, Premier Paetz resigned and was succeeded by Dr. F. Akel, Foreign Minister. Communist agitation marked the whole of the year 1924. In November, 149 Communists were brought to trial and most of them were convicted and sentenced to varying terms of prison. On December 1, following the conclusion of the trial, Communists, in an armed uprising, attempted to seize the Government. There was some fighting, resulting in the killing of the Minister of Ways and Communications, but the outbreak was soon suppressed. M. Akel's government, however, resigned and was succeeded by a coalition of all major parties with Jüri Jaakson as Premier.

In January, 1925, the foreign ministers of Estonia, Latvia, Finland, and Poland held a conference at Helsingfors at which, among other agreements, a treaty of obligatory arbitration was drawn up. A treaty of arbitration was also concluded between Estonia and Germany in 1925. In December, 1925, M. J. Teemant displaced M. Jaakson as head of the state. Among the measures passed by the Diet at this period were one separating church and state and another providing for payment of former landowners for land expropriated in 1919. In December, 1927, the cabinet of M. Teemant in turn gave way to one formed by J. Toennisson, under whom the country on Feb. 24, 1928, celebrated the tenth anniversary of its independence.

A year later, in November, 1928, Premier Toennisson, who was a member of the Right, resigned and was succeeded on December 5 by the Socialist A. Rej, who formed a coalition cabinet. On Feb. 9, 1929, Estonia, together with Poland, Rumania, Latvia, and Soviet Russia signed at Moscow the Kellogg Peace Treaty and, at the same time, signed the "Litvinoff protocol," agreeing to put the treaty into effect as soon as it was ratified by the various parliaments, without waiting for further ratifications by other nations. In April, 1929, an agreement by a mixed commission on a revision of tariff rates between Estonia and Latvia was announced.

**ETHICS.** Recent work in ethics divides itself neatly into two complementary parts, that which may be called scientific and deals with the ways and means of life, and that which is philosophical and deals with ends and values. It is only in the practical solution of the immediate problems of individuals or groups, or in very abstract metaphysical theory, that the two parts are combined.

The former part has followed the method and style of the empirical social sciences and has issued in a summary and organization of their conclusions. Contributing to it, there has been the study of human geography, an account of the effects of climate and other natural conditions on human temperaments and habits. The best-known leaders in such work are Brunhes in France and Huntington in America, both taking their cues from Ratzel in Germany. Following Durkheim in France and Sumner in America, the anthropologists have extended the theory of invention and diffusion of culture patterns. The methods employed in the study of gregarious insects and of investigating primitive human societies have established categories

for the analysis of more highly civilized forms of life, and as a result we have the anthropological survey of our own communities. Levy-Bruhl, Elliot-Smith, Malinowski, and Bas present variants on the main principle which orders social facts, habits, folkways, mores, in evolutionary series within which the laws of chance variation, rivalry, adaptation, and the survival of the fittest hold. Into this theory they have introduced the neo-Marxian hierarchy of tools and their operation, technologies, industries, cultures, and civilizations. The principles of Marxian economic history are thus added to the laws of Darwinian biological evolution, and it is only an extremely unusual social fact that cannot be measured and placed in such a conceptual network. Socialized ways of life, thus accounted for, constitute one class of fundamental gross data for scientific ethics.

The other important class of such data comes from psychology, the types of personality and character that fit into the social groups. Fundamental human uniformities have been found in man's common biological and physiological traits, and differentiations of types and individuals are explained by the conditioned reflexes of the behaviorist and the interplay of complexes of the psychoanalytic school. It has been seen that these two schools of psychology represent the laboratory and the clinic, respectively, and that their conclusions are compatible and complementary, in so far as they provide the atomic data for ethics.

There has been some speculation on the ability of biochemistry to make a further analysis of these units, but so far the results are only programmes of research for such projects as the Institute of Human Relations at Yale University.

So far it has been left to the moral philosopher to apply and evaluate the new theory of human nature. He has chosen the easiest course. It has been easy to subsume the facts under the traditional doctrines of self-realization ethics, provided by the neo-Hegelian idealists, Bradley, Green, Hobhouse, and Westermarck. These doctrines have come down from nineteenth-century philosophies of economics and political science that interpret the facts of human nature as intimations of his ideal destiny. Others have equally persuasively argued that the facts of human nature reveal its inevitable limitations; the mosaic of society is a machine in which individuals are minute parts pushed and pulled by far more inscrutable forces than any divinity ever controlled. This is a pseudo-metaphysics inherited from Spencerian sociology.

The pragmatic school in America sees the separate parts of the machine as instruments to be operated according to human choice for specific ends, and they go on to outline programmes for the social engineer. Dewey's *Experience and Nature* is the best statement of the American faith. In general, the Europeans follow Hegelian or Marxian theories of history and Americans attend to the engineering formulas.

The proponents of these theories have tried to restrict their conclusion, to descriptions of facts, and they disclaim any attempt to prescribe conduct or valuation. Actually, their statements of facts are general genetic laws of human behavior, and as such, they conform to Kant's hypothetical imperatives. Placed in the traditional contexts, they become the rules for an elaborate system of casuistry, the intermediate

proposition required in any application of criteria of value to cases of human conduct. They manifest the relativity which has always been the mark of subjective and highly specialized "philosophies of life."

The claim that empirical generalization is all there is in ethical science is continually made, and, as always, it has the effect of setting up pseudo-absolute standards. So when we turn to the second part of ethical studies in this period, we find one or another set of social facts preferred and vested with authority as a standard for measuring values. A folkway is said to "emerge" from its context and its natural origins, and offers to "natural piety" a "higher" authority. It may have emerged from a temperamental bias, an institutional success, a racial memory, a tragic experience, or as simply a "sport" in social evolution, but as emergent, it takes on the divine right to dictate a code of ethics and demand acceptance. The means become their own end and justify themselves. The natural process leading up to an event becomes a work of art and a ritual, a mystery not to be criticized. This is the dominant mode of thought in England and America where emergent evolution is reducing science to canonical doctrine. In the theory of value, its conclusions can be formulated in the old definition of the good: The good is that which is desired. This means that a thing is good because it is desired. It is an effective evasion of the formal problems in ethics.

The ethical theorists who follow the formal tradition in moral philosophy take the naturalistic and genetic descriptions for granted and attempt to discover the intrinsic character of value. The most important workers in this phase of ethics derive their methods from the Austrian school of economics. For them, the assumption is that the essence of value is an objective *worth*. Corresponding to our judgments of value, there is an objective of which a good thing is a realization. On analysis, this objective turns out to be a Platonic form capable of rigorous logical treatment. The theory of value turns out to be a restatement of scholastic ethical theory without the specialized theological or ecclesiastical bias. This theory originates with Brentano and Meinong in Austria, and is being developed by Rickert and Husserl and their followers in Germany. Its influence has been growing steadily and spreading to specialized fields of study. The Platonic tradition has always been strong in the philosophy of law. It is critical and formal in method and aims at clear definitions and sharp distinctions which empirical social science generally lacks. It is therefore valuable for the regulation of applied science and for professional training.

The non-academic discussion of ethical problems has proceeded as usual with more heat than light. Governments and newspapers are turning more and more to the scientific survey and collection of facts. These surveys originate in practical problems or in moral indignation. They are delegated to experts who put them through the statistical process and they finally issue in some programme of reform, or educational propaganda. The ethical principles involved are gross popular conceptions based on widespread sentiments, and the terms of their expressions are "stereotypes." The subject matter ranges from sex and marriage to the abolition of war, and



the solutions from psychological prescriptions for self-improvement to world movements in education and social regeneration. The best analysis and discussion of this sort of ethics is to be found in the writings of Graham Wallas, Walter Lippman, and Everett Dean Martin.

The movements that have resulted from these programmes and propaganda dramatize and finally reformulate persistent ethical themes. Parents worry about the "younger generation" and eventually find consolation in the establishment and support of mystical religious societies. The younger generation organizes an international youth movement to work out an ethics of emancipation for the next generation. Gordieff, an Anglo-Russian, has founded an institution at Fontainebleau, France, with a programme for the full training of the individual in physical, emotional, and intellectual culture. This institute has wide influence through centres in New York, London, and other cosmopolitan cities. Charity organizations have concentrated their work on a programme for community mental hygiene. Schools have become experiment stations for colleges of pedagogy where psychology and psychiatry hold the centre of the curriculum. Community welfare work is now called adult education.

Out of the experience and discussion that these movements generate, there often come very important theoretical works. The best example in recent years is the writing of R. H. Tawney. His *Religion and the Rise of Capitalism* is written with scholarship, humor, and fine sensibility, and states the historical case for the British Labor Movement. It presents the general thesis which originated in Max Weber's famous essay, *Die Protestantische Ethik und der Geist des Kapitalismus*, that the shift in dominant ethical values from the Middle Ages to the eighteenth century was due to the rise of the mercantile and industrial class, and the reaction of the ecclesiastical aristocratic class to the economic and social problems that followed. The virtues of charity and poverty became vices, and prosperity and thrift became dominant virtues. Other moral values undergo a corresponding evaluation. This book does more adequate justice to both empirical and formal ethical doctrine than any other recent book. Together with its forerunner, *The Acquisitive Society*, it has laid the foundation for both theoretical and practical ethics for modern demands.

There has been growing a doubt whether ethics is a science at all. This is the most significant comment that can be made upon recent ethical theory. It seems that the best ethical discussions are to be found in the modern novel and the literary criticism that follows it. This may mean that the artist and the critic have taken over the functions which religious institutions have increasingly failed to fulfill. If this is true, we may expect very little from the professional student of ethics for a long time to come. Scientific ethics supplies only crude material and confusion, and the artist is never concerned with the morals of his stories.

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**ETHNOGRAPHY.** The literature descriptive of primitive cultures has attained enormous proportions. Although explorations and description were curtailed during the World War, the subsequent period has witnessed unparalleled activity. The present ranking of the primitive areas in the order of completeness of ethnographic surveying is roughly North America, Africa, southeastern Asia, Siberia, Polynesia, Melanesia, South America, Australia, and Micronesia. In recent years, work has gone forward in all these fields but was especially noteworthy in Polynesia and South America, both regions heretofore barely known. Only a single general summary has been published, Buschan's *Illustrierte Völkerkunde* (1922) in a new and augmented edition, although summaries for continental areas were also made available.

**North America.** C. Wissler's *The American Indian* (2d ed., 1922) furnished a comprehensive view of both Americas although it is far more adequate for the northern continent. Complementary to this, although less a survey than an analysis of problems, is *Anthropology in North America* (1915), by F. Boas and others. These inject some order into the maze of discrete data presented by the *Handbook of American Indians North of Mexico* (1907).

Of the nine areas of characterization (culture areas) north of Mexico, only the Arctic and the Northwest Coast were reasonably well-known in the first decade of the century. By 1915 the Plains could be added to this category, California and the Southwest have been added since, and work has progressed in every other quarter. The Great Basin and the interior of Canada and Alaska still remain largely *terra incognita*.

To the earlier work of Dorsey and Mooney in the Plains, the American Museum of Natural History added a notable series of systematic studies of material culture (Wissler), social organization (Lowie), and ceremonial (Lowie and Spier). Wissler's analysis of Plains costumes and riding gear (*Anthro. Papers, Amer.*

*Mus. Nat. Hist.*, 1915-16) demonstrates the development of specific forms of culture traits under known historic conditions. Lowie's *Plains Indian Age-Societies* (*idem*, 1916) is the most comprehensive analysis of a socio-ceremonial system anywhere in the primitive world. The widespread military societies of the Plains Indians are shown to have become integrated into a series of age grades among some of the centrally located tribes. Since the process is demonstrably due to specific historic circumstances, Lowie objects to Schurtz's and Webster's evolutionary theories of age grade formation. Similarly, the *Sun Dance of the Plains Indians* (*idem*, 1921) was shown by Spier to have grown by the accretion of widely diffused elements. Lowie's monographic study of the Crow Indians (Montana) must also be cited as one of the most complete on any primitive people (*idem*, 1912-24). Grinnell's *Cheyenne Indians* (1923) and Fletcher and La Flesche's studies of the Omaha and Osage tribes furnish new ethnographic accounts. Wilson's *Agriculture of the Hidatsa Indians* (1917) is one of the most detailed economic studies of a primitive people. The southern Plains tribes still remain relatively unknown.

A series of similar descriptive works cover the Indians of the Great Lakes: Radin's *Winnebago Tribe* (1923), Skinner's study of the Menomini, Potawatomi, Iowa, and Sauk (*Bull. Public Mus. Milwaukee*, 1926), and Michelson's "Fox" (*Bur. Amer. Ethnol.*, 1926-28). Radin's *Autobiography of a Winnebago Indian* (1920) is a unique piece of primitive self-analysis. Speck demonstrated "The Family Hunting Band as the Basis of Algonkian Social Organization" (*Amer. Anth.*, 1915, 289). The area of southeastern United States has long been the despair of ethnologists because of the almost complete destruction of native cultures in colonial days. J. R. Swanton has achieved a magnificent success by adding to his special studies with *The Indians of the Lower Mississippi* (1911), the *Early History of the Creek Indians* (1922), and a comprehensive analysis, *Aboriginal Culture in the Southeast* (1928). He suggests that the tribes at the heart of the area (Creek et al.) have disrupted an earlier homogeneous culture area. Gower's study of Antillean culture (*Mem. Amer. Anth. Assn.*, 1927) shows that most of the island culture has been derived from South America.

An exceptional opportunity to study an uncontaminated Arctic group resulted in Jenness's *Life of the Copper Eskimo* (1922). Thalbitzer's further publications on the Ammassalik of Greenland now makes this the most fully described Eskimo group. An *Anthropo-geographical Study of the Origin of Eskimo Culture*, by Steensby (1917) bears out Boas's earlier theory that the Eskimo specialized their culture for sea hunting, moving out on the sea-ice, west of Hudson Bay. The hypothesis is confirmed by Rasmussen's discovery of caribou-hunting Eskimo in that district and especially by Mathiasen's finds of archaic Eskimo remains in the central archipelago and southward. Similar archaic cultures have been discovered from Alaska to Baffin Land.

Earlier work in the northwest coast has been supplemented by Boas's further study of the Kwakiutl, now perhaps the most voluminously described primitive people. The work of the Canadian government on the west coast tribes, interrupted by the War, has unfortunately not

been published. Sapir has sketched some results, however, in *The Social Organization of the West Coast Tribes* (1915). Gunther's *Klallam Ethnography* (1927) is the first full study of a Washington tribe. *Archaeological Investigations in the Aleutian Islands*, by Jochelson (1926) fail to reveal any trace of ancient migrations to America by that route.

The Californian area is far from completely surveyed, yet Kroeber's *Handbook of the Indians of California* (1925) will long remain a model for areal studies. It appears that this area is not culturally homogeneous, as was formerly believed, but comprised four subcentres; that in the Northwest affiliates with the northwest coast, the otherwise distinct southern coast and Colorado River with the Southwest, while the central valley contains culture of the Great Basin type. Kroeber maintains that the central-valley culture represents the ancient undifferentiated form which once prevailed over the entire area, the local types to the north and south being subsequent elaborations (*The History of Native Culture in California*, 1923). Detailed studies of California tribes by Kroeber, Gifford, and others appear in the *Univ. Calif. Publ. Amer. Arch. Ethn.* Schenck, in a model archaeological report on the Emeryville shell-mound, casts doubt on the great antiquity formerly ascribed to the Californian culture (*idem*, 23, 1926). The adjoining Great Basin area is barely known beyond Lowie's *Notes on Shoshonean Ethnography* (1924).

The Southwest was investigated as early as 1885, but it is only within the last two decades that appreciable progress has been made toward consolidating the finds in this richest of North American areas. Ethnographic work among the Pueblos by E. C. Parsons (*XXI Int. Cong. Americanists*, 1926) establishes the common background of their intricate ritualism; Kroeber demonstrating the like for social organization in an analysis of *Zuni Kin and Clan* (1917). Strong sees relations to their social system among tribes as distant as south central California (*Amer. Anth.*, 1927). Apache linguistics by Goddard are available, Reichard's *Social Life of the Navajo* (1928); and a comparative study of *Havasupai Ethnography* (1928), by Spier. The prehistory of the region is now better known than that of any similar primitive area, thanks to the brilliant method proposed by Nelson in 1916. The development of historic Pueblo culture can be traced from a semi-nomadic base, which while it received germs of its agriculture, stone house building, pottery, weaving, and ritualism from Mexico, nevertheless developed in comparative isolation (A. V. Kidder. *Introduction to Southwestern Archaeology* 1924; see also a revision in *Science*, 1927, 489). The earliest culture (Basket Making) is placed tentatively at 1500 or 2000 B.C., the final shrinkage of the Pueblo area at about 1100 A.D. Kroeber emphasizes the importance of a non-Pueblo culture centre in northern Sonora and southern Arizona (*Univ. Calif. Publ. Amer. Arch. Ethn.*, 23, no. 9).

The several centres of higher civilization in middle America are viewed by Kroeber as special developments from a common basis. These centres reduce on analysis to two, Peru and Mexico-Guatemala. The earliest Peruvian cultures resemble that of the Maya, but the subsequent history of the two areas shows little interconnection. The growth of these civiliza-

tions from an Archaic horizon has been outlined by Gamio, Kroeber, and Spinden (*Ancient Civilizations of Mexico and Central America*, 1917). Gamio's "Sequence of Cultures in Mexico" (*Amer. Anthro.*, 1924, 307) is (1) the Archaic, (2) Teotihuacan or Toltec, a fusion of the first with a Northern culture, (3) Maya, derived from this, and (4) Aztec, widespread and deriving its intellectual rather than material culture from the Teotihuacan. Kroeber has further analyzed the subject in *Archaic Culture Horizons in the Valley of Mexico* (1925). While Spinden thinks the Archaic horizon (which is, incidentally, roughly equivalent to Pueblo culture and not at all primitive) extends even into South America, Lothrop has been unable to identify it in Costa Rica and Nicaragua. *An Introduction to the Study of the Maya Hieroglyphs* (1915), by Morley, presents the mathematical notation of the Maya in an elementary way, while Spinden's *The Reduction of Mayan Dates* (1924) surveys what has been learned from these ancient remains of Yucatan.

Since 1914 there has been witnessed an attempt to reduce drastically the approximately eighty linguistic stocks north of the Isthmus. This has more than philological interest since historical connections are implied by such groupings. Kroeber and Dixon led the way in 1914 by reducing the twenty-one California stocks recognized by Powell to five: Penutian, Hokan, Shoshonean, Algonkian, with only Yuki as an isolated tongue (*Linguistic Families of California*, 1919). Kroeber also classes Serian and Tequistlatecan as Hokan (*Univ. Calif. Publ. Amer. Arch. Ethn.*, 11, no. 4). This radical result was obtained by accepting Sapir's identification of Yurok and Wiyot as Algonkian and of Yana as Hokan (*Amer. Anth.*, 1913, 617; *Univ. Calif. Publ. Amer. Arch. Ethn.*, 13, no. 1). He revived Brinton's theory of a Uto-Aztecan stock uniting Shoshonean and Nahuatl, and combined Athapaskan, Tlingit, and Haida into one Nadene family (*Jour. Soc. Américanistes de Paris*, 1913, 379; *Amer. Anth.*, 1915, 534). Sapir's tendency was toward a marked break with the traditional classification, but he did not go to the extreme of P. Radin's *Genetic Relationship of North American Indian Languages* (1919), which reduced all to one grand stock.

Protests against particular combinations were voiced by Michelson, Goddard, and Uhlenbeck. The last maintains that Reichard's *Wiyot Grammar*, which appeared (1925) since Sapir wrote, shows no certain Algonkian affinities (*Intern. Archiv. für Ethn.*, 28, 153; *Mededeelingen der Koninkl. Akad. van Wetenschappen*, 1927, 233). Boas's strictures were of more fundamental nature. He questioned the legitimacy of synthesizing these languages, since it can be shown that phonetic and grammatical elements are distributed over continuous areas among languages of widely divergent stocks (*Amer. Anth.*, 1920, 367; *XXI Int. Cong. Americanists*, 1926, 305).

The useful "Bibliography of American Folklore, 1915-1928" (*Jour. Amer. Folklore*, 1928, 1) by A. Lesser, covers the period of this survey.

**South America.** The most noteworthy advances in the South American field have been in unraveling the archeology of Peru and in a series of comparative studies coördinating the ethnology of the continent. Ethnographic studies of consequence have appeared for Tierra del Fuego, the Amazon-Guiana district, and the

Chaco (Argentina-Bolivia). Much of the work in the South American field is that of European scholars whose reports are commonly to be found in the *Journal de la Société des Américanistes de Paris*, edited by P. Rivet. No satisfactory summary is available, in default of which there is C. Wissler's *American Indian* (2d ed., 1922), R. Karsten's *Civilizations of South America* (1927), and T. W. Danzel's *Handbuch der Präkolumbischen Kulturen in Latein Amerika* (1927).

Investigations of Koppers and Gusinde among the Yagan of Tierra del Fuego (*Unter Feuerland-Indianern*, 1924) revealed that the ceremonial life of these people was not so rude as their material existence suggested. Initiatory rites, secret societies, and masks were discovered. Earlier scanty data on their material culture was supplemented in S. K. Lothrop's *Indians of Tierra del Fuego* (1928). This author, in line with prevailing opinion, looks on the Fuegian culture as similar to that of the earliest ancestral Indians. An important survey, "Culture Diffusion and Culture Areas in Southern South America," by J. M. Cooper (in *XXI Int. Cong. Amer.*, 1926, 406) represents the archaic culture of the region as like that of the present Fuegians, somewhat differentiated east and west of the Cordillera. This was subsequently overlaid by a southerly drift of traits as far as the Araucanians on the west and the Tehuelche on the east. Local differentiation occurred in the extreme south; later influences brought the plank boat down the west coast and the horse through Patagonia.

The Amazon-Orinoco Basin has produced several detailed studies, all too rare from South America. *Animism and Folklore of the Guiana Indians* (1915) and *The Arts, Crafts, and Customs of the Guiana Indians* (1924), by W. E. Roth, cover the tribes between the Orinoco, Rio Negro, and lower Amazon in a thorough manner. Supplemental for this area is W. C. Farabee's *Central Arawaks* (1918) and *Central Caribs* (1924), and T. Koch-Grünberg's *Von Rorotima zum Orinoco* (1917-1923). The Indians of Colombia are described by K. T. Preuss (*Forschungsreise zu den Kigaba*, 1926); of Ecuador, by S. A. Barrett (*The Cayapa Indians*, 1925), and of the Amazon Country, by T. Whiffen, (*North West Amazons*, 1915).

The nearest approach to a general survey for South America is E. Nordenskiöld's series, *Comparative Ethnographical Studies* (1919-1928), which are so replete with information as to make a summary difficult. A convenient introduction to the ethnographic literature is to be found in vol. ii. While Nordenskiöld's field work has been largely on the borders of Bolivia, Brazil, and Argentina (*Forschungen und Abenteuer in Südamerika*, 1924), his perspective is always continent-wide; witness, *The Ethnography of South-America as Seen from Mojos in Bolivia* (1924). Nordenskiöld maintains reserve toward Rivet's and Schmidt's thesis of an Oceanic origin of South American culture.

The proponents of the Oceanic theory maintain that much of the Amazonian and southern South American culture is of Melanesian and Polynesian origin. To the earlier dicta of Graebner and Schmidt that their Oceanic culture-strata can be identified in South America (see ETHNOLOGY), has come the adhesion of Rivet, Verneau, and others. P. Rivet claims the Tehon language of Patagonia to be closely al-

lied to those of Australia and Hokan (of western North America) with Melanesian-Polynesian tongues (*Bull. Soc. Ling. de Paris*, 26, 23; *Jour. Soc. Amér. de Paris*, 18, 141). The evidence is far from convincing to American linguists. Similarly, it is doubted that there is justification for asserting the affiliation of the "Lagoa Santa race" with Oceanic types (*Anthro. Papers, Amer. Mus. Nat. Hist.*, 23, Pt. 7). Contrary to the assertion of E. von Hornbostel that the scales of Pan's pipes in the Solomon Islands were identical with those of Peru and Brazil, C. W. Mead has shown that there is no correspondence save in an accidental case (*Musical Instruments of the Incas*, 1924). Rivet has developed an elaborate system of migrations to sustain his theories (*XXI Cong. Int. Américanistes*, 1926, 1).

The delineation of culture succession in Peru is more substantial than these inferential and even speculative attempts at culture history. Uhle and Kroeber are agreed that the earliest known culture (Pre-Tiahuanaco) is that of Nazca on the coast and Chavin in the northern highlands. This is a full-fledged, highly elaborate culture, and in no sense primitive. Tello holds, however, that this was preceded by an archaic culture, known typologically but not placed by stratigraphy. The fishing culture found by Uhle at Ancon and Supe looks primitive but may not be early. Tello stresses the influences of the interior on the coast in the earlier periods. Following Pre-Tiahuanaco, Kroeber and Uhle place Tiahuanaco, Pre-Inca, and Inca as successive cultures. Pre-Inca is a period of local coast developments; Inca, a highland culture intrusive on the coast, terminated at the Spanish advent. There is no reason for assuming that Nazca is more ancient than 1500 years. Uhle claims traceable similarities to Peruvian culture as far north as the Maya area and even to the Toltecs and Mississippi Valley, but this must be met with reserve. (Kroeber, *Univ. Calif. Publ. Amer. Arch. Ethn.* 21; *Amer. Anth.*, 1927, 626; Uhle, *Anales Univ. Central del Ecuador*, 36; Tello, *Introducción a la Historia Antigua del Perú*, 1922).

Asia. Except in so far as Russian sources hitherto inaccessible may be concerned, the Siberian literature remained somewhat weak in monographic contributions. There is nothing to compare with the classic works of Bogoras and Jochelson on the Chukchi and Koryak published early in the century. To these studies on the Palaesiatic tribes of northeastern Siberia, Jochelson added a series on the Yukaghir and the Yukaghirized-Tungus. This investigator believes that the resemblances of Palaesiatics to North American Indians indicates a counter migration to Asia. Laufer's discussion of *The Reindeer and its Domestication* (1917) shows the interrelations of the Siberian tribes. The reindeer was probably domesticated by the Southern Samoyed of Lake Baikal circa 300 A.D. From this centre, its use spread westward to the Lapps, perhaps not earlier than the tenth century, and eastward among the Palaesiatic tribes (see also Hatt, *Notes on Reindeer Nomadism*, 1919). A useful handbook of the social and religious customs of *Aboriginal Siberia* was issued by M. A. Czaplicka (1914), who followed it with a special account of *The Turks of Central Asia* (1918). The south Siberians of the Bronze and early Iron ages were identified by her with the Turks, in agreement with Laufer.

The home of the Turks seems to have lain in southern Mongolia, while the region now called Turkistan was peopled by Iranians.

The original continuity of Chinese culture with Near Eastern cultures in antiquity is insisted on by B. Laufer (*Some Fundamental Ideas of Chinese Culture*, 1914). Laufer has gone far to document his contention in a series of special studies, such as a demonstration that Chinese porcelain (*The Beginnings of Porcelain in China*, 1917) developed indirectly out of a glazing technique derived from the West. His *Sino-Iranica* (1919) traces the myriad cultural connections between these regions. He establishes beyond a doubt that many borrowings were made by and from the supposedly isolated Chinese. Shirokogoroff, in his *Chinification of The Social Organization of the Manchus* (1924), has shown the change as progressive. China was long thought to have had no stone age, its culture history beginning with the Bronze epoch. Nelson and Andersson, however, have discovered several Neolithic horizons (*Geol. Survey of China Bull.*, 5; *Amer. Anth.*, 1927, 177). On the aborigines to the east is Torii's "Les Ainou des Iles Kouriles" (*Jour. Coll. Sci., Imp. Univ. Tokyo*, 1918).

Relatively little new material has appeared on the aborigines of India. The isolated Andamanese have received the attention of A. R. Brown (*Andaman Islanders* 1922). Like other Negrito peoples, the culture of the Andamanese is simple, lacking clans and totemism. Pottery and the outrigger canoe may be acquisitions since the Andamanese reached the islands, but antedate the linguistic differentiation Brown found there. Their isolation is obvious in all phases of their culture. A series of descriptions are newly available for Assam and Burma: Gurdon's *The Khasis* (1914), Hutton's *Angami Nagas* (1921) and *Sema Nagas* (1923), Smith's *Ao Nagas* (1925), and Marshall's *Karen People of Burma* (1922). Milne's *Home of an Eastern Clan* (1924) refers to the Palaung of the northern Shan states. The Negritos of Malacca were the subject of a sketch by Schabesta (*Bei den Urwaldwergen von Malaya*, 1927).

Information on the East Indies is somewhat scattering. Evan's *Among Primitive Peoples of Borneo* (1922) provides data on the northern sector. Kaudern has begun an analysis of culture elements in Celebes. Collet's *Terres et Peuple de Sumatra* (1925) is a survey and Schröder's *Nias* (1917) detail, on an island group. Improved information on another island group is Loeb's *Mentawai Social Organization* (*Amer. Anth.*, 1928, 408) and Kruyt's *De Mentawaiers* (1923).

It is unfortunate that for the East Indies there is no summary corresponding to Kroeber's *Peoples of the Philippines* (1919) which provides a culture history for that archipelago. Cultural differences and physical types alike suggest the presence of three primary strata. The earliest inhabitants were Negritos, who may have extended over the East Indies as well, but whose original culture is unknown. The primitive Indonesian culture which followed has also not remained intact, but is represented in the mountains of Luzon. The culture of the Malaysians who followed in turn may at first have been similar or may have entered the islands already heavily charged with the Hindu elements it contains. At any rate, there was then an overlay

successively of Hindu, Mohammedan, and Spanish influences. Of special studies, Barton's *Ifugao Law* (1919), backed by his *Ifugao Economics* (1922), gives a surprising picture of an elaborate legal code among a people where no political machinery exists. This is referable to the Indonesian stratum. So are other studies, such as Benedict's *Bagobo Ceremonial, Magic, and Myth* (1917), Cole's *Traditions of the Tinguian* (1915), and Garvan's *Material and Sociological Culture of the Manobo* (1927).

Something of a survey for the whole continent is found in Buxton's *Peoples of Asia* (1925).

**Oceania and Australia.** Although the Oceanic languages (except Australian) form a group with those of the East Indies, the Malayo-Polynesian, several distinct culture provinces are recognized: Polynesia-Micronesia, Melanesia-New Guinea, Australia-Tasmania.

More fresh material has been added to Polynesia than to any similar expanse in the world, largely by the instrumentality of the Bishop Museum in Hawaii. While the ostensible interest is in unraveling the migrations in the Oceanic area, its excellent monographic material is free from theoretical prejudice. For areas with typical Polynesian culture, there are the Tongan data of Gifford and Marquesan of Linton and Handy to add to the early missionary accounts. Skinner portrays the Moriori of Chatham Is. as a marginal group. The first volume of K. von den Steinen's *Die Marquesaner und ihre Kunst* (1925) describes tattooing. Williamson's survey, *The Social and Political Systems of Central Polynesia* (1925), describes the variations from a Samoan norm. The dual organization of this region is ascribed to the influx of a conquering people, following River's theory. Material on Micronesia offers little beyond Erdland's *Die Marshall-Insulaner* (1914).

A host of studies of Melanesia have appeared, chiefly from English authors. Chief among these are a group on the Trobriands, by Malinowski (*Argonauts of the Western Pacific*, 1922; *Crime and Custom in Savage Society*, 1927; *Sex and Repression in Savage Society*, 1927), among whom were found the peculiar physiological theories concerning birth held also by the Australians. Thurlwald's *Banaro Society* (1917) gives a detailed account of the intricate social system of a Papuan people. Among synthetic studies is Rivers's *History of Melanesian Society* (1914), whose thesis of the coalescence of migrating groups forming a dual structure is reflected in Humphrey's *The Southern New Hebrides* (1926).

A new survey was put under way in Australia and has produced both synthetic and descriptive studies. In 1919 Schmidt provided a classification of Australian languages (*Die Gliederung der Australischen Sprachen*) which, however, was impaired by his injection of the culture-strata hypothesis. Kroeber's survey, "Relationship of the Australian Language" (*Jour. Proc. Roy. Soc. New South Wales*, 1923) agrees as to their unity in a single stock but presents a somewhat different picture of their grouping. Spencer's *The Arunta* (1927) is an expansion of his work on the typical central natives, while his *Native Tribes of the Northern Territory of Australia* describes an atypical group lacking the rich ritualism of the former. The study of West Australia received an accession in Brown's "Notes on the Social Organization of the Australian Tribes" (*Jour. Roy. Anth. Inst.*, vol. 48, 1922).

**Africa.** The culture area concept which has served North American ethnographers so well has been applied to Africa by Herskovits. In his "Culture Areas in Africa" (*Amer. Anth.*, 1924, 50) he defines south of the Mediterranean littoral; the Hottentot and Bushman areas, Congo, East African cattle area, East African Horn, the Desert area, western and eastern Sudan, and Egypt, each with a characteristic culture. Madagascar also has been divided into sub-culture areas by Linton (*Amer. Anth.*, 1928, 363); East coast (fishing and local subs.), plateau (rice terracing; feudal system), and the west coast and south (cattle; absolute monarchy).

Meinhof's and Westerman's linguistic investigations have been followed by Johnston's *Comparative Study of the Bantu and Semi-Bantu Languages* (1922), surveying not less than 274 distinct languages. A new series of distribution studies in material culture has been begun by Lindblom (Stockholm, 1926-28). A comprehensive view of African religion, especially that of the Bushmen and the agricultural Bantu, is C. Meinhof's *Die Religionen der Afrikaner* (1926). An excellent preliminary outline is "African Negro Music," by E. von Hornbostel (*Africa*, 1928, 30).

Most of the new descriptive material from this continent is from British domain in West Africa, pertaining in part to Congo culture, in part of the Sudan. Rattray's accounts, *Ashanti* (1923) and *Religion and Art in Ashanti* (1927) are exceeded in detail only by Talbot's *Peoples of Southern Nigeria*, each a mine of information. F. von Luschan's monumental work, *Die Altertümer von Benin* (1920), argues the independent character of Benin art, despite suggested connections between southern Europe and the western Sudan. An approximation to an absolute chronology for the antiquities of Benin was suggested by Struck (*Zeit. für Ethnol.*, 1923), who sets an Archaic period from the twelfth to fourteenth centuries A.D., an Early period to 1500, and the Great period to 1691. Thomas's *Anthropological Report on the Ibo-Speaking Peoples* supplements our knowledge of the western Sudan. On the basis of cephalic index and magical customs on the White Nile, Seligman holds (*Jour. Roy. Anth. Inst.*, 55, 15) that there has been an eastward movement of the southern Sudanese.

The earliest inhabitants of the northeast Congo were Pygmies according to Czekanowski (*Forschungen im Nil-Kongo Zwischen-Gebiet*, 1917-24), who were followed by Bantu from the Congo, who in turn were replaced by Madis, Azandes, and others. Joint influences of Bantu and Sudanese features are seen in the life of Uganda (*The Lango*, by Driberg). R. P. van Wing's *Étude Bakongo* (1921) and Torday's *On the Trial of the Bushongo* (1925) are of the Congo proper.

Eastern and southern Africa is surveyed by Herskovits (*Amer. Anth.*, 1926, 230). The culture of this area centres in large part in a cattle complex; the cattle figure as wealth, dowry, sacrifices, etc. These features are found everywhere in the area but enter into varying relations with other elements. Uganda tribes were recently reported in *The Bagesu* (1924), *The Bakitara*, *The Banyankole* (1927); and also *Northern Bantu* (1915), by Roscoe. *The Ila-Speaking Peoples of Northern Rhodesia*, by Smith and Dale (1920) describes a typical cattle peo-



study of limited areas, with a minimum of pure speculation. Much less emphasis has been placed on tracing connections between remote areas, although these were not barred on principle. Of late, there has been some tendency to connect distant elements in the two Americas by Wissler (*The Relation of Nature to Man*, 1926) and to give a preponderance of credit to the centres of higher civilization of Middle America for the more cultivated arts of the peripheral regions by Kroeber (*Anthropology*, 1923).

More important is the fact that historical reconstruction is not considered the all-in-all of ethnological study, but the starting point for inquiries into the nature of cultural growth. Wissler's studies of Plains Indian costumes show, e.g., the manner in which traits of a material nature are welded to form new cultural entities; Spier's study of the sun dance is primarily concerned with the differential nature of diffusion and the sources of ceremonial elaboration. The historical and psychological aspects of the spread and growth of the Peyote cult have been discussed by Radin (37th Ann. Rep., Bur. Amer. Ethnology, 1923). These factors of cultural dynamics have been systematically outlined by Lowie in *Culture and Ethnology* (1917), Boas et al. in *Anthropology in North America* (1915), Wissler in *Man and Culture* (1923), and Dixon in *The Building of Cultures* (1928).

Studies from this point of view look on culture as a set of habits by which the original nature of man is patterned in conformity with the modes of behavior of the society in which he finds himself. The older ethnographies described cultures as though they were patterns of thought and action to which every individual in the particular society conformed absolutely. A change has appeared in more recent ethnographies, due partly to the recognition that conflicting testimony by natives could not always be harmonized, but chiefly to the realization that new customs arose from the variant behavior of individuals. Cultures are now thought of as dynamic, not static; no account of standard practices does justice to the ferment in culture. One such protest against the typological exposition is Malinowski's *Crime and Custom in Savage Society* (1926). Considering the variability of human nature, it hits wide of the mark to speak of an "automatic submission" of the savage to the dictates of his community. The individual has a wide variety of mutual obligations to his fellows: he is subject to conflicting codes and compulsions of varying degree. His personal experience determines how far he conforms or evades. Examples of such conflicts and the atypical behavior which may lead to new cultural norms are found in the native autobiographies now on record. Most noteworthy of these is Radin's *Autobiography of a Winnebago Indian* (1920). The same writer insists further on variability in his discussion of *Primitive Man as Philosopher* (1927), finding the same distribution of mentality and temperament in all societies, primitive and modern. Hence, the thinker, rationalizer, and sceptic make themselves felt in even those societies commonly viewed as containing only dull conformists. Quite a different approach to the interaction of cultural patterns of thought and individual states is Mead's comparison of the adolescent girl in Samoa and in modern America (*Coming of Age in Samoa*, 1928).

It must not be assumed that this approach is confined to American students; Marett, independently of any school, suggested, if he did not himself cultivate, similar lines of research in his *Psychology and Folklore* (1921). Rivers, a psychologist and physiologist by early training, devoted some papers to this subject, but was led in later years to devote himself to historical reconstruction. Two others in England, Radcliff-Brown and Malinowski, have espoused a view, which they describe as "functionalist," not so different from that of the Americans. This has been more clearly enunciated by Brown in his "Methods of Ethnology and Social Anthropology" (*South African Jour. Sci.*, 1923, 124). Their concern is not to seek origins, but by induction to summarize in the form of general laws those interrelations which hold between the various phases of culture. For example, with respect to totemism, Brown holds that primitive societies ritualize things important to their social life (e.g., economically important plants and animals by a hunting people), and that in segmented societies (i.e., with clans, etc.) each segment has corresponding observances of this type. It is doubtful, however, that Brown's formulation for *The Andaman Islanders* (1922), e.g., is anything more than a vaguer statement of what he has described in detail in the same work.

Progress also has been made since 1914 in a number of special fields. The traditional view of the unilinear evolution of social organizations was reiterated by Hartland in his *Matrilineal Kinship and the Question of its Priority* (1917) and his *Primitive Society* (1921). This was countered by Lowie, who showed in *The Matrilineal Complex* (1919) that it is a logical, not a historical entity. Lowie's *Primitive Society* (1920) showed further that there is no necessary priority of either maternal or paternal structures: that each has grown independently of the other from a "loose" family organization as a result of factors stressing one of the other lines of descent. Such factors as unilateral residence, inheritance of property, etc., nascent in many loosely organized societies, may operate to this end without that "grand reformation" conceived by that arch systematist, Morgan. Spier's "Suggested Origin for Gentile Organization" (*American Anthropologist*, 1922, 487) adduces such a case. The important point is that such sibs (clans, gentes) are the result of specific historic causes in each section of the world where they are found and not due to any inherent and unilinear trend. These have been established by Strong, e.g., in "An Analysis of Southwestern Society" (*American Anthropologist*, 1927, 1), while Parsons and Boas have shown for the southwest and northwest coast areas, respectively, that the mixed patrilineal-matrilineal features of intermediate zones were due to mingling of patrilineal and matrilineal social forms segregated at their peripheries (*American Anthropologist*, 1924, 340). Kroeber pointed out that the similarities of Pueblo structure are due to diffusion (*Zuni Kin and Clan*, 1917). An attitude similar to Lowie's was taken by Schmidt, whose culture-strata scheme rests on the assumption that patrilineal and matrilineal societies have had different origins, hence that a discussion of their priority is futile. Rivers, as well, moved from the unilinear view of social development, holding that such a form as a dual organization in Melanesia resulted from migra-

tion and cultural conquest (*History of Melanesian Society*), and going so far as to evoke diffusion for many or most like instances (*Social Organization*, 1924).

Kinship proved a topic of interest in earlier years. Rivers's *Kinship and Social Organization* (1914) vindicated the correlation between social customs, especially marriage forms, and relationship terms. Lowie established the validity of this for North America in *Historical and Sociological Interpretations of Kinship Terminologies* (1916). An important result of this discussion was the systematic collection of kinship systems in this area which resulted in such analyses as Gifford's *Californian Kinship Terminologies* (1922) and Spier's *Distribution of Kinship Systems in North America* (1925). The latter discriminates eight types of systems, each with continuous distribution over a broad area.

An attack on the assumption of the old school that private property did not exist in primitive societies was also made by Lowie (*Primitive Society*), which in one form or another was shown to exist even on the rudest levels. In the same work he showed, contrary to Morgan and Maine, that the germs of political organization also existed in the form of the territorial bond and fraternal associations, but in his *Origin of the State* (1927), he was less inclined to see importance in the latter factor.

Progress is less substantial in the field of religion. As part of his culture-strata scheme, Schmidt held that a belief in a relatively pure monotheism was one of the archaic religious tenets. He projected a series of religious concepts conformable with each stratum (*Der Ursprung der Gottesidee*). Lowie's approach to *Primitive Religion* (1924) was comparable to his pluralistic view of social origins, in that he, too, was unable to find basis for unilinear developments. His special contribution was an insistence on joint historical and psychological analyses. Attention also was centred on individual variability. For example, it was suggested that the nature of visions is partially fixed by the sensory character of the visionary's imagination. This led to a consideration of psychic associations, wherein individual and socially determined connections of ideas bring about the rationalization of theology and the growth of ceremonialism. The growth of ritual in North America was discussed by the same author (in *Anthropology in North America*, 1915), and in a restricted area by Spier (*Sun Dance of the Plains Indians*, 1921). Totemism continued to hold interest in the earlier years of this period, Schmidt arranging an international symposium in his journal *Anthropos*. Goldenweiser receded from his earlier admirable stand that totemism, having no fixed content, must not be regarded as a single socio-religious expression. In "Form and Content in Totemism" (*American Anthropologist*, 1920, 280) and *Early Civilization* (1922), he took the position that it is characterized by "the association of the totemic content with a clan system," which contravenes what he had already proven with respect to the fluctuating content and its lack of connection with exogamic groups.

Perhaps nowhere does Boas's concern with the conditions under which cultural traits take form find better expression than in his treatment of his subject in *Primitive Art* (1927). Since all art contains both formal and significant elements, we cannot assume that the expression of emo-

tional states, a mere desire to create the beautiful, is the beginning of art. The problem consists in ascertaining whence the formal element is derived and how significance attaches to it. Some part of the formal element, the art style, is derived from technique and its control, which flourishes in virtuosity. Symmetry may be due to sensations of symmetrical manual movements; rhythms in space may be really rhythms of time. Since acquisition of technical control in itself brings pleasure, it may be that we have here the original impulse to aesthetic expression. A desire for graphic representation may take the form of realism, or by abbreviation, fixing only on essentials, that of symbolism. Where these two exist together, a transfer of significant meaning may occur. From this point of view, the unilinear sequences, conceived by Haddon and Holmes, from realism to symbolism and vice versa, appear unfounded. (See, e.g., van Scheltema, *Die Attnordische Kunst*, 1923). Styles develop by the selection of differing principles of symbolic representation and composition in realistic art, and by differing formal elements in geometric art. Boas's thorough study is documented not only by his own work but that of his students, e.g., Haeberlin's "Types of Ceramic Art in the Valley of Mexico," and Reichard's "Complexity of Rhythm in Decorative Art" (*Amer. Anth.*, 1919, 61; 1922, 183).

Primitive literature, the folk tale and myth, have come in for even a greater share of study than art, but less with respect to their aesthetic qualities than their form and history. In America, this also is the result of Boas's stimulation, whose theses are also summarized in his *Primitive Art*. It has been abundantly established by Boas, Lowie, and Waterman that folk-tale material is in a constant state of flux, due primarily to the diffusion and incorporation of incidents, plots, motifs, etc. This is subject to reinterpretation according to the prevailing modes peculiar to each culture. Among recent special studies confirming this may be cited: Reichard's "Literary Types and Dissemination of Myths" (*Journal of American Folklore*, 1921, 289), Boas's *Kutenai Tales* (1918) and Gunther's *Klallam Folktales* (1925). Boas has gone further in his *Tsimshian Mythology* (1916) inquiring how the culture, thought, and passion of a people find expression in their tales. The "Stylistic Aspect of Primitive Literature" (*Journal of American Folklore*, 35, 329) has also been scrutinized by Boas. Repetition, frequently rhythmic, is universal in tales, hence must be laid to the common psychic habits of man. On the other hand, the similarity of literary traits which are common to large areas but not universal, must rest on historical factors; such are proverbs, riddles, epic poetry, and moralizing tales, which are common in the Old World but unknown in the New. Similarly, motives of tales are not alike in all areas, nor the tendency to combine distinct tales, but are historically determined by the diverse cultural interests in each area. A different approach to this problem is Radin's *Literary Aspects of North American Mythology* (1915). The rôle of myths in the life of a people was sympathetically described by Malinowski (*Myth in Primitive Psychology*, 1926) and by Smith and Dale (*The Ilu-speaking Peoples of Northern Rhodesia*, 1920).

Several world-wide surveys of language have been attempted, of which Meillet and Cohen's

*Les Langues du Monde* (1924) was undoubtedly the most satisfactory. Broader groupings were proposed than heretofore; for example, Delafosse insisted on a fundamental resemblance of the welter of Sudanese languages with Bantu, the most widespread stock of Africa. On the other hand, Schmidt's *Die Sprachfamilien und Sprachkreise der Erde* (1926) was an attempt to make the groupings of stocks, and even grammatical categories, conform to his culture-strata, a conclusion which linguists in general are not prepared to accept. Sapir also has fathered a movement for a drastic reduction of the number of American Indian Stocks recognized, to which Boas offers a salutary warning ("Die Klassifikation der indischen Sprachen" in *XII Int. Cong. Americanists*, the Hague, 305). Boas shows that a number of phonetic and grammatical elements are distributed over continuous areas among languages of widely divergent stocks. This means that these elements tend to spread, rather than that two stocks with the same element were differentiated from a common prototype. In fact, the number of early stocks must have been much greater than at present, rather than that modern stocks are developed from a few languages.

A wholly new approach in *Language* (1921) has been broached by Sapir, which bids fair to revolutionize general linguistic studies. He stresses not only the unconscious character of linguistic usage, but insists that however unconscious this may be, it conforms to patterns, both grammatical and phonetic. "This means that there is something like an ideal linguistic entity dominating the speech habits of each group, that the sense of almost unlimited freedom which each individual feels in the use of his language is held in leash by a tacitly directing norm." The clustering of sounds in phonetic patterns is significant, not so much because of their motor or acoustic resemblance, as that the relational gaps in such a series are necessary to the psychological definition of the sounds (*Sound Patterns in Languages*, 1925). Speech-sounds of a dialect tend to run in a certain habitual groove, so that whatever change these sounds undergo, they nevertheless conform to the general system of sounds. But the system itself is subject to "drift," the reasons for which are obscure but lie in the "genius" of the language. At any rate, their movement is not random but in a definite direction. This would explain parallel developments occurring in related languages long after their separation.

The inroads of psychoanalysis into other fields are discernable in anthropology, although the permanent effect does not seem appreciable. Freud finds "that the beginnings of religion, ethics, society, and art meet in the Oedipus complex." His *Totem and Tabu* (1919) explains these by acts within the primeval horde; the sons having been prevented by their sire from sexual indulgence, slew him, but an ambivalent tenderness, replacing their hate, took the form of remorse. "They undid their deed by declaring that the killing of the father substitute, the totem, was not allowed, and renounced the fruit of their deed by denying themselves the liberated women." Thus totemism and exogamy are accounted for.

While the importance for culture of that part of the psychoanalytic doctrines which stresses the influence of experiences of the early life of the individual on his later acts cannot

be denied, this particular historical reconstruction cannot stand (see Kroeber, *Amer. Anth.*, 1920, 48). Malinowski, among others, has successfully challenged this formulation, showing among other things, that the Oedipus complex is not universal (*Sex and Repression in Savage Society*, 1927). Thus, in the Trobriands, matrilineal organization of society produces a stress and neuroses of quite different character from those of patriarchal or paternally dominated societies. Seligman, accepting Jung's classification of psychic types, classes various peoples as introvert or extravert ("Anthropology and Psychology," in *Jour. Roy. Anth. Int.*, 54, 13). Thus, the Nilotic Dinka for their aloofness, gravity, religiosity, and lack of interest in the white man are classed as introvert; the Palaeasiatics of Siberia, noted for dissociation and with typical savage instability of opinion, are extravert. This is an interesting classificatory device, but must not be construed as a historical explanation. See ANTHROPOLOGY; ETHNOGRAPHY.

ETTINGER, MAX (1874- ). A German composer, born in Lemberg. Because of protracted illness, he did not begin the serious study of music until 1899, in Berlin, and in the following year removed to Munich, where he attended the Conservatory. He wrote a string quartet; a quintet for woodwind and piano; a violin sonata; a cello sonata; *Suite and Träume* for orchestra; *Weisheit des Orients* for soli, chorus, and orchestra; many songs; and the operas, *Judith* (Nuremberg, 1921), two one-act operas, *Der eifersüchtige Trinker* and *Juana* (Nuremberg, 1925), *Clavigo* (Leipzig, 1926), and *Frühlings Erwachen* (Leipzig, 1928).

ETTLINGER, ETLING-ER, KARL (1882- ). One of the foremost humorists of Germany, born in Frankfurt, who became editor of the magazine founded by the late Georg Hirth, *Jugend*. Among his numerous works were *Der neue Martial* (1905); *Ovids Liebeskunst* (1905); *Das Tagebuch eines glücklich Verheirateten* (1906); *Unsere Donna* (1907); *Der neue Juvenal* (1907); *In Freiheit dressiert* (1908); *Streifzüge eines Kreuzvergnügten* (1910); *Die Hydra*, a comedy (1911); *Scherzo*, a one-act play (1913); *Mister Galgenstrick* (1915); *Aus frohem Herzen* (1915); *Benno Stehkragen* (1917); a volume of war verse, *Lieder eines Landsturmmannes* (1919); *Das Verhältniss* (1920); *Die duldsame Eva* (1921).

EUCKEN, oik'ën, RUDOLPH CHRISTOPH (1846-1926). A German philosopher (see Vol. VIII). After 1914 he published *Geistige Forderungen der Gegenwart* (1918); *Der Sozialismus und seine Lebensgestaltung* (1920); his autobiography, *Lebenserinnerungen, ein Stück deutschen Lebens* (1920), and *Ethikals Grundlage des Staatsbürgerl. Lebens* (1924). The first three works were translated into English.

EUGENE, t-jën, ARCHDUKE (1863- ). An Austrian soldier, born in Moravia. In his earlier years he served in the army, but retired on account of ill health. At the outbreak of the World War he again entered the service, and after the Austrian retreat in Serbia in 1914, was given command of a portion of the Austrian troops. After the entrance of Italy in the War, he commanded the southwestern front, and achieved great success at Isonzo and elsewhere. He retired from active service in January, 1918, and moved to Switzerland.

EUGENICS. The term eugenics has come into common usage and as usually understood

means applied human genetics. Genetics (see HEREDITY and ZOOLOGY) is primarily concerned with heredity as a biological phenomenon and is a true experimental science, but, since for obvious social reasons experiments in human breeding are impossible, geneticists give the problems of human heredity little attention. Several organizations and a few institutions have devoted themselves to the consideration of the results obtained by the study of heredity in general, in the effort to apply them to man, or at least to point the way to the betterment of human stock.

The aims of eugenists and their analyses of the present trend vary widely. In general, they assume that heredity is more potent in human behavior than social factors; that certain races and individual types are more desirable than others; and that eugenical breeding will eliminate the "unsuccessful," the poor, diseased, and criminal. Their programmes take several forms. By some, certain races are held superior; others should be eliminated or refused entry to the country, and miscegenation should be prevented. Another programme would eliminate strains having hereditary defects by sterilization or prohibiting their marriage. A third method looks to selective mating, in which superior strains would be encouraged to propagate more freely. In a succinct article, "Eugenics" (*Scientific Monthly*, November, 1916), F. Boas points out that eugenists do not discuss impersonally whether certain features are due to heredity or environment. For example, it is not clear whether alcoholic and criminal tendencies in certain families are due to heredity or to continuing social maladjustment. He holds that the same social functions and participation in the same culture are open to varied biological types.

In the United States, health boards and charity commissioners began to advocate legislation for the segregation and sterilization of incompetents and delinquents as early as 1910. Laws were passed in 1913 authorizing the sterilization of the unfit in North Dakota, Michigan, Kansas, Oregon, Wisconsin, California, and Iowa. During the same year, legislation restricting marriages were enacted in England, Spain, New Zealand, and elsewhere. In the United States, fifteen States had passed such laws by 1924, though much of this legislation was inoperative. The greatest stimulus to the general consideration of eugenics was the Wisconsin Marriage Law of 1913, which required medical certification for all who applied for licenses. This brought on a nation-wide discussion and attempts at similar legislation in other States.

An International Eugenics Congress was held in London in 1912. Owing to the World War, this congress was not reconvened until 1921. Several similar gatherings have been held since. While Great Britain and the United States were among the earliest nations establishing eugenical organizations, others have appeared in all leading European and Latin American nations, in Japan, and in China. Sweden was the first nation to set up an institute for race-biology. In 1918 the University of Upsala subsidized the research of H. Lundborg into the lineage of peasant families, and he received small grants from the Government. His researches were so promising that in 1921 the Riksdag established the institute without a dissenting vote. The result of his investigations among soldiers were published in 1926 under the title *The Racial Characters of the Swedish Nation*.

One form which the narrow nationalism of the war years took was an exaggerated expression of eugenical doctrines, so perverted and prejudiced as to be distinctly prejudicial to the best interests of the eugenics movement. Gobineau's *The Inequality of Human Races*, which originally appeared in 1853, was republished in 1915 to rationalize war prejudices. Other characteristic works of like tenor were M. Grant's *The Passing of the Great Race* (1916), H. S. Chamberlain's *Le plus récent philosophe du pangermanisme mystique* (1917), and L. Stoddard's *The Rising Tide of Color Against White Supremacy* (1920) and *Racial Realities of Europe* (1924). A judicious analysis and criticism of these extremists will be found in F. H. Hankins, *The Racial Basis of Civilization*, (1928).

The examination of recruits to the United States Army during the War was the first opportunity to take stock of physical well-being and psychological status on a large scale. Marked differences were found among various racial, national, and local groups in their performance of psychological tests. These are discussed by R. M. Yerkes, *Psychological Examining in the U. S. Army*, (1921) and Yoakum and Yerkes, *Army Mental Tests* (1920). This work led to such extravagant expressions as C. C. Brigham's *A Study of American Intelligence* (1923). While the purpose of these tests was to find soldiers with special capacities for particular work, the contrasts noted were interpreted as significant of racial differences. Among typical results were the following (by percentages of each group above, at, or below the middle score):

	Below	Middle	Above
Englishmen	9	71	20
White draft, generally	24	64	12
Italians	63	36	1
Poles	70	30	0.5
Negroes, generally	79	20	1

These values show Negroes at the bottom of the list; but as Kroeber points out (*Anthropology*, 1923) suspicion is aroused by the fact that Italians and Poles stand much nearer the Negroes than to other whites. A different tabulation shows other results:

	Below	Middle	Above
Negroes, Northern States	46	51	3
Italians	63	36	1
Negroes, Southern States	86	14	0.3

Further, comparisons of literates and illiterates show that New York Negroes are nearly on a par with Alabama whites, among literates, and a bit ahead of them among illiterates. "Evidently, the psychological tests are more a gauge of educational and social opportunity than of race." Annual summaries on race differences appear in *The Psychological Bulletin*.

The Army examination also showed a surprisingly high proportion of physical defectives. They were not uniformly distributed over the country, nor by race and nationality, so that social causes may be suspected. Consult Love and Davenport, *Physical Examination of the First Million Draft Recruits* (1910); *Defects Found in Drafted Men* (1920). A general programme for aims and results in studying the whole population is F. Boas's "Report on an Anthropometric Investigation of the Population of

the United States" (*Jour. Amer. Statistical Assn.*, 1922, 181).

While the alarmists had the public ear so long as war passions held sway, there has been a return to saner views in later years. Typical of this is F. H. Hankins' *The Racial Basis of Civilization* (1926). He does not deny all the importance of social and cultural factors in race achievement, but holds that race itself has some part, indeed a considerable part, in cultural development. Races are not equal in native endowment; they have fundamentally the same capacities, but they have these qualities in different degrees of development. He believes in the capacity but not the unique value of the Nordics, in the definite inferiority of the Negroids, but not of the Alpines and Mediterraneans, and insists on the overlapping of all human groups. There is no living group that is a "pure race," not even the Nordics; but instead of viewing this fact with consternation, he points out that the interbreeding of good stocks is to be encouraged. For in this way, the variability of groups is increased, with the appearance of leaders of heightened degrees of intelligence at the upper end of the range, and even new and valuable combinations of endowment appear. So far as the internal composition of our population goes, he holds no alarmist view that the less successful elements should be stamped out, or removed from controlling the social structure by some caste system, but rather that our concern should be with creating better conditions for the more successful to continue their contribution to the biological strain. Applied as an immigration policy: "America could do no better than to make itself a world asylum for persons of superior quality regardless of race or color."

Exemplary caution also characterizes S. J. Holmes's *The Trend of the Race* (1921) and *Studies in Evolution and Eugenics* (1923). In his view, however, so long as the evidence on good or evil effects of race-crossing is conflicting, it were preferable to discountenance it.

**Bibliography.** The literature on eugenics is enormous, as is indicated by the huge *Bibliography of Eugenics* (1924) compiled by S. J. Holmes, and new accessions are appearing at an increasing rate. A brief selection of the more recent significant works in this compendium was published by the American Eugenics Society, (1925). Among recent works are L. Darwin, *The Need of Eugenic Reform* (1926); R. Pearl, *The Biology of Death* (1922); E. B. Reuter, *Population Problems* (1923); L. I. Terman, *Genetic Studies of Genius* (1925); Estabrook and McDougall, *Mongrel Virginians* (1926); H. H. Laughlin, *Eugenic Sterilization in the United States* (1922); H. Olson et al., *Research Studies in Crime* (1925); J. W. Jenks and W. J. Lauck, *The Immigration Problem* (1926); and the current issues of *The Eugenics Review*. See **RACE PROBLEMS**.

**EULENBURG**, o'leñ-böörk, FRANZ (1867- ). A German economist; born and educated in Berlin. He began teaching in Leipzig in 1899. From there he went to Aachen. In 1919 he became professor of political economy and statistics in the University of Kiel and in 1921 in the Handelshochschule, Berlin. His works include: *The Possibility and Results of a Social Psychology* (1900); *Society and Nature* (1905); *The Modern Philosophy of History* (1907); *The International Money Market* (1908); *The Rise in Prices during the Last Ten Years* (1912);

*Money in War* (1915); *The New Industry* (1919); *Arten und Stufen der Sozialisierung* (1920), and *Weltwirtschaftliche Solidarität der Völker* (1922).

**EUPEN, MALMÉDY, and MORESNET.** To satisfy Belgian demands for protection and for reparations, Articles 34-39 of the Treaty of Versailles provided for the cession to Belgium by Germany of the frontier districts of Eupen (area 68 square miles; population, 26,156), Malmédy (area 314 square miles, population, 34,708), and the disputed neutral district of Moresnet (area 2 square miles; population, 3038), together with a small portion of Prussian Moresnet. The regions in question had undergone steady Germanization since their acquisition by Prussia in 1815, so that the end of the War saw the original Walloon population so reduced that only one-sixth of the population could speak French. To the Peace Commissioners, other considerations were weightier than the question of language, which made the transfer of territory justifiable. Aside from the strategic argument, it was maintained that the orientation of the districts was toward Belgium, that there were profound historical ties, and that the necessity for compensating Belgium for the forests destroyed during the War favored the decision. For this last reason, too, Germany was compelled to turn over to Belgium the domanial and communal woods of Prussian Moresnet.

**EUROPE.** The World War (1914-1918) and the revolutions in Russia, Austria-Hungary, and Germany which attended it led to a profound metamorphosis in European political geography. The cataclysmic changes registered in the peace settlement of Paris (1919-1920) with subsequent modifications and supplementary arrangements, surpassed in scope and significance such stages in the evolution of the modern state-system as were signalized by the Treaties of Westphalia (1648), the Peace of Utrecht (1713-1714), and the Congress of Vienna (1814-1815). The territorial readjustments following the World War involved directly or indirectly every state in Europe except Portugal, Spain, and Switzerland. Western Europe was little transformed, the most notable exceptions being Alsace-Lorraine and Ireland. Central and Eastern Europe, on the other hand, were almost completely reorganized on a national basis and to a large extent republicanized and democratized. The three great non-nationalistic empires of Austria-Hungary, Russia, and Germany were dismembered and the diminutive state of Montenegro disappeared. A solid belt of eight new national states emerged in Central Europe, viz: Austria, Hungary, Czechoslovakia, Poland, Lithuania, Latvia, Estonia, and Finland, while contemporaneously the respective national unifications of Italy, Serbia, Rumania, and Greece were virtually completed and the nationalistic grievances of France and Denmark adequately redressed through the restitution of Alsace-Lorraine and Northern Schleswig. Such, in broad outlines, was the territorial resettlement of Europe. See the articles on the various states of Europe.

**EUROPEAN CORN BORER.** See **ENTOMOLOGY, ECONOMIC**.

**EUROPEAN WAR, 1914-1918.** See **WORLD WAR**.

**EVANGELICAL CHURCH.** A denomination which is Arminian in doctrine; established in 1922 by the union of the Evangelical Association and the United Evangelical Church. The



Evangelical Association was the outgrowth of a religious movement started in Pennsylvania in 1800 under the direction of John Albright. Differences arose in the church culminating in a division in 1891, and a large number of ministers and members organized themselves into the United Evangelical Church in 1892. The separate existence of the two bodies continued until it was felt that the two churches should be reunited to find articulate expression, and a series of meetings of commissions, appointed to consider union and federation, resulted in a merger in 1922.

The Evangelical Association increased in number of communicants from 150,380 in 1914 to 167,416 at the time of the merging; the Sunday-school enrollment, from 227,820 to 271,758; and the valuation of church property, from \$11,699,452 to \$16,281,011. Similarly, the membership of the United Evangelical Church was increased from 79,292 in 1914 to 92,001 at the time of merging, and the total value of church property from \$5,476,602 to \$9,515,328. In 1928 the Evangelical Church had a total membership of 258,214; itinerant preachers numbered 1973, and local preachers, 475. Sunday schools numbered 2849 and enrollment amounted to 372,943; church property was valued at \$39,682,707, and contributions during the year amounted to \$7,040,800, an average of \$27.31 per member. Missionary work, which has always been a dominant purpose of the denomination, found expression in local work and in the maintenance of foreign missions in Japan, China, Germany, Poland, Latvia, France, Switzerland, Russia, Africa, and Canada. The church also maintained the following educational institutions: North Central College and Evangelical School of Theology, Naperville, Ill.; Western Union College, Le Mars, Iowa; Albright College, Myers-town Pa.; Schuylkill College and School of Theology, Reading, Pa. Other philanthropic enterprises included two orphanages, six homes for the aged, and several hospitals.

**EVANGELICAL SYNOD OF NORTH AMERICA, THE.** A religious communion, strictly evangelical in principle as historically crystallized from the Reformation of the sixteenth century and as embodied in the Reformed and Lutheran doctrinal statements, accepting these statements as far as they agree. Where they disagree, however, the Evangelical Synod adheres strictly to the passages of Holy Scripture bearing on the subject and avails itself of the liberty of conscience prevailing in the Evangelical Church. The communion was organized in 1840 at Gravois Settlement, Missouri, and consolidated in 1877 with similar communions. The church is organized in 19 districts with extensive power of self-government. Presidents of districts, clerical delegates, and lay delegates meet in General Conference every fourth year. A quadrennial Conference was held in 1925 and an Extraordinary General Conference adopted a new constitution in 1927. In recent years, the organization has remained practically the same size, communicant members being estimated in both 1918 and 1927 at 350,000; there were 1131 pastors in the earlier year, and 1197 in the latter. The property of the 1400 churches in 1918 was valued at \$18,281,415, and the property of the 1267 congregations in 1927 amounted to \$38,463,860. In the United States, by 1927, there were over 100 missionaries, men and women, active in about 135 communities. The Board of

Foreign Missions reported an income of over \$171,522 for 1927, and had 14 men, two of them medical workers, and 18 women as missionaries in India, in addition to 333 native workers. In Honduras there were 11 missionaries at two stations. The denomination maintains four institutions of learning: Eden Theological Seminary, St. Louis, Mo.; Elmhurst College, Elmhurst, Ill.; Robinson Academy, Waco, Texas; and Oakland Institute, Cincinnati, Ohio. Periodicals published are *Der Friedensbote*, *The Evangelical Herald*, and *The Light Bearer*.

**EVANS, SIR ARTHUR JOHN** (1851- ). A British archaeologist (see VOL. VIII). He added to his studies of ancient Cretan civilization *Palace of Minos I*, published in two parts in 1922 and 1928.

**EVANS, EDWARD RADCLIFFE GARTH RUSSELL** (1881- ). A British explorer and naval officer (see VOL. VIII). In 1914 he commanded the *Mohawk* in the bombardment of the right wing of the German Army on the Belgian coast and in 1917 took command of the *Broke*. In 1921, as commander of the *Carlisle* (1921-23), he saved 228 Chinese from drowning in the Hong Mok disaster. He received the D. S. O. in 1917 and has been decorated by many governments and societies. He published *Keeping the Seas* (1920), and *South with Scott* (1921).

**EVANS, RUDOLPH** (1878- ). An American sculptor born at Washington, D. C. He studied at the Corcoran Art School, Washington, the Art Student's League, New York, Julien's Academy and the École des Beaux Arts, Paris. He was a pupil of Falguière and Rodin and was elected Associate of the National Academy in 1919, when he won the Watrous Gold Medal. His best-known sculpture is the "Golden Hour," the original of which is in F. A. Vanderlip's garden at Scarborough, N. Y., a copy in the Luxembourg Museum, and a marble replica in the Metropolitan Museum, New York. Mr. Evans has the capacity to catch in his portraits the aloofness of childhood. Besides portraits of young people, he has made monuments and portrait busts of financiers, including Frank A. Vanderlip, John D. Rockefeller, Jr., and Thomas F. Ryan. His superb "Boy and Panther" was exhibited in 1923.

**EVANS, WILLIAM** (1870- ). An American theologian, born at Liverpool, England, and educated in private schools in England and at the Moody Bible Institute (Chicago), the Chicago Lutheran Theological Seminary, and the Theological Seminary of the University of Chicago. He was ordained in the Congregational ministry in 1894, was director of the Bible course at the Moody Bible Institute (1901-15), associate dean of the Bible Institute in Los Angeles (1915-18), and director of Bible conferences for the United States and Canada (1918- ). He wrote *The Book of Books* (1902); *Personal Soul-Winning* (1910); *Studies in the Life of the Christian* (1911); *The Great Doctrines of the Bible* (1912, 1920); *Through the Bible*—Series of 10 vols. on Bible Exposition (1916-18; incomplete); *The Book Method of Bible Study* (1915); *Epochs in the Life of Christ* (1916); *The Shepherd's Psalm: a Meditation* (1921); *The Coming King: the World's Next Great Crisis* (1923).

**EVARTS, HAL G.** (1887- ). An American author born at Topeka, Kan. After a varied career as rancher, trapper, and licensed guide, he turned to writing. He published:

*The Cross Bull* (1920); *The Bald Face* (1921); *Passing of the Old West* (1921); *The Yellow Horde* (1921); *Fur Sign* (1923); *Tumble Weeds* (1923); *Spanish Acres* (1925); *The Painted Stallion* (1926); *The Moccasin Telegraph* (1927); *Tomahawk Rights* (1929).

**EVE, ARTHUR STEWART** (1862- ). A Canadian physicist, born at Silsoe, Bedfordshire, England. He was educated at Cambridge, and in 1903 became Macdonald professor of physics, McGill University, Montreal, Canada. He commanded the 148th Overseas Battalion in the World War, and was director of research, Admiralty Experimental Station, Harwich, 1917-18. In 1919 he became director of physics at McGill University. He has published various papers (mainly in the *Philosophical Magazine*) on radioactivity and ionization.

**EVERWIJN, JAN CHARLES AUGUST** (1873- ). A Dutch diplomat born at Noordwijk, Holland. He studied law at Leiden University, and was a lawyer at The Hague (1897), entering the government service in the following year. He was president of the Netherlands Organization for the International Chamber of Commerce (1920); delegate at the Paris Conference for economic relief (1920); and minister from the Netherlands to the United States (Aug. 1, 1921-July, 1922).

**EVJEN, JOHN OLUF** (1874- ). An American educator, born at Ishpeming, Mich., and educated at Augsburg Seminary (Minneapolis), the University of Minnesota, and the University of Leipzig. In 1903 he was ordained in the Lutheran ministry. He was professor of theology at Augsburg Seminary (1909-19); president of the State Normal School at Mayville, N. D. (1919-23); and professor of history and modern languages at Carthage (Ill.) College, (1923-24). In 1924 he became professor of theology in Hamma Divinity School, Wiltenberg College, Springfield, Ohio. He wrote *Scandinavia and the Book of Concord* (1905); *Lutheran Germany and the Book of Concord* (1911); *Scandinavian Immigrants in New York, 1630-1674* (1916); *Naadegaaverne og Embedet* (1920); *The Teachers' College—Its Place in the Educational System* (1920); *The Berkenmeyer Library* (1925); *Work and Requirements of a Graduate School of Theology* (1926).

**EVOLUTION.** The belief that animals and plants now on the earth have arisen, not as was earlier supposed, through separate, independent, and more or less arbitrary acts of Creation, but through modifications of preexisting species, these from earlier species, and so on back to the origin of life, that being at present an unexplained mystery. For a summary of the evidence upon which this belief is based, consult article **EVOLUTION**, Vol. VIII.

At the present time, while there is universal agreement among scientists in accepting the general theory of evolution, there is a decided lack of agreement as to the relative values to be put on the proposed explanations of the process. The condition is analogous to that of a Protestant and a Catholic who disagree on points of doctrine but agree on the fundamental principles of Christianity. In both cases, this lack of agreement seems to be due to differences of temperament or of training, but while in religion no such conclusion would be drawn, unfortunately in the case of evolution this lack of agreement is claimed by hostile critics to mean that the theory has been largely aban-

doned. When William Bateson, the British biologist, at the meeting of the American Association for the Advancement of Science in 1921, emphasized on the one hand his belief in evolution, but on the other hand stated that we are still ignorant concerning the way in which new species arise, William Jennings Bryan quoted the second statement (ignoring the first) as proof that biologists are abandoning the whole evolution programme or at least show such lack of agreement concerning it as seriously to discredit the theory. Again, Weismann, through his critical studies on the effects of use and disuse, founded the school calling itself "Darwinian," but who outdarwined Darwin in claiming natural selection as the *only* explanation. The practical abandonment of this extreme position has been misinterpreted by those who fail to realize that "Darwinism" in this sense is not the same as "Evolution." Obviously, the present-day problem is the discovery of the factors at work in the evolutionary process.

Of the various proposed explanations, natural selection is the one most generally employed, its severest critics having been forced to accept it as playing at least a subsidiary part. It would appear, however, that important modifications of the original theory must be made. In the first place, it is probable that the severity of the struggle for existence has been overestimated. "Nature is stern but she has her tolerant moods," and it is questionable if minor variations have the rigid life-and-death-determining importance they were formerly supposed to possess. If this is the case, we must discover some other cause for the origin of new species which often differ from the old in what seem to us unimportant structural details.

In the second place, difficulties arise through recently acquired information concerning the effects of selection on individual variations. Any group of plants or animals, considered with respect to any particular character, will show a considerable range of variability for that character, varying both above and below the mean or average. Darwin thought that selection of extreme variates above or below the mean and a breeding from these variates would result in a new range of variability in the selected direction and the establishment of a new mean. Practically all the results obtained by experiment along these lines have negated this conclusion, and it generally happens, if not always, that the offspring of an extreme variant normally arrange themselves around the mean of the whole race irrespective of the degree of variation of the parent.

A large number of zoologists join with botanists in ascribing the origin of new species and new adaptations to mutation, a position we very largely owe to the work of the botanist, De Vries. The mutation theory supposes that from some causes not fully understood but which certainly exist, there appear at intervals changes in the hereditary material such as to lead to the establishment of a new mean with a new range of variability. Such a change is called a mutation. A mutation may be very slight in amount, so as to resemble a mere individual variation, or it may be large as in the fruit fly, when the normal red eye is replaced by a white one. In any case it is recognizable by its heritability and its establishment of a new mean. It is believed that natural selection first operates after this mutation has appeared and determines

whether or not it shall survive. Natural selection, then, as De Vries has expressed it, "has nothing to do with the arrival of a species but determines its survival."

The oldest explanation of evolution is that of use and disuse, originally proposed by Lamarck, and to a large extent accepted by Darwin. With the rise of the "Darwinian" school, (as defined above) this Lamarckian factor seemed definitely to be disproved, but with the decline of "Darwinism" it has again come to the front. The main difficulty is to discover how it is possible for somatic changes to affect the germ plasm. Throughout the discussion there have been many who admitted this difficulty but who nevertheless felt that such a modification must have occurred, otherwise actually observed changes could not have taken place. Recent work on antibodies, hormones, X-rays, and radium, seem possibly to point the way to the desired explanation. See HEREDITY.

A conservative statement is that at the present time the theory of use and disuse is stronger than it has been since Weismann's work in 1889 seemed entirely to discredit it; not so much in its general acceptance (for before Weismann it was widely adopted in an entirely uncritical fashion), but in that there is now promise of an explanation of the mechanisms at work in such a process.

In a strictly natural selection explanation of evolution, it is assumed that from generation to generation variations normally appear in all directions around a mean, and natural selection operates by eliminating all but the most favorable of these. Eimer in insects and Whitman in pigeons found reason to believe that in these animals variations affecting any one organ or part show a decided tendency to occur in only one general direction, rather than in all directions. This principle, known as *orthogenesis*, has been proposed as an explanation of why, in many cases, organs so obviously disadvantageous to an animal, have persisted. It is, for example, generally thought that the enormous unwieldy horns of an Irish Elk were largely responsible for its becoming extinct. Spencer attributed the size of these horns to the inherited effects of use, but in this case it is difficult to see why natural selection should not have kept the size within limits by the elimination of the most unfavorable variations, and the consequent preservation of the fittest. Orthogenesis assumes an inherent tendency to vary in one direction even though the result is fatal to the race. Why variations should appear in only one direction is not, with our present information, any easier to explain than why variations should appear at all. In the last analysis, this must be referred to the unstable structure of protoplasm, though this is obviously a restatement, rather than a solution, of the problem. It is certain that orthogenesis sometimes occurs, and this fact should be kept in mind in any discussion of evolution.

Evidently, evolution has been an exceedingly complicated process, involving several causes, or factors, sometimes working singly, at other times in coöperation, and difficulties in interpretation have arisen because undue emphasis was laid upon one factor to the exclusion of others. It is quite possible that further research will bring to light factors at present unknown.

**Bibliography.** Recent works on evolution that may be consulted with advantage are H.

F. Osborn, *From the Greeks to Darwin*, rev. ed. (New York, 1929); H. W. Shimer, *Evolution and Man* (Boston, 1929); Frances Mason, ed., *Creation by Evolution*, a consensus of present-day knowledge by leading authorities (New York, 1928); H. H. Newman, ed., *The Nature of the World and Man* (Chicago, 1928).

See ANTHROPOLOGY; BOTANY; HEREDITY; ZOOLOGY.

**EWART, D'ART, JAMES COSSAR** (1851- ). A Scottish naturalist (see Vol. VIII). In 1927 he retired from the Regius professorship of natural history at Edinburgh University, a chair he had held since 1882. His later books include: *Domestic Sheep and Their Wild Ancestors* (1913); *Development of the Horse* (1915); *Moultling of the King Penguin* (1917); *The Nestling Feathers of the Mallard* (1921).

**EWELL, ARTHUR WOOLSEY** (1873- ). An American physicist (see Vol. VIII). He was appointed commanding captain of the United States Reserves on Dec. 15, 1917, and head of the bomb unit of the Air Service of the American Expeditionary Forces. After the Armistice, he was placed in charge of the experimental development and tests of bombs for the War Department.

**EWING, JAMES** (1866- ). An American pathologist (see Vol. VIII). In 1919-27 Dr. Ewing brought out his monumental work on tumors, entitled *Neoplastic Diseases*.

**EWING, SIR (JAMES) ALFRED** (1855- ). A Scottish physicist and engineer (see Vol. VIII). During the World War, he was in charge of the Admiralty department which successfully intercepted and decoded important German cipher messages. In 1916 he became principal and vice-chancellor of the University of Edinburgh. His latest work is *Thermodynamics for Engineers* (1920).

**EXCESS PROFITS TAX.** See TAXATION IN THE UNITED STATES.

**EXCHANGE, FOREIGN.** See FINANCE AND BANKING.

**EXPERIMENTAL PSYCHOLOGY.** See CONSCIOUSNESS AND THE UNCONSCIOUS. PSYCHOLOGY, EXPERIMENTAL.

**EXPERIMENT STATIONS, AGRICULTURAL.** See AGRICULTURAL EXPERIMENT STATIONS.

**EXPLORATION.** Although exploration did not cease during the World War and the years following, there was a noticeable diminution in the number of expeditions during the years 1914-1918. The War and the resulting changed conditions introduced new aims and methods of exploration. The use of the airplane, both as a medium of transportation and as a means of mapping, was the chief innovation. With the exception of the Polar Regions, no lands of great extent remained completely unknown and post-war exploration has concerned itself with investigating the natural resources of a particular region or with tracing its past. With the establishment of mandates, the nations applied themselves to ascertaining the climate, fauna, flora, mineral resources and soil conditions of their new possessions. Some studies of the natural environment were made to encourage emigration. American organizations, which have been especially active in the archaeological and ethnological fields, have initiated research and enlarged their collections for the use of scientists and public instruction. European institutions were practically forced to cease such activity during and immediately following the

War, but recently they have resumed their old position in the field of exploration.

**Africa.** See AFRICA, under *Exploration*.

**Arabia.** See ARABIA, under *Explorations*.

**Arctic Regions.** See POLAR RESEARCH.

**Asia.** Central Asia has been the goal of many expeditions. Andrews, for the American Museum of Natural History, conducted extensive geological and archaeological surveys in Mongolia with a view to ascertaining more about the early history of man. Sven Hedin returned again and again to his explorations in Tibet. Kosloff made some notable archaeological discoveries in the course of his Central Asian expeditions. Roerich made two expeditions to Tibet for the purpose of painting and collecting philosophical data. Sir A. Stein spent a number of years in the little-known parts of Persia, Afghanistan, and Baluchistan. Expeditions visited the Pamirs and mapped much of that intricate country. The Morden Clark Expedition of the American Museum of Natural History collected big game in Central Asia, as did the Roosevelts. A great number of Soviet expeditions have been sent to study the little-known natural resources and ethnology of the Soviet Republics in Asia. In Siberia, Obruchev discovered a range of high mountains; Professor Kulik headed an expedition which located an enormous meteor. The Lake Baikal region was the centre of intensified study. The Freer Gallery at Washington conducted several archaeological expeditions in China. In India, a German ethnological expedition made extensive observations. For archaeological investigations in Asia Minor, see ARCHAEOLOGY.

**Australia.** Extended exploration in Western Australia resulted in a more careful classification of the land. Utilization depends on rainfall and irrigation possibilities were investigated. The Great Barrier Reef Expedition studying the formation and economic potentialities of this huge coral reef began work. Several scientific institutions united for the purpose of studying the native life before advancing civilization destroyed their aboriginal culture.

**Europe.** Excavations in France and Italy disclosed ancient ruins of unknown periods. Ethnographic researches were made in southern France, northern Spain and the British Isles. The construction of a war railway to the Murman Coast brought information on the hitherto unknown region of the Kola Peninsula.

**North America.** **Alaska.** The U. S. Geological Survey kept a number of field expeditions engaged in reconnaissance work each year. Notable work was that of mapping the Naval Petroleum Reserve in northern Alaska and of S. R. Capps, who mapped much of the Mt. Spurr area. The National Geographic Society sponsored a survey under Jaggar in the volcanic area of southern Alaska. Hrdlicka in 1926 made a preliminary anthropological survey for the Smithsonian Institution and this was followed by more detailed studies. In 1928 the Stoll-McCracken Expedition of the American Museum of Natural History discovered some early mummies on an island in the Aleutians. The U. S. Navy sponsored an extensive aerial mapping expedition in 1926 which photographed much of the involved topography of southeastern Alaska.

**Canada.** The Northwest Territories were the scene of annual government patrols and explorations. Radical changes in the map of the

Great Slave Lake area have resulted. Surveys of the condition of game in this territory were made in order that provision for the natives might be made. Airplane surveys of much of the pioneer fringe of Canada were made. An airplane and ice-breaker expedition tested the practicability of Hudson Bay as a point of export for the Canadian grain crop. Mountain climbing expeditions have been numerous; Mount Logan was conquered; Mystery Mountain, the highest in British Columbia, was discovered and the Columbia Glacier was studied. The Canadian Arctic Archipelago was visited regularly by patrols of Royal Canadian Mounted Police and a steamer was regularly sent to Ellesmere Island and Baffin Island.

**United States.** In the United States, scientific field research is annually pursued by American universities, scientific societies, museums, and State and Federal bureaus. This field work covers all phases of investigation into our natural resources. Recently, there has been great activity along archaeological lines. See ETHNOLOGY. Some of the principal institutions sending their expeditions to all parts of the world are the Field Museum of Chicago, Museum of the American Indian, Heye Foundation, the American Museum of Natural History, the Pennsylvania University Museum, the Carnegie Institution of Washington, the National Geographic Society, and the Smithsonian Institution.

**Central America, Caribbean.** Study of the natural resources of these countries continued slowly. Archaeological investigations were the most significant, especially those in Yucatan, Guatemala, and British Honduras. The New York Academy of Science continued its study of the natural history of the Virgin Islands and Porto Rico. Barro Colorado Island in the Panama Canal developed into a centre for tropical research. Studies of sedimentation were initiated by Professor Field of Princeton. William Beebe continued his oceanographical studies.

**South America.** The Amazon Valley was the centre for a number of prominent expeditions. The Rice Expedition to the Rio Grande mapped some of its northern tributaries. Dyott retraced Roosevelt's expedition down the River of Doubt and later went into Matto Grosso to search for the missing Fawcett Expedition. Dr. and Mrs. Dickey made several ethnological trips into southern Colombia and Venezuela. Mr. Tate of the American Museum of Natural History collected birds and mammals at key points. The Captain Marshall Field Expeditions of the Field Museum made large palaeontological collections in Argentina. Mountain-climbing expeditions to the Andes have been numerous and recently the airplane has been used to map some areas in detail.

**Oceania.** The islands of the Pacific have been visited by many ethnographical and archaeological expeditions, particularly those from the Bishop Museum of Honolulu. The Whitney South Seas Expedition made large oceanographic collections. The Burden Expedition to Komodo collected giant lizards for the American Museum of Natural History. The Stirling Expedition of the Smithsonian Institution penetrated the unknown regions of New Guinea and discovered a pigmy race. A British Expedition up the Fly and Sepik rivers was also undertaken.

**Oceanography.** Marine biology particularly the breeding and growth and migration of edible fish occupied much of the attention of ocean-

ographers, as well as the more routine studies of currents, depths, and deposits. The United States thus investigated its own waters and European scientists, British, Danish, French and Swedish, explored the North Sea, the Mediterranean, and the Atlantic waters from the English Channel to Madeira. After 1914 the United States participated in an International Ice Patrol of the North Atlantic. The non-magnetic yacht, *Carnegie*, started on another cruise around the world.

**EXPLOSIVES.** Such developments of the World War as the tremendous increase in the expenditure of artillery ammunition for preliminary bombardment of objectives, in barrage fire for protection of infantry waves advancing to the attack, in harassing fire directed on enemy back-areas, in counter-battery work, in putting up aerial barrages to fend off enemy airplanes, and the enormous increase in the employment of machine guns in lieu of the slower-firing shoulder rifle, all magnified the rôle of explosives. Progress in their manufacture was mainly toward quicker manufacture, greater safety in handling, storage, and transportation, slower deterioration after manufacture, and substitution of more abundant raw materials for those found to exist in quantities too small for ready conversion on a hitherto unprecedented scale.

**Propellants.** Smokeless powder in various forms was in universal use prior to the War, and except for the substitution of wood pulp for cotton linters in the manufacture of nitrocellulose and the development of a water-drying process which was much quicker than the former air-drying process, no outstanding improvements in its manufacture were achieved during the War.

Probably the most important development work since the War was on a smokeless, flashless, non-hygroscopic powder. Immediately after the Armistice, demands were made for a new type of propellant powder to meet such conditions as those of the War. The particular objection to the service powder of the United States Army was that it was hygroscopic and must be kept in waterproof containers up to the time of use. Another very important factor was that it was a solvent powder, requiring considerable time for drying, even making use of the so-called water-drying process developed during the War. Several experimental powders of varying composition and granulation passed satisfactory tests. In order to obtain necessary ballistic properties and yet avoid the use of solvents, nitroglycerine in very small amounts was incorporated with the other ingredients. This powder can be fired within 48 hours after manufacture but greater uniformity is obtained by allowing it to age for several days. It is completely non-hygroscopic; samples have been fired immediately after submersion in water for 24 hours.

**Bursting Charges.** Just prior to the War, trinitrotoluol (TNT) was considered the most satisfactory bursting charge for mobile artillery shells. Because of the scarcity of TNT during the War, a fairly satisfactory substitute was developed and used, 80% amatol, a mixture of 80 parts of ammonium nitrate and 20 parts of TNT. Small-caliber shells were filled largely with 50% amatol, but at best, this was a temporary expedient; the standard practice in 1924 was to use TNT without dilution. The 80%

amatol was prepared by crushing and drying ammonium nitrate, melting TNT in steam-jacketed kettles, and mixing the two components in the required proportions in a steam-jacketed mixer.

The resulting product was similar to soft brown sugar and might be tamped into the shell cavity by hammer and mallet or, as was done during the War, by means of the screw shell-filling machine, which consists of a hopper to hold the amatol in bulk and a sleeve containing a rotating worm. The shell to be filled was mounted horizontally on a wheel carriage placed so that the worm and sleeve entered it within a few inches of the bottom of the shell cavity. The amatol was fed into the shell by the rotating worm until the resistance to the entrance of more amatol caused the carriage and shell to back off from the hopper, when the worm was automatically stopped, since the cavity had been filled to a predetermined point. The remaining cavity left by the sleeve and worm was filled with liquid TNT except for a small cavity to take the booster. See COKE.

Ammonium picrate, called explosive D in the United States service, is used for bursting charges of armor-piercing projectiles, since TNT is not sufficiently insensitive to shock to withstand passage through armor plate on impact without exploding. Ammonium picrate will do this and still be in condition to give effective fragmentation on perforation of heavy armor plate. In loading ammonium picrate in armor-piercing projectiles, small quantities of the crystalline explosive are given a preliminary amount of tamping in the nose of the shell, followed by hydraulically pressing successive increments as needed to fill the shell cavity completely and with proper density. The bursting charge for shrapnel continued to be black powder, according to standard practice prior to the War. The ammunition used with trench mortars developed during the War was filled with a nitrostarch explosive for the smaller calibres and either 80% or 50% amatol for the larger calibres. Hand grenades were loaded principally with nitrostarch explosives, and rifle grenades with TNT. Aircraft bombs were loaded with 80% amatol during the War; subsequent practice was to use TNT without dilution.

**Booster Charges.** During the War, attempts were made to load boosters with tetryl around the fuse socket, filling the remainder of the booster with TNT. This was abandoned in favor of completely filling the booster with tetryl. This practice later became standard with the Ordnance Department.

**Detonators.** Mercury fulminate maintained its position as the premier military detonator. It is manufactured by dissolving mercury in nitric acid, pouring the solution into grain alcohol, and removing and washing the gray crystals of mercury fulminate thus precipitated. Mercury fulminate is the most sensitive, most powerful, and most expensive of military explosives. It costs more than twice as much as tetryl and about five times as much as TNT. The bursting of an artillery shell is in reality a series of explosions. On impact with the ground the firing mechanism of the fuse delivers a minute flash to the mercury fulminate detonator. It detonates and transmits the explosive wave to the tetryl of the booster charge surrounding it. The booster in turn causes the detonation of



the TNT in the main bursting charge of the shell. By utilizing this step-up method, small quantities of expensive and highly sensitive explosives are used to set off successively larger quantities of less sensitive explosives. Consult McFarland, *Ordnance and Gunnery* (New York, 1929). See *ORDNANCE*.

**EXTENSION COURSES.** These courses are organized and conducted in many forms by a variety of American institutions, educational and other, and are part of a general adult-education movement which has been greatly accelerated since the World War. Since the early nineties, the universities of the U. S. have been gradually developing an extension programme. For a great many years, extension courses were limited in most institutions to instruction by correspondence. This form of extension teaching was developed particularly by the University of Chicago and various large State universities of the Middle West. More recently, extension classes have been organized in large numbers and have attracted enormous enrollments particularly in the large urban universities. These classes are held in the late afternoons, evenings and on Saturdays for the benefit of those who through other occupations cannot accommodate themselves to the requirements of the usual formal curriculum. A popular development has come in the form of short courses in subjects of interest to a particular social, industrial, or professional group.

There is considerable difference of opinion as to the advisability of giving academic credit for extension teaching. In some institutions, partial credit toward an academic degree is granted; that is, a certain proportion of the total number of credit points necessary before a degree is awarded may be taken through the medium of extension courses. This proportion varies even in the institutions where credit is allowed, but the maximum credit allowed at any institution is 50 per cent.

The popularity and usefulness of extension courses is reflected in the heavy registrations, particularly in the large centres of population. California, Columbia, Pennsylvania and New York University have made remarkable strides in this field and the growing interest in adult education as a whole is an indication that the number enrolling each year will increase rather than decrease.

In both England and America, university extension began with lectures in the field of the physical sciences. There is practically no limitation of the scope of the subjects taught at the present time; and in addition to topics usually associated with a liberal-arts programme, there are many demands for instruction of utilitarian value solely. Extension teaching has therefore been one of the most important direct public-service arms of a modern American university which conducts it. Fields represented in the average extension curriculum are agriculture, the ancient languages, art, astronomy, chemistry, commerce, economics, education, engineering, English, geography, geology, German, history, household arts, law, mathematics, music, the natural sciences, philosophy, physiology, psychology, religion, the romance languages, and sociology. The subjects of the short courses, for which academic credit as a rule is not given, are limitless.

Extension centres in towns within reach of the educational facilities of the large universities have grown in considerable numbers and extramural work has come to be one of the regular arms of extension teaching. In some cities these centres have regular equipment, buildings and laboratories of their own and separate administrative and teaching staffs are built up. State universities arrange for this extramural work extensively, and with the development of the possibilities of radio in education, extension teaching can be carried on simultaneously over an entire State area. Another modern tendency is to provide post-graduate professional training. This is possible chiefly in cities where hospital, library, and laboratory facilities are available.

Methods of administration and conduct of extension courses vary widely. The authorities at some institutions feel that, to be of greatest value and usefulness, extension teaching should be just as much a responsibility of the central educational authority as any other form of teaching. At other institutions, it is a policy to regard extension teaching as a specialty and a separate faculty and a separate corps of administrators is set up. At institutions where extension teaching has proved its value, instructors of all academic grades, from lecturer to full professor, conduct classes. Enrollments are drawn from almost every section of the population, and ages vary from the late teens to the sixties and even to the seventies. The most popular subjects are those in education, chosen largely by teachers in an institution which gives academic credit for extension work; in English, business, engineering, and the sciences, where they are offered; and general liberal-arts subjects.

That extension courses have come to stay and that they will undergo further development is well demonstrated by the existence and activity of the National University Extension Association, the membership of which includes upward of forty universities which have long conducted one form or another of extension teaching and which are constantly seeking to study and interpret the special fields in which their activities are engaged. This association meets annually and publishes a report of its proceedings which include discussions and reviews of current extension undertakings.

It was estimated that the total number of registrations in extension courses in colleges and universities in the United States in the year 1928-29 was approximately 300,000. See *EDUCATION IN THE UNITED STATES*.

**EXTENSION TEACHING IN AGRICULTURE.** See *AGRICULTURAL EXTENSION WORK*.

**EYRE, LAURENCE** (?- ). An American actor and playwright born in Chester, Pa. He made his debut with the Castle Stock Company in Boston in 1907, played with Julia Marlowe, and also leading characters with the Ben Greet Company. His best-known plays include: *The Things That Count* (1914); *Saxus Matheus* (first full-length play dealing entirely with Negro life, in which all the characters are colored, to be produced in America) produced at Atlantic City (1916); *Driftwood* (1917); *Mis' Nellie of N'Orleans* (1919); *Martinique* (1920); *The Merry Wives of Gotham* (1923); *One Trip of the Silver Star* (1925). *Mis' Nelly of N'Orleans* was also produced by Dion Boucicault later in London.

# F

**F**AESI, ROBERT (1883- ). A Swiss poet, essayist and dramatist, who was born in Zurich and studied at the university there and in Berlin. After some years of travel in France, Italy, Russia, and England, he returned to Zurich and published *Zuricher Idylle* (1908), *Odysseus und Nausikaa*, a tragedy (1911), *Die offenen Türen*, (1912), and *Die Fassade* (1918), comedies. He wrote verse: *Aus der Brandung: Zeitgedichte aus der Schweiz* (1917), and compiled two anthologies of Swiss poetry: *Gestalten und Wandlungen* (1920), and *Anthologia Helvetica* (1921). His most important critical works were *Paul Ernst und die Neueren Bestrebungen im Drama* (1913), *Karl Spitteler* (1917), *Rainer Maria Rilke* (1919), and *Schweizerischer Dichtung* (1922). In 1922 he became professor of German literature at the University of Zurich.

**FAGAN, JAMES BERNARD** (1873- ). An Irish dramatist (see VOL. VIII), who usually wrote comedy. His later plays were *The Wheel* (1922), *And So To Bed* (1926), and *The Great Lover* (1927).

**FAHEY, JOHN H.** (1873- ). An American banker and newspaper publisher, born at Manchester, N. H. After receiving a high-school education, he became a reporter in Manchester. He was editor and publisher of the *Boston Traveler* 1903-10, finally becoming president of the Boston Traveler Company and of the State Publishing Company. He also was president and publisher of the *Worcester Post*. He was president and publisher of the Manchester (N. H.) *Mirror*, 1922-25, and publisher of the New York *Evening Post*, 1923. In 1919-20, he was chairman of the organizing committee of the International Chamber of Commerce, and served as American director of the same body, 1921-26. In the same period, he was a member of the Senior Council of the United States Chamber of Commerce.

**FAHRENKROG, fä'rën-krög, LUDWIG (CARL WILHELM)** (1867- ). A German poet-painter, born in Rendsburg. He studied at the art academies of Hamburg and Berlin and spent some years in Italy. His mural paintings soon attracted attention, among them "Youth as the Golden Age" in the Girls' High School of Barmen, "Crucifixion" in Mulhelm, and "Descent of Christ to Hell" in Kiel. He made a sensation at the Munich Exhibition of 1902 with his "Christ Preaching," in which he presented a beardless Christ, an innovation which he subsequently justified in his writings. He has since become better known as an author. His literary works are *Geschichte Meines Glaubens* (1906); the dramas *Baldur* (1908), *Wöland* (1914), *Nornegast* (1921), and *Die Godentochter* (1921); the poems *Lucifer* (1917) and *Das Goldene Tor* (1921), the latter illustrated by himself; a history of God-lore, *Gott im Wandel der Zeiten* (1921); and *Deschaim Mahqaira* (1925).

**FAIRBANKS, CHARLES WARREN** (1852-1918). An American politician, Vice President of the United States, 1904-09 (see VOL. VIII). In 1914 he was chairman of the Indiana Republican State Convention for the third time. In 1916 he again received the Republican nomination for the Vice Presidency but was defeated.

**FAIRBANKS, DOUGLAS** (1883- ). An American actor, born in Denver, Colo. He first appeared on the stage in New York in 1901. On the legitimate stage, he played *Hawthorne of the U. S. A.*, *Frenzied Finance*, *All For a Girl*, *A Gentleman of Leisure*, *Henrietta*, *The Show Shop*, and others. After 1916 he headed his own motion-picture productions. His chief successes include *His Majesty the American*, *When the Clouds Roll By*, *The Mollycoddle*, *The Mark of Zorro*, *The Nut*, *The Three Musketeers*, *Robin Hood*, *The Thief of Bagdad*, *Don Q.*, and *The Black Pirate*.

**FAIRCHILD, BLAIR** (1877- ). An American composer, born at Belmont, Mass. Simultaneously with his academic studies at Harvard University, he took courses in composition under J. K. Paine and W. R. Spalding; later he studied piano with G. Buonamici in Florence. He went to Constantinople in 1901 as a member of the American Legation and thence to Persia. Finding that Persian music interested him more than his diplomatic duties, he went to Paris in 1903 for further study under Widor and Gannaye. His style is a combination of French impressionism and Oriental elements. Among his works are a ballet pantomime, *Dame Libellule* (Paris, 1921); the symphonic poems, *East and West*, *Zal*, *Shah Feridoun*; a sketch for orchestra, *Tamineh*; *Légende* and *Étude Symphonique* for violin and orchestra; a violin sonata; two piano trios; a string quartet; a piano quintet; six Psalms for soloists and chorus a cappella; two fugues for organ; and many songs, almost all on Oriental themes.

**FALKENHAYN, fälk'en-hin, ERICH VON** (1861-1922). A Prussian general, born at Burg Belchau, in Thorn. He entered the army in his youth and became military attaché to the legation at Paris in 1887. In 1889 he acted as military instructor and favorite of the Crown Prince of Germany and Prince Eitel Friedrich. He served in China during the Boxer Rebellion. He was promoted to lieutenant general and was made Prussian Minister of War in 1913. In 1914 at the outbreak of the World War, he became chief of the general staff of the army, and later general of the infantry. He upheld the officers whose conduct in Alsace resulted in the Zabern disorders. He received the credit for the breaking through of the Russian lines at Gorlice-Tarnow in 1915, and also planned the successful Russian and Serbian campaigns of the same year. Insisting that the War must be fought out on the Western front, he opposed von Hindenburg and Ludendorff, who urged concentrating upon the Eastern front. The un-

successful attack at Verdun of 1916 caused his removal as chief of the general staff, Hindenburg taking his place. He was given the leadership of the 9th Army in its fighting at Hermannstadt, and in 1917 of the Asiatic Corps. In 1918 and 1919, the 10th Army was commanded by him. He wrote: *Die oberste Heeresleitung in ihren wichtigsten Entschliessungen 1914-18* (1919), giving an account of the German conduct of the War, and *Der Feldzug der 9 Armee gegen die Rumänen und Russen, 1916-17* (1921).

**FALL, ALBERT BACON** (1861- ). An American public official (see Vol. VIII). He was reelected to the United States Senate for the term 1919-23, but resigned in 1921 to become Secretary of the Interior at the request of President Harding. In June, 1921, the naval oil reserves were transferred to the Department of the Interior, and in 1922 Secretary Fall signed a long pending lease of the Teapot Dome oil district in Wyoming to the Sinclair oil interests, and also a lease of the Elk Hills reserves in California to E. C. Doheny, an oil magnate. Only about one-third of the oil was held for use of the Navy. Later, Fall resigned his secretaryship. In 1924 an investigation was begun by the Public Lands Committee of the Senate, and Fall appeared before a subcommittee and denied that he had received any money from Sinclair or Doheny, but on January 24, Doheny testified before the Committee that he had "lent" Fall \$100,000 without security or interest. On July 15, Fall was indicted on three counts, the first and third relating to the alleged \$100,000 payment, the second charging conspiracy with Harry F. Sinclair in regard to the Wyoming or Teapot Dome leases, and entering into contracts without bids. Fall and Doheny were acquitted by a jury in November, 1926, of charges of conspiracy in connection with the leasing of the Elk Hills reserves. Fall and Sinclair were brought to trial on the second count in October, 1927, but a mistrial was declared November 1 after the Government had charged agents of the defendants with shadowing the jurors. Sinclair was retried and acquitted in April, 1928. The United States Supreme Court, affirming decisions of the lower courts, decided on Feb. 28, 1927, that the Elk Hills oil leases had been corruptly obtained and that the property should be returned to the Government, and on October 10 that the Teapot Dome oil leases were fraudulent and void. Fall was again placed on trial in October, 1929, and was found guilty of accepting a bribe of \$100,000 from Doheny for the lease of the Elk Hills naval oil reserve in California.

**FALL, LEO** (1873-1925). A famous Austrian composer of operettas, born at Olmütz. After receiving training from his father, a bandmaster, he studied at the Vienna Conservatory. For some years, he was operatic conductor at Berlin, Hamburg, and Cologne. His first opera, *Frau Danise*, was produced in Berlin in 1902, but made little impression. A second opera, *Irrlicht* (Mannheim, 1905), did not fare much better, nor his first operetta, *Der Rebell* (Vienna, 1905). However, the latter, in a new version as *Der liebe Augustin*, later scored an enormous success (Vienna, 1911). In 1907 two operettas were brought out in Vienna, *Der fidele Bauer* (July 5) and *Die Dollarprinzessin* (November 2), which immediately made their way to all the theatres of Austria and Germany, and placed the composer in the front rank of

the masters of sparkling comedy. The new works, which had their première in Vienna, are *Die geschiedene Frau* (1908; in New York as *The Girl in the Train*, 1910), *Brüderlein fein* (1909), *Die schöne Risetta* (1910), *Die Sirene* (1911), *Der Nachtschnellzug* (1913), *Der süsse Kavalier* (1924). The following were first produced at Berlin: *Die Studentengrafin* (1913), *Jung England* (1914), *Der künstliche Mensch* (1915), *Die Rose von Stambul* and *Die Kaiserin* (1916), *Madame Pompadour* (1922), *Die spanische Nachtigall* (1924). For London, he wrote *The Eternal Waltz* (1911). A posthumous operetta, *Jugend im Mai* was brought out in Dresden (1926). In 1924 he visited the United States and witnessed the American première of *Madame Pompadour*.

**FALLA, MANUEL DE** (1876- ). A Spanish composer, born at Cadiz. He studied at the Madrid Conservatory under Tragó (piano) and Pedrell (composition), and while still a student wrote several zarzuelas which he offered to the managers in vain. Unable to obtain a hearing in his native land, he went to Paris in 1907, where, after some hard years, Debussy and Dukas became interested in him. After his first opera, *La Vida Breve*, written in 1904, had been successful in Nice (1913) and Paris (1914), it was brought out in several cities of Spain and won recognition for the composer. De Falla then settled in Granada. Although not a prolific writer, he is the acknowledged leader of Spanish futurists. His other works are the ballets, *El Amor Brujo* (Madrid, 1915), and *El Sombrero de Tres Picos* (London, 1919), and *El Relablo del Maese Pedro* (Madrid, 1923); three pieces for orchestra, *Noches en los Jardines de España*, *En el Generalife*, and *Danza Lejana*; and piano pieces and songs.

**FALL RIVER.** A manufacturing centre and port of entry of Massachusetts. The population rose from 119,295 in 1910 to 120,485 in 1920 and to 134,300 in 1928 by estimate of the Bureau of the Census. In 1923 the city adopted the report of the city-planning board, prepared after its survey of the city begun in 1920. In 1920 the city-manager plan of government became effective. Fall River is the largest cotton manufacturing centre of the United States, the capital invested being \$50,000,000. Other manufactures include webbing, pianos, leather, belting, hats, jewelry, underwear, absorbent cotton, braids, twine, paper, boxes, and varnish. In 1925, 30,596 persons were employed in these industries and received \$28,241,000 in wages; the value of the products manufactured was \$142,885,000. The largest fuel-oil refinery in New England, of 1,000,000 barrels monthly capacity, was built at Fall River in 1922, but since that time has been changed merely to a terminal and distributing plant. In 1924 the first unit was begun of a power plant that would ultimately produce 275,000 horse power. Fall River has 27 wharves. In 1927 the total volume of its foreign commerce was 209,949 tons. The assessed valuation of property in 1927 was \$188,936,000; the net debt was \$9,893,000. On the night of Feb. 2, 1928, fire which started in old Pocasset Mills destroyed a great part of the business section of Fall River, with a loss of approximately \$4,000,000. The city has suffered from the depression in the textile industry.

**FARABEE, WILLIAM CURTIS** (1865-1925). An American anthropologist who was born in Washington, Pa. He was in charge of the de

Milchau Harvard expedition, 1913-16, of the University of Pennsylvania expedition, 1921-23, and curator of the Museum of the University of Pennsylvania since 1913. Besides his numerous contributions to anthropological and geographical magazines, he published *The Central Aravaks* (1918).

**FAR EASTERN REPUBLIC.** See **SIBERIA** AND **FAR EASTERN REPUBLIC**; **RUSSIA**; **JAPAN**.

**FARIGOULE, LOUIS.** See **ROMAINS, JULES**.

**FARMAN, far'män', HENRI** (1874- ). A French designer of aircraft (see **VOL. VIII**). He established the important factory at Billancourt which supplied many planes to the French and English armies in the World War.

**FARM BUREAUS.** See **AGRICULTURAL EXTENSION WORK**.

**FARM COOPERATION.** See **AGRICULTURAL CREDIT**; **COÖPERATION**.

**FARMING.** See **AGRICULTURE**.

**FARM INSTITUTES.** See **AGRICULTURAL EDUCATION**.

**FARM TRACTOR.** See **TRACTOR**.

**FARNELL, LEWIS RICHARD** (1856- ). An English archaeologist and writer on religion (see **VOL. VIII**). In 1919 and 1924, he was Gifford Lecturer in the University of Edinburgh, and in 1920-23 vice chancellor of the University of Oxford. His later works include *Outline History of Greek Religion* (1921); *The Attributes of God* (1925); and articles on Greek archaeology, philology, and religion in British and foreign journals.

**FARNOL, (JOHN) JEFFERY** (1878- ). An English writer of romantic fiction, who was educated in a private school. He lived in New York City (1902-10), publishing a number of short stories and for two years painting scenery for the Astor Theatre. His publications include *The Amateur Gentleman*; *The Honourable Mr. Tawnish* (dramatized in 1924); *Some War Impressions* (1918); *Black Bartlemy's Treasure* (1920); *Peregrine's Progress* (1922); *The Quest of Youth* (1927); and *Gifford of Weare* (1928).

**FARRAND, LIVINGSTON** (1807- ). An American university president, born at Newark, N. J. In 1914 he became president of the University of Colorado, and held that position until 1919. During the World War he was director in France of the International Health Board, in 1917-18, and from 1919 to 1921 was chairman of the Central Committee of the American Red Cross. In the latter year, he was chosen president of Cornell University. He contributed many articles to psychological and anthropological publications and wrote *The Basis of American History* (1904).

**FARRAND, MAX** (1869- ). An American university professor and research director (see **VOL. VIII**). He resigned his professorship of history at Yale in 1925. He was director of the division of education of the Commonwealth Fund, 1925-27. Since 1927 he has been director of research for the Henry E. Huntington Library and Art gallery, San Gabriel, Calif. He published *Development of the United States* (1918) and *Fathers of the Constitution* (1921).

**FARRAR, GERALDINE** (1882- ). An American dramatic soprano (see **VOL. VIII**). At the height of her artistic powers, she retired from the operatic stage, appearing for the last time at the Metropolitan Opera House as Zaza, in Leoncavallo's opera, on Apr. 22, 1922. After the fall of the curtain, scenes of wild enthusiasm were enacted inside the house and on the street.

For 16 consecutive seasons, she had been one of the most popular artists of the company. In 1925 she tried, with enormous success, the field of light opera, appearing in Lehar's *The Love Spell*, and two years later also returned to the serious concert-stage. Since the sensational success of her film production of *Carmen*, in 1915, she has been increasingly active in this field. In 1916 she published an autobiography, *Geraldine Farrar* (Boston).

**FARRERE, CLAUDE.** See **BARGONE, FRÉDÉRIC CHARLES**.

**FARWELL, ARTHUR** (1872- ). An American composer, born at St. Paul. He studied with Norris in Boston, Humperdinck in Berlin, and Guilmant in Paris. From 1910 to 1913, he was director of municipal concerts in New York City, and from 1915 to 1918, director of the Music School Settlement there. He then moved to Pasadena, where he devoted much time to community music. He was always deeply interested in the music of the American Indians and at various times visited Indian reservations. In 1901 he established at Newton Centre, Mass., the Wa-Wan Press for the publication of American works, especially those based on Indian themes. He was the first recipient of the Composers' Fellowship awarded by the Pasadena Music and Art Association (1921). In his compositions, he employs chiefly Indian themes. He published collections of Indian melodies and folk songs of the South and West and was known as a writer on his subject, particularly through his former associate editorship of *Musical America*. In 1927 he was lecturer and conductor at Michigan State College.

**FASCISM.** Fascism (Italian, *fascismo*) denotes an ultra-nationalistic regenerative movement which played a prominent rôle in the post-bellum development of Italy, and which spread to Spain, Bavaria, and other countries. The central impulse of Fascism was nationalism, an ideal generating in turn the determination to extricate Italy from chaos, to give her moral unity, to make her a new state, and to make it an axiom and a creed with everyone that all social progress must be through and by the nation. Fascism came into power with dramatic suddenness. The first groups of Fascisti were formed in March, 1919, at the very moment when Italy's nationalist claims to Fiume were being disputed at Paris, while within Italy communist agitators were boldly preaching not only social revolution but also anti-militarism and pacifism. The two-fold aim of the original Fascisti was to suppress communism and exalt patriotism. Taking their names from the Latin *fascies*, the bundle of rods wrapped round an ax to indicate power to punish offenders, the Fascisti assumed the right to enforce order by using violence against socialists and pacifists. Unlike members of the American Ku Klux Klan, the Fascisti did not conceal their identity; but like the Klan, they appreciated the emotional appeal of uniforms, organizations, and sonorously titled officers. Each active member of the Fascist organization wore a black shirt, oftentimes decorated with war medals; for many had fought with distinction in the World War. The organization was very elaborate, modeled on the ancient Roman imperial army. Strict discipline bound rank and file to obedience. And at the head of the movement was the forceful Benito Mussolini, a blacksmith's son, once a socialist, and later editor of the patriotic *Popolo d'Italia*.

During the early stages of the movement, two phases of activity were most notable. First and foremost, the Fascisti, as has been said, were patriots, superpatriots, and they expressed their loyalty to Italy by forcibly suppressing pacifist demonstrations, by conducting propaganda in favor of Italy's most extreme territorial claims to the Tyrol, Istria, Fiume, Dalmatia, Albania, etc.; and by inculcating a spirit of devotion, almost of worship, toward the national state. One very significant manifestation of this nationalist devotion was the scorching criticism which the Fascisti heaped on the "outworn and incapable governments which had become a menace to the development of Italy and under whose rule the authority of the state had fallen into decadence and decay." Fascist writers and speakers, with this phase of their movement in mind, often described Fascism as a "spiritual revolt." Secondly, Fascism was anti-communist. From 1919 to 1922, it waged a sort of guerrilla warfare against socialism in Italy; Fascisti roughly dispersed Socialist party meetings, raided Socialist printing offices and headquarters, and administered novel and ingenious forms of physical punishment to leading Communists. Further, it organized labor unions of its own, found work for the unemployed with Fascist capitalists, and thanks to its success in these directions, soon began to accept the affiliation of unions which deserted socialism. To prevent the landless peasants of southern Italy and Sicily from joining forces with the social revolution, the Fascisti took it on themselves in many localities to cut the Gordian knot of the agrarian problem by compelling landlords to subdivide and sell their estates, or by persuading friendly landowners to offer small plots for sale to peasants. So effective were these measures that communism in Italy was, if not annihilated, at least compelled to work underground, and even the more moderate political socialism was reduced to impotence. By 1921 Fascism, in the words of Mussolini himself, was no longer "liberation but tyranny; no longer the safeguard of the nation, but the upholding of private interests and of the most groveling and unenlightened classes existing in Italy."

As the organization became more powerful, it entered its political phase. Indeed, now that it embraced workingmen and peasants as well as bourgeois and militarists, it could no longer pursue a clear-cut policy in economic matters, nor could it survive permanently by merely talking about patriotism. Political action was a necessity as well as a logical consummation of the order's career. Gradually, the Fascisti gained control of many municipalities, using violence where votes would not avail. Then their leaders looked to Rome. Mussolini grew more insistent in his declarations that the existing parliamentary government, headed by a vacillating coalition cabinet, was unrepresentative and unworthy of Italy. Soon he had the temerity to demand for himself and his followers places in the cabinet. Meeting refusal, he became but more ambitious. In October, 1922, he compelled the Ministry to resign and installed a Fascist cabinet. See ITALY, under *History*; also MUSSOLINI.

The Fascisti preserved their organization as a sort of unofficial militia on which Mussolini could, if need be, rely; at the same time they

constituted themselves a political party for parliamentary and electioneering purposes. Though he had denounced the inefficiency and unrepresentative character of parliamentary government, Mussolini utilized Parliament to carry out his own policies, and after he had won a sweeping electoral victory, his administration became in form at least a responsible government, like its despised predecessors. One marked difference characterizing Fascist rule, however, was the fact that force was relied on as an expedient to be employed if democracy failed. "I declare," said Mussolini in 1923, "that my desire is to govern, if possible, with the consent of the majority, but in order to obtain, to foster, and to strengthen that consent, I will use all the force at my disposal." All else failing, "there is always force." This was the aspect of Fascism that appealed so strongly to ambitious leaders in Spain, Bavaria, Bulgaria, Mexico, and many another country: if votes fail, there is always violence.

In economic policy after 1922, the Fascists emphasized chiefly the reform of governmental finance. For labor, they enacted an eight-hour-day law and a collective-agreements law designed to promote collective bargaining between organized labor and organized capital. State monopolies, such as telephone service, matches, etc., were handed over to private companies, in accordance with the Fascist principle of maintaining private enterprise and combating state socialism. In religion, the Fascisti, in power, were partisans of reconciliation between Catholic and non-Catholic; they restored compulsory religious instruction; and they succeeded, in 1929, in establishing more cordial relations with the Vatican—all for the sake of that national unity which, to their way of thinking, should transcend all else.

In 1926 Mussolini sought to consolidate the economic gains of his system in the establishment of the Fascist, i. e., corporate, state. This was done through the act called "The Legal Discipline of Collective Labor Relations" which established syndicates, collective labor contracts, and labor tribunals, and prohibited lockouts and strikes. Fascist syndicalism, like other Fascist institutions, showed itself to be hierarchical and centralized. The Fascist state arrogated to itself the right to police and supervise all the activities of the syndicates. After two years, it was seen that Fascism was regarding itself not as a reactionary movement against communism, but as a continuous revolution. It evidently was coordinating Catholicism, nationalism, pragmatism, and syndicalism under the banner of imperial Rome. Its syndicalism had nothing to do with Marxian internationalism or class war. Like socialism, however, it was swallowing up the individual in a scheme of national production under the strictest of state control. The corporative idea was functioning through a bureaucracy responsible to Mussolini, and evidently the individual was being regarded as an outworn institution. However, unlike all proletarian utopias, Fascist Italy was essentially middle-class and the real gainers of the system were the industrialists. The workers, it is true, in exchange for their liberty, were getting a modicum of security; but, after all, the slaves under imperial Rome did not have less.

The logical conclusion to the political phase of Fascism came at the end of 1927 when uni-



versal suffrage was abolished. The electoral reform measure also included the following: the nomination of candidates for the Chamber of Deputies by economic guilds; the abolition of all other parties; the substitution of a single electoral constituency in place of territorial divisions; and the reduction of the size of the chamber. In effect, the right to vote was held only by those who belonged to one of the 13 syndicalist organizations and contributed dues. See ITALY.

**Bibliography.** The outstanding scholarly work on the Fascist state was published in 1928 by the Oxford University Press. It is *Making the Fascist State*, by Dr. Herbert W. Schneider of Columbia University and, besides being a dispassionate account of the birth of Fascism, is fully documented and contains a bibliography of 21 pages. The same year also saw the publication of Mussolini's autobiography.

**FATIGUE.** See PSYCHOLOGY, ABNORMAL.

**FAULHABER, MICHAEL VON** (1869- ). A Roman Catholic Cardinal of Munich, Germany, born at Heidenfeld. He studied at the Universities of Würzburg, Rome, and Oxford, was professor at the University of Strassburg, and became Bishop of Speyer (1910), Archbishop of Munich (1917), and Cardinal in 1921. He is the author of *Petrus Stirbt Nicht* (1903); *Die Vespersalmen* (1906); *Schule und Religion* (1907); *Priester und Volk* (1911); *Hirtenbriefe* (1912); *Charakterbilder aus der Biblischen Frauenwelt* (1920); *Die Freiheit der Kirche* (1913); *Waffen des Lichtes* (1918); *Das Schwert der Geister* (1918); *Trennung von Kirche und Staat* (1919); *Zeitfragen und Zeitaufgaben* (1920); and *Das Papsttum in Unserer Demokratichen Zeit* (1920).

**FAULKNER, JOHN ALFRED** (1867- ). An American church historian (see Vol. VIII). He was Stone lecturer at Princeton Theological Seminary in 1923. He published *Wesley as Sociologist, Theologian, Churchman* (1918), *Value of Study of Church History* (1920), *Modernism and the Christian Faith* (1921), and *Miraculous Birth of Our Lord* (1924).

**FAUST, CAMILLE.** See MAUCAIR, CAMILLE.

**FAUST, EDWIN STANTON** (1870-1928). An American physician, pharmacologist, and biochemist, born at Baltimore, Md. After preliminary study at Johns Hopkins, he went to Munich to study chemistry and medicine. On his return, he was associated with the department of biochemistry at John Hopkins (M. D., 1907, *honoris causa*) and later held a similar position at the University of Michigan. He returned to Strassburg to study pharmacology under Schmiedeberg and in 1908 accepted the chair in that branch at the University of Würzburg. At the outbreak of the World War, he moved to Switzerland where he died. While his work embraced the entire range of pharmacology and biochemistry, he specialized in toxicology. In 1906 he published his only monograph, *Die tierische Gifte* and in 1913 he collaborated with Schmiedeberg in bringing out the seventh edition of the latter's *Grundriss der Pharmacologie*.

**FAY, ALBERT HILL** (1871- ). An American mining engineer, born in Appleton City, Mo. He graduated from the Missouri School of Mines in 1902 and took post-graduate courses at Columbia. He was in charge of mining operations in Mexico, Alaska, and Tennessee until

1908, when he joined the editorial staff of the *Engineering and Mining Journal*. He served with the Bureau of Mines from 1911 to 1920, and from the latter date was valuation engineer with the Internal Revenue Bureau. From 1921 to 1923 he was also head of the natural resources division of that bureau. He was consulting mining engineer, 1923-25, and assistant editor of the *Engineering Mining Journal-Press* (New York), from 1925 to 1927 when he again returned to private practice. He wrote *Coal Mine Fatalities in the United States, 1870 to 1916* (1916); *Glossary of the Mining and Mineral Industry* (1920). He also wrote numerous technical bulletins.

**FAY, HENRY** (1868- ). An American chemist, born in Williamsport, Pa. He graduated from Lafayette College in 1889 and took post-graduate courses at Johns Hopkins. He was instructor at that university from 1893 to 1895, and from the latter date to 1920 was a member of the faculty of the Massachusetts Institute of Technology, becoming professor of analytical chemistry and metallography in 1920. He retired in 1926. He was also consulting chemist for several large corporations and was lecturer at the United States Military Academy and the United States Naval Academy. He wrote *Microscopic Examination of Steel*, 1917, and contributed articles on chemistry and metallography to various journals.

**FAY, SIDNEY BRADSHAW** (1876- ). An American professor of history. He was born at Washington, D. C., and received the degrees of A.B. and Ph.D. at Harvard. He also studied at the Universities of Paris and Berlin, and held a teaching fellowship at Harvard. He was professor of history at Dartmouth (1902-14) and since 1914 has held the chair of European history at Smith College. He wrote *The Origins of the World War* (1928), and edited the *Records of the Town of Hanover, N. H., 1761-1818* (1905); *A Syllabus of European History* (with Herbert D. Foster; 4th ed., 1912); *Smith College Studies in History* (1905- ), and *Fueter's World History* (1922).

**FAYANT, FRANK H.** (1876- ). An American publicist, born at Fort Plain, N. Y., and educated at Cornell University. He worked on various newspapers from 1895 to 1900, acting as war correspondent for the *New York Sun* in the West Indies from 1898 to 1900. In the latter year, he was London correspondent for the *New York Herald* and served other American magazines and journals until 1911, when he became a member of the editorial staff of the banking and currency reform campaign. He was assistant to the chairman of the National Conference Committee of the Railways, 1916-17, and assistant to the chairman of the Association of Railway Executives, 1917-20. He was vice president of Thomas F. Logan, Inc., 1919-26, and of Lord & Thomas & Logan after 1926. He is author of *Fools and Their Money* (1907), *Government and the Railroads* (1919), *To Increase Railroad Efficiency* (1922), and other works.

**FAYOLLE, fə'yöl, MARIE ÉMILE** (1852-1928). A French soldier who was born at Le Puy, Haute Loire, and educated at the École Polytechnique, where he specialized in artillery, which he later taught at the Superior School of War. By 1910 he had become a brigadier general and by 1914 had retired, but he was recalled to service at the outbreak of the World

War and given command of the artillery brigade of Vincennes and then the 70th Division of Infantry. In the following year, he led the 33d Army Corps and then the 6th Army, distinguishing himself at the Battle of Somme. In November, 1917, he became commander of the French forces in Italy, and in March, 1918, was given command of a group of armies including two American divisions, between the Marne and the Aisne. He directed the second Battle of the Marne (July 18) which precipitated Germany's defeat. After the armistice, he commanded the Army of Occupation at Pfalz, and in 1919 became a member of the Superior War Council, and chairman of the Allied commission to oversee the German disarmament. In 1920 he represented General Foch at the meeting of the American Legion, and in the following year was made a Marshal of France. In 1921 and 1922 he went on special missions to Canada and Italy. He wrote *Concentration des feux et concentration des moyens* (1913).

**FAZY**, fã'zë', HENRI (1842-1920). A Swiss Radical statesman and historian, born at Berne. He studied philosophy and law at Geneva; in 1860, he became a member of the cantonal parliament, and in 1897, a member for the remainder of his life of the cantonal executive. Like his great-uncle, James Fazy, he played a prominent part in Radical politics at Geneva. His proposal to separate the Church and State was not accepted by the Swiss until 1907. He was a member of the Swiss National Council (1896-99, 1902-20), archivist of Geneva and professor of Swiss history at the University of Geneva (1896-99, 1902-20). His *Life of James Fazy* appeared in 1890, works on the Swiss Government shortly afterward, *Histoire de Genève à l'Époque de l'Escalade, 1589-1601* (1902), and *Genève et Charles Emmanuel* (1909).

**FECHTER**, fëk'tër, PAUL (1880- ). A German editor and art critic. He has been literary and dramatic editor of the *Dresdener Neueste Nachrichten*, the *Vossische Zeitung*, and other prominent papers, and is the author of *Der Expressionismus* (1914), *Frank Wedekind* (1920), *Das Graphische Werkman Pechsteins* (1920), *Die Tragödie der Architektur* (1921), *Gerhart Hauptmann* (1922), and the novels *Die Kellerslange* (1926) and *Der Ruck im Fahrstuhl* (1927).

**FEDERAL AID ROAD ACT.** See **ROADS AND PAVEMENTS.**

**FEDERAL COUNCIL OF THE CHURCHES OF CHRIST IN AMERICA.** Founded in 1908 by the official action of 30 Protestant denominations in the United States to represent them and act for them in matters of common interest. No control is exercised over the churches; rather it is their own agency for coöperation and common expression, directed and controlled by their representatives. Four hundred members elected by the denominational assemblies compose the quadrennial Council, which met in December, 1916, 1920, 1924, and 1928. The executive committee meets annually; the administrative committee monthly.

The activities of the Council between are carried on through the various commissions. That on International Justice and Good Will, in accordance with its usual policy, conducted an educational campaign in 1925 to urge the entry of the United States in the permanent Court of International Justice, and to recommend the outlawry of war. The commission is also in-

terested in improving relations with the Orient. The Department of Research and Education publishes a weekly bulletin on social affairs, occasionally making special studies, as in 1927, a *Report on the Oil and Land Controversy between the United States and Mexico*, and *Social Aspects of Agricultural Credit*, and in 1928 reports on the bituminous coal situation, and the rural-urban milk dispute in Chicago. The purpose of the Commission on Evangelism is to unify the missionary work of the various denominations. Through the Commission on the Church and Social Service, which is especially interested in industrial relations, the churches are able to take a unified stand on social questions. A particular effort was made in 1926 to secure coöperation between national bodies and local church communities, and a new secretary was added to the Council staff to further such organization. The Commission on Church and Race Relations is mainly devoted to promoting friendship between the white and Negro races in the United States. A Church and Drama Association was formed in 1927, to encourage meritorious stage and screen productions. Other commissions are concerned with Christian education, relations with religious bodies in Europe, religious work in the Canal zone, Army and Navy chaplains, and relations with the Eastern churches.

The Council coöperates with such social organizations as the American Red Cross, the Child Welfare Movement, and the U. S. Bureau of Public Health. Representatives of certain church agencies serve on the Council administrative committee, including the Home Missions Council, the Council of Women for Home Missions, the Council of the Church Boards of Education, the American Bible Society, the Student Volunteer Movement for Foreign Missions, and the International Council of Religious Education.

A monthly, the *Federal Council Bulletin*, furnishes general religious news. The ninth survey, *The Handbook of the Churches*, was published in 1927, giving historical and statistical information concerning the Council, denominations, and various religious organizations. In 1928 Bishop Francis J. McConnell succeeded the Rev. S. Parkes Cadman as president of the Council. The national offices are at 105 East 22nd. Street, New York, and there are also offices in Washington, D. C., and in Chicago, Ill.

**FEDERAL FARM LOAN ACT.** See **AGRICULTURAL CREDIT.**

**FEDERAL HORTICULTURAL BOARD.** See **HORTICULTURE.**

**FEDERAL LAND BANKS.** See **AGRICULTURAL CREDIT; FINANCE AND BANKING.**

**FEDERAL POWER COMMISSION.** See **WATER POWER.**

**FEDERAL RESERVE BANKING SYSTEM.** See **FINANCE AND BANKING; AGRICULTURAL CREDIT; UNITED STATES**, under *History*.

**FEDERAL TERRITORY.** A territory of the Australian Commonwealth lying within the State of New South Wales. Area, 940 square miles; population in 1911, 1714; in 1928, estimated, 8385. The site for a Federal capital and a port was acquired from New South Wales in 1909 and work was begun in 1913 on the construction of the Commonwealth's capital city. An additional area of 28 miles at Jervis Bay was added for the purpose of establishing a naval college. Progress on the work was seriously retarded during the War, but in 1923

building operations were begun and in 1927 the Federal Government began to move to Canberra. Here Parliament was opened in May 9, 1927, by the Duke of York. See AUSTRALIA.

**FEDERAL TRADE COMMISSION.** See TRUSTS.

**FEDERAL WATER POWER ACT.** See WATER POWER.

**FEDERATION OF LABOR, AMERICAN.** SEE LABOR, AMERICAN FEDERATION OF.

**FEDERN, fä'dern, KARL** (1868- ). An Austrian critic, translator, and authority on Dante (see VOL. VIII). To the literature of the World War, he contributed *Die Politik der Dreiverbündeten* (1915). His later works included *Deutschland, Vergangenheit und Gegenwart* (1925). To his translations he added works of Mesnil, Croce, Cervantes, Balzac, Stendhal, and Melville's *Typee* (1927). His most recent works are *Mazarin* (1922), and *Richelieu* (1927). The latter appeared in English translation (1928).

**FEISAL, fī'zāl, (1885- )**. King of Iraq, third son of Hussain, former King of the Hedjaz, born at Taif, Turkey. He received a modern education at Mecca and Constantinople and on the restoration of his father to the emirate of Mecca in 1908, Feisal commanded the Arab contingent in the operations of the Turks against the Idrisi (1911-13). He was elected deputy for Jidda in the Turkish Parliament (1914), commanded the rebels in the Arab revolt against Turkey in 1916, and supported the Egyptian Expeditionary Force of the Allies. After the Armistice, he set up a temporary government in eastern Syria and represented the Arabian cause at the Paris Peace Conference (1919). In March of the following year, he was proclaimed King of Syria by the Syrian national government, but the plan was overturned by the entry of the French troops into Damascus. The British government recognized him as King of Iraq and head of the new state under its mandate of August, 1921. In 1923 Feisal was made a constitutional monarch by the constitutional assembly, and in 1927 he went to England to negotiate a new treaty, in which Iraq was recognized by Great Britain as an independent state. This treaty was ratified in 1928. See ARABIA and MESOPOTAMIA.

**FELAND, LOGAN** (1869- ). An American soldier, born in Hopkinsville, Ky. He graduated from the Massachusetts Institute of Technology in 1892, served in the Spanish-American War and in 1899 was appointed first lieutenant in the Marine Corps. He was promoted to be major in 1916, colonel in 1918, and brigadier general in 1920. He served in the Philippines, Panama, Cuba, and Santo Domingo. He was commander of the 5th Regiment of Marines in 1918 and the 2d Brigade of Marines in Santo Domingo in 1919-20. For distinguished service in France, he was three times awarded the Croix de Guerre with Palm, and was made an Officer of the Legion of Honor. He also received the Army D. S. M. and the Navy D. S. M. for distinguished service. He commanded the American forces on shore in Nicaragua from 1926 to 1929, when he was made commander of the Department of the Pacific.

**FELDEN, fēld'en, EMIL J.** (1874- ). A German clergyman and author, born at Montigny (near Metz), and educated at the Gymnasium and the University of Strassburg. He was made primate of St. Martini, Bremen, in 1907.

He became a member of the Bremen *Bürger-schaft* in 1920. He is the author of *Die Protestantische Kirche in Deutschland* (1902); *Kirchlicher Liberalismus und Radikalismus* (1908); *Königskinder* (1914); *Kind und Gottesglaube* (1915); *Grundriss eines Freien Religionsunterrichts* (1916); *Menschen von Morgen* (1918); *Im Kampf um Frieden* (1919); *Die Sünde des Vatikans* (1920); *Spiritismus und Andere Okkulten Systeme* (1920); *Sieghafte Menschen* (1920), *Die Sünde wider das Volk* (1921), the novels *Albert Reinkings Hohenflug* (1922), *Die Mäntel der Liebe* (1924), *Der Quellenhof* (1925), and a biography of Friedrich Ebert, entitled *Eines Menschen Weg* (1926). He became the editor of the periodical *Es Werde Licht* in 1920.

**FELLOWSHIPS.** See UNIVERSITIES AND COLLEGES.

**FELTON, LLOYD DERR** (1885- ). An American physician. He was graduated from Johns Hopkins University and became attached to the Laboratory of Bacteriology and Immunology there and later at Harvard, where he became assistant professor of hygiene and preventive medicine in 1922. In 1924, after researches pursued under the auspices of the Metropolitan Life Insurance Company, he announced the discovery of an anti-pneumonic serum which had already shown the ability to reduce greatly the mortality of that disease.

**FELTON, SAMUEL MORSE** (1853- ). An American railway official (see VOL. VIII). He was appointed director general of military railroads by the Secretary of War in 1917 and was chairman of the port and harbor facilities commission of the United States Shipping Board in 1918-19 and acting chairman of the board in 1919. He was president of the Western Railway Association and a member of several engineering and patriotic societies. He was awarded the Distinguished Service Medal for his war-time services and was awarded also the Cross of the Legion of Honor by the French government. Since 1925 he has been chairman of directors of the Chicago Great Western Railroad.

**FEMINISM.** See WOMAN SUFFRAGE; WOMEN IN INDUSTRY; PAINTING, under France; AND SCULPTURE, under United States.

**FENOLLOSA, MARY MCNELL** ("SIDNEY MCCALL") (1- ). An American author, born at Mobile, Ala., and educated at Irving Academy in that city. She is the author of entertaining stories, some of them dealing with Japan, where she lived for some years. Her works include *A Flight of Verses* (1899), *The Dragon Painter* (1906), *The Breath of the Gods* (1906, 1920), *Blossoms from a Japanese Garden* (1915), *Sunshine Beggars* (1918), *The Stirrup Latch* (1917), *Christopher Laird* (1919), and others. She edited her husband's *Epochs of Chinese and Japanese Art*.

**FERBER, EDNA** (1887- ) An American novelist and short-story writer, born at Kalamazoo, Mich. After studying at the Appleton (Wis.) High School, she became a reporter on the Appleton *Daily Crescent*, and was later employed on the Milwaukee *Journal* and Chicago *Tribune*. Miss Ferber's writings are characterized by understanding and alertness of thought. She has published *Dawn O'Hara* (1911), *Buttered Side Down* (1912), *Roast Beef Medium* (1913), *Personality Plus* (1914), *Emma McChesney & Co.* (1915), *Fanny Herself* (1917), *Cheerful by Request* (1918), *Half Portions*

(1919), *The Girls* (1921); the comedy, *Our Mrs. McWhesney* in collaboration with George V. Hobart; *Gigolo* (1922); *So Big* (1924); *Show Boat* (1926), and *Mother Knows Best* (1927).

**FERDINAND I, KING OF BULGARIA** (1861- ). (See VOL. VIII.) After wavering for over a year, in October, 1915, Ferdinand entered the World War on the side of the Central Powers. In the crisis resulting from the entry of Serbian troops into Bulgaria in October, 1918, he abdicated in favor of his son, Boris, and retired to Coburg.

**FERDINAND, VICTOR ALBERT MAINRAD, KING OF RUMANIA** (1865-1927) (see VOL. VIII). Succeeding to the throne upon the death of his uncle, King Charles I, Oct. 11, 1914, he led his country into the World War on the side of the Allies, Aug. 26, 1916, and on Oct. 15, 1922, was crowned King of Greater Rumania established by the peace treaties. He died July 20, 1927, at Sinaia, of pneumonia aggravated by a malignant internal growth. The throne passed to his grandson, Prince Michael. See RUMANIA.

**FERGUSON, ELSIE** (1883- ). An American actress, born in New York. She made her first appearance at the Madison Square Theatre in *Liberty Belles*. She starred in *The Outcast*, *Margaret Schiller*, and *Shirley Kaye*. In 1917 she went into motion pictures in *Barbary Sheep* and later did excellent work in *Rose of the World*, *The Avalanche*, *The Witness for the Defense*, *Footlights*, and *Peter Ibbelton*. She returned to the speaking stage in 1920 in *Sacred and Profane Love* and appeared in *The Varying Shore* (1921). She again entered the moving-picture field in 1922-23; but in 1924 she played Kate Hardcastle in *She Stoops to Conquer*, in New York, and Camilla in *Carnival*.

**FERGUSON, FRANK WILLIAM** (1861-1926). An American architect, born at Portsmouth, N. H., and educated at Dartmouth College. As a member of the firm of Cram & Ferguson, he helped plan buildings at the United States Military Academy at West Point, Saint Thomas's Church in New York City, Princeton University, Richmond College, Williams College, and Rice Institute at Houston, Tex.

**FERGUSON, JOHN CALVIN** (1866- ). An American in the service of the Chinese government (see VOL. VIII). He was counselor in the Chinese Department of State in 1915-17 and became adviser to the President of the Republic of China in 1917. He was a delegate to the Disarmament Conference (1921). He has been editor of the *China Journal of Science and Art* since 1923.

**FERNALD, ROBERT HEYWOOD** (1871- ). An American engineer, born at Orono, Me. He studied at the Maine State College and at the Massachusetts Institute of Technology, Case School of Applied Science, and Columbia University. He was professor of mechanical engineering at Washington University, 1902-07, and at the Case School, 1907-12, and from 1912 to 1921 was Whitney professor of dynamical engineering at the University of Pennsylvania. After the latter date, he was director of the Department of Mechanical Engineering at that university. He was a member of many engineering societies and was the author of many reports and bulletins relating to the conservation of the fuel resources of the United States.

**FERNOW, BERNHARD EDUARD** (1851-1923). An American forester and educator (See VOL. VIII). From 1907 to 1919, he was dean of the

faculty of forestry at the University of Toronto and in the latter year he was retired as professor emeritus.

**FERRAN Y CRUA, fè'ràn e crò'o'à, JAIME** (1852-1919). A Spanish bacteriologist and sanitarian. As early as 1885, he wrote on immunization against cholera. In 1893 his work on this subject was translated into French with the title *Inoculation préventive contre le Cholera*. In 1921 Fernandez, a Spaniard, published a volume, *Woe to Great Inventors*, seeking to show that Ferran had anticipated by 30 years the methods of immunization developed by Koch and practiced successfully in the World War. Ferran was deeply interested in tuberculosis and the possibility of immunization against it.

**FERRI, fè'r'rè, ENRICO** (1856- ). An Italian criminologist (see VOL. VIII). His later works include *Il Diritto Staccionato* (1916); *L'Azione di Risarcimento dei Danni dell' Imputato Assolto contro il Denunziante* (1916); *Enrico Pessina ed il Pensiero Italiano sulla Giustizia Penale* (1917); the report of the *Commissione Reale per la Reforma della Leggi Penali* (Fr. Eng. Ger. trans., 1921); *Mussolini, uomo di stato* (1927), and *Il fascismo in Italia e l'opera di Benito Mussolini* (1927). With others, he edited *La Scuola positiva*, a monthly law review (1921- ). His *Criminal Sociology* appeared in a new English translation in 1917.

**FERRIS, DAVID LINCOLN** (1864- ). A Protestant Episcopal bishop, born at Peekskill, N. Y., and educated at the Peekskill Military Academy, the Cayuga Lake Military Academy, Hobart College (Geneva, N. Y.), and the Berkeley Divinity School (then at Middletown, Conn.). He was ordained priest in 1894, having become deacon in the year preceding. He held several pastorates from 1893 to 1920, becoming in the latter year suffragan bishop of the diocese of Western New York and in 1924 bishop coadjutor. He served on various religious boards and committees and was a trustee of Hobart College. In 1929 he became bishop on the death of Bishop Brent.

**FERRIS, WOODBRIDGE NATHAN** (1853-1928). An American educator and public official (see VOL. VIII). He was elected governor of Michigan, 1913-14 and 1915-16, and as a Democratic United States Senator for the term 1923-29. He was put forward as a Presidential candidate in the preferential primaries in his State in 1924, and was defeated by Henry Ford by a narrow margin. He received the degree of LL.D. from Olivet College, the University of Michigan, and the University of Notre Dame.

**FERTILIZERS.** The so-called natural manures, such as animal excreta, animal and vegetable refuse of the farm, peat, and the like, which were formerly the main reliance for fertilizing purposes, are so inadequate to the needs of modern intensive agriculture that they are being replaced to an increasing extent by the more concentrated and active commercial fertilizers. The use of such fertilizers has therefore grown to very large proportions and become almost universal. It is estimated that 7,600,000 tons of commercial fertilizers costing the farmer \$249,660,000 was used in the United States in 1928, and this country is far behind European countries in the per-acre consumption of fertilizers. During and immediately following the World War, the price of commercial fertilizers was prohibitively high, with the result that their use was seriously curtailed, to the

detriment of the manufacturer and the farmer. Prices are now stable at or very near pre-war levels, making allowance for increased cost of labor and freight. At the same time, the quality (plant food content) has steadily improved.

The rapid development in production of synthetic nitrogen compounds and other more concentrated forms of fertilizing materials has greatly influenced fertilizer manufacture and use. The world's need for inorganic nitrogen is now being supplied to an increasing extent by fixation of the nitrogen of the air, and, as a result of this and other advances in fertilizer manufacture, highly concentrated fertilizers, such as ammonium nitrate, ammonium phosphate, ammonium chloride, urea, and various others, are appearing on the market in considerable quantity. The use of such concentrated materials and of higher grade mixed fertilizers results in a great saving in cost of transportation and handling.

A large proportion of the fertilizer nitrogen used is derived from the Chilean nitrate deposits, and this will no doubt continue to be an important source of supply for many years to come, since the processes of working these deposits and preparing the product for the market have been so improved that the cost of production has been reduced and the working of the poorer beds made profitable. There also has been a reduction in price to the consumer to meet the growing competition of the synthetic product. The production of sulphate of ammonia, both as a by-product and as a product of the synthetic process, is increasing and is one of the chief sources of nitrogen fertilizer. Organic sources of nitrogen, such as cottonseed meal, slaughterhouse by-products, and the like, are, however, more profitably utilized for other purposes, and hence their use as fertilizer is declining. The plant begun in 1916 at Muscle Shoals, Ala., with an appropriation by Congress of \$20,000,000 and to have a capacity of 40,000 tons of fixed nitrogen per year, was expected to be an important factor in supplying nitrogen for fertilizers. It has, however, never been completed, and its future disposition remains undetermined. A recent Act of Congress, providing for completion and Government ownership and operation of the plant, failed to receive approval by the President. Meanwhile, progress is being made in production of fixed nitrogen under private auspices and initiative. The Fixed Nitrogen Laboratory of the United States Department of Agriculture has found a catalyst and made other discoveries which increase the efficiency of the fixation process, and it is believed will reduce the cost of fixation. In general, it appears that notable progress is being made in meeting the world's need for fertilizer nitrogen at reasonable cost.

The known sources of supply of phosphates suitable for fertilizer purposes are abundant and are constantly being added to by discovery and exploitation of new deposits. The known and natural deposits of phosphates in the United States alone have been estimated to be capable of yielding over 10,500,000,000 tons. The materials and methods for converting these phosphates into superphosphate and other forms suitable for fertilizer purposes also are amply provided for. Superphosphate, the form in which phosphoric acid is most commonly used as a fertilizer, prepared by treating the raw phosphates with sulphuric acid, requires a

high-grade rock phosphate and results in great wastes of the lower grades. The Bureau of Soils of the U. S. Department of Agriculture has developed a process which utilizes these lower-grade phosphates by smelting the phosphate with silica and carbon and condensing and collecting the volatilized phosphoric acid, which may be used in the preparation of highly concentrated fertilizer compounds.

Potash, the third essential constituent of fertilizers, is still largely derived from the natural deposits of potash salts in Germany and France, despite widespread effort to develop other sources. The necessities of the War led to strenuous efforts to develop a potash industry in the United States, utilizing for this purpose especially certain Western dry lake deposits, kelp, alunite, and dusts of cement works and blast furnaces, but the industry did not grow to any great proportions and declined when the supply from German and French sources again became available. Efforts in this direction, however, are being renewed, and hope of developing a domestic potash industry has been encouraged especially by results of studies by the United States Geological Survey indicating the occurrence of extensive and commercially workable deposits of potash in the Permian salt beds of western Texas and eastern New Mexico similar to those of Stassfurt and Alsace. Progress also has been made in the recovery of potash from various potash minerals and trade wastes and from alkaline lake beds. On the whole, the outlook for an adequate supply of fertilizer potash at a reasonable price is good.

The growing relative scarcity of manure has led to efforts to find an efficient substitute for it. The Rothamsted Experimental Station has reported a fair degree of success with an artificial manure consisting of a fermented mixture of straw, chalk, and ammonium sulphate, and products prepared by similar processes have been tested with encouraging results by other agencies. Attention also has been turned anew to the possibility of greater use of green manures, peat, and city refuse, to better methods of preserving manure, and to sterilization as a means of prolonging the efficient use of manure in greenhouse culture and market gardening, but perhaps the most notable development in this connection has been the demonstration of the large extent to which commercial fertilizers alone or in connection with green manures or other organic substances may efficiently replace manure.

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**FESS, SIMON D.** (1861- ). A United States Senator, born in Allen County, Ohio, who was graduated from Ohio Northern University, at Ada. He was professor of American history there (1889-96), head of the College of Law (1896-1900), and vice president of the University (1900-02). The next five years were passed as a graduate student and lecturer at the University of Chicago. From 1907 to 1917, he was president of Antioch College at Yellow Springs, Ohio. He was a delegate to the Ohio Constitutional Convention of 1912, a member of the 63d Congress (1913-15) from the Sixth Ohio District and of the 64th-67th Congresses (1915-23) from the Seventh District, and was elected to the United States Senate for the terms 1923-29 and 1929-35. In the closing session of the 70th Congress, he introduced bills for reapportionment and to permit the merging of railroad corporations. He is the author of *Outline of United States History* (1897); *American Political Theory* (1907); *Civics in Ohio* (1910); *Problems of Neutrality* (1917).

**FEUCHTWANGER, LION** (1884- ). A German writer and dramatist, born in München. He wrote the plays *Warren Hastings* (1916); *Jud Süß* (1917); *Der holländische Kaufmann* (1921); *Two Anglo-Saxon Plays* (1928), and the novels *Die Hassliche Herzogin* (1923); and *Power*. He adapted for the modern stage *Basantasena* (1915); *Der Friede* from Aristophanes (1916); and, with Bertolt Brecht, *Edward II* from Marlowe (1924).

**FÉVRIER, HENRI** (1875- ). A French dramatic composer, born in Paris. He received his musical education at the Conservatoire under Pugno, Leroux, Fauré and Massenet. His reputation rests on the success of a single work, *Monna Vanna* (Paris, 1909; Boston, 1913). In 1919 he visited the United States for the purpose of witnessing the world première of his *Gismonda* by the Chicago Opera Company. Besides these operas, he wrote *Le Roi Aveugle* (Paris, 1906) *La damnation de Blanche fleur* (Monte Carlo, 1920), *L'île désenchantée* (Paris, 1925), and the operettas *Agnès, dame galante* (1912), *La Princesse et le porcher* (1912), and *Carmosine* (1914), all produced in Paris.

**FEWKES, J (ESSE) WALTER** (1850- ). An American anthropologist (see Vol. VIII). He had contributed largely to anthropological and other magazines and was chief of the Bureau of American Ethnology, 1918-28.

**FICKE, ARTHUR DAVISON** (1883- ). An American author, born at Davenport, Iowa, and educated at Harvard and the College of Law of the University of Iowa. He taught English at the latter institution and was admitted to the bar in 1908. Among his recent works are

*Sonnets of a Portrait Painter* (1914), *The Man on the Hilltop* (1915), *Chats on Japanese Prints* (1915), *An April Elegy* (1917), *Spectra*, with Witter Bynner (1917), *Out of Silence* (1924), and *Selected Poems* (1926).

**FICTION.** See LITERATURE, ENGLISH AND AMERICAN; also BULGARIAN LITERATURE; CZECHOSLOVAK LITERATURE; FRENCH LITERATURE; GERMAN LITERATURE; HUNGARIAN LITERATURE; ITALIAN LITERATURE; POLISH LITERATURE; RUMANIAN LITERATURE; RUSSIAN LITERATURE; SCANDINAVIAN LITERATURE; SPANISH LITERATURE; JUGO-SLAV LITERATURE.

**FIELD, HAMILTON EASTER** (1873-1922). An American artist, born at Brooklyn, N. Y. He studied at the Polytechnic Institute, at Columbia and Harvard universities, and under Raphael Collin and Fautin-Latour at the École des Beaux Arts in Paris. Shortly before his death, he inaugurated the Salons of America, of which he was the first president. He was editor of *Arts and Decoration*, editor and owner of *The Arts*, the *Touchstone Magazine*, and *The American Art Student*. He was director of the Thurnscoe School of Modern Art, Ogunquit, Me., and the Ardsley School of Modern Art, Brooklyn.

**FIELD, HERBERT HAVILAND** (1868-1921). An American zoologist, born in Brooklyn, N. Y., and educated at Harvard. His published papers at Harvard were mostly on the embryology of the frog, but from 1895 he lived in Zurich (Switzerland), where he organized and administered the *Concilium Bibliographicum*, an international catalogue of scientific literature, which aims of give in card-catalogue form the title of every paper on zoology published throughout the world.

**FIELD ARTILLERY.** See ARTILLERY.

**FIELDS, JOHN CHARLES** (1863- ). A Canadian mathematician (see Vol. VIII). He became a member of the University of Toronto Senate and research professor in mathematics in 1914 and was president of the Royal Canadian Institute from 1919 to 1925. He presided over the International Mathematical Congress which met in Toronto in 1924.

**FIJI ISLANDS.** See PACIFIC OCEAN ISLANDS.

**FINANCE AND BANKING.** The subject of public finance, customarily restricted to include discussion of revenue and expenditure, also may be taken to cover the discussion of public debt; and in recent years has frequently been employed to include within its scope discussion of banking and credit as well. The term finance is here used in the latter broad sense. Finance in its public aspect includes two distinct fields of thought; the first covering the theory of taxation and of public revenue in general, as well as the theory and practice of budgetary management on the part of modern nations, the latter including survey of actual results attained as to revenue and expenditure by principal nations. In banking, discussion is usually divided into two more or less distinct fields, the first dealing with the theory and organization of banking institutions, the second with actual banking systems and results of operation.

Prior to the World War, steady and consistent effort was made by nations to maintain a distinct line of separation between public finance and banking, the principal connection between the two types of activity being afforded by the

operation of central banks in the different countries. During the War, public revenues were in no small degree obtained through banking methods, with corresponding effects upon prices, while governments practically took possession of banking systems with a view to controlling supplies of credit, issues of currency and rates of interest. The result has been that, since the close of the War, a very intimate connection has continued to exist between public finance and banking in actual practice, while levels of prices and other aspects of the general economic situation have felt the effects of financial and banking policies compositely, rather than independently. Therefore, much discussion of public finance and of banking is today carried on jointly, while the bulk of the consideration of public finance implies specified conditions as to banking; and, conversely, statements of theory and practice in banking are based upon specified assumptions made as to financial conditions.

**Relation of Finance and Banking.** Banking is the phase of economic organization, or the economic institution, by means of which the credit function is exercised and through which actual wealth is made available as a means of exchange. Public finance is the science or method whereby governments obtain the resources they need and apply them to designated objects. Evidently, where governments become large operators of industry, large owners of wealth, or large consumers, they come to occupy a very important relationship to banking, inasmuch as they require extensive banking services and must rely largely on banks for the collection and payment of funds as well as for the transfer of wealth from individuals to the government and vice versa, and for the advancement of private resources for government use pending the time when the government has collected from taxpayers wealth in sufficient quantity to meet its requirements. Moreover, the increasing use of paper currency and the hazards involved in leaving its issue unrestrictedly in the hands of the banks have led to the establishment of an intimate relationship between the government and the banking mechanism with respect to the control of the circulating medium. At the same time, the creation and retirement of such medium, coupled with the variations in the volume of bank credit in other forms, have exerted a direct influence on prices, and hence on the volume of taxation required to furnish means for the government's needs as respects the purchase of commodities and services.

**Expenditure of Principal Countries.** It is worth while to take careful account also of the

expenditure of the principal Continental countries, not only because of the inferences that may be drawn from such comparisons as to the causes of growth of public outlay in the different countries but also because of the light that is thereby thrown upon the burdens to which the public of the several nations have been subjected. The accompanying table furnishes the data necessary for such a comparison during the war and the post-war period.

**Trend of Finance 1914-29.** The war and post-war period included in the years 1914-29 is too recent to permit positive judgment with respect to consequent effects upon methods or currents in public finance. It will require a much longer lapse of time to reach definite conclusions as to the probable outcome of the factors which had been set at work as a result of the War; yet, there are outstanding facts which are deserving of special notice from a descriptive standpoint and which supply the basis for inferences with regard to the probable trend to be followed in the future. Generally speaking, the outstanding feature of the period is found in the enormous growth of public expenditure which has carried the outlays of substantially all modern governments, whether belligerent or neutral, up to figures that before the War would have been considered purely imaginative. This enormous growth of public expenditures was, in the belligerent countries, the natural result of warfare and its costs, but in the neutral countries was only partly brought about as the indirect result of these factors. Many of the smaller countries, especially those bordering on the scene of action, found it necessary to mobilize their armies and to keep large bodies of men ready for defense should such a step become necessary. Yet this alone was not a sufficient influence to bring about the tremendous growth of outlay. Added to it was the fact that the enormous inflation of credit and currency in the belligerent countries was reflected in the neutral states, while the world demand for commodities itself tended to raise prices everywhere; the outcome being a great advance in the price level of which the net result was to necessitate corresponding increases in the amounts of revenue raised for the public service as expressed in terms of money. This state of things, it should be remembered, came into existence at a time when there was already a general drift toward higher levels of expense, which had already made itself apparent not only with respect to absolute amounts but also in proportion to population. The movement, viewed in the aggregate, may be illustrated by the experience of the United States, which was at first a neutral and later a belligerent, its

NATIONAL EXPENDITURE  
(000,000 omitted)

Countries	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1928
United States *	\$ 700	781	723	1,977	12,697	18,515	6,141	5,166	8,872	3,294	8,621
Australia	\$ 23.1	38.1	65.2	87.5	....	111.4	....	92.6	77.9	62.3	....
United Kingdom	£ 197.5	560.4	1,559.1	2,198.1	2,696.2	2,579.3	1,195	1,079	1,079	910	898
Germany	marks 8,654	25,708	27,723	49,098	58,860	45,573	54,887	135,315	800,399	352,291	10,010
France	francs 6,589	22,804	29,536	36,345	39,419	49,793	29,822	23,262	24,687	23,402	41,527
Russia	rubles 2,927	2,898	8,647	4,078	46,706	215,402	1,215	26,076	922	1,418	5,915
Italy	lire 8,129	5,954	12,711	17,146	25,829	28,171	37,689	21,759	20,618	20,618	21,131
Austria											
Hungary	kronen 5,210	6,048	....	....	25,612	....	....	258,229	347,533	....	15,954
Japan	yen 574	648	588	602	714	1,808	1,896	1,584	1,482	1,850	1,758
Canada	\$ 127	197	296	456	522	712	1,064	375	845	824	854

\* Fiscal year.    † 1913.

Federal expenditure, both absolutely and per capita, moving as indicated below in the table:

AMERICAN FEDERAL EXPENDITURE (ordinary)		
Year	Total (000,000 omitted)	Per Capita
1900	\$520.8	\$6.84
1910	\$593.6	7.52
1915	760.5	7.66
1920	6,482.1	60.91
1923	3,697.5	33.10
1924	2,946.4	30.83
1925	2,464.1	30.59
1926	3,030.3	30.61
1927	2,897.1	29.45
1928	2,897.1	30.36

This showing is clearly paralleled in the fact that Great Britain, whose conditions are perhaps closer to those of the United States than are those of any other country, has seen her national expenditure rise from £2.31 per capita in 1890 to £3.52 in 1900, followed by a very moderate decline to £3.50 in 1910 and an increase to £22.7 in 1921 then followed by a post-war decline due to economies which, however, carried the figure only to about £19.5 in 1928.

penditures during and after the War greatly exaggerated this tendency toward the growth of military outlay, while at the same time it naturally enlarged the proportion of expenditure going to public debt, due to the fact that the War was necessarily (as will be seen later) so extensively financed upon a borrowing basis. While some progress was made after the close of the War, diminishing the amounts directly spent for army and navy, and while the treaties which grew out of the Washington Naval Conference of 1924 had a palliating effect, rebirth of international suspicion occurred after 1925, and very large naval programmes were put forward both in Europe and in the United States. It was still true in 1928, if the public debt be primarily regarded as a legacy of post-war outlays, that the total amount payable for military and naval reasons far exceeded any other category and was probably on the increase. The accompanying table reviews the development of American Federal government outlays at intervals from 1870 down to the situation during the fiscal year ending in 1928. Whether expendi-

## UNITED STATES EXPENDITURE IN MILLIONS OF DOLLARS

Year	Civil and miscellaneous *	War	Navy	Indians	Pensions	Interest on the Public Debt	Total
1870	\$64.3	\$57.6	\$21.7	\$3.4	\$28.3	\$129.2	\$309.6
1875	63.8	41.1	21.4	8.3	29.4	103.0	274.6
1880	54.4	38.1	18.5	5.9	56.7	95.7	267.6
1885	82.9	42.6	16.0	6.5	56.1	51.3	260.2
1890	94.8	44.5	32.0	6.7	106.9	36.0	318.0
1895	82.2	51.8	28.7	9.9	141.3	30.9	356.1
1900	131.6	134.7	55.9	10.1	140.8	40.1	520.8
1905	127.9	126.1	117.5	14.2	141.7	24.5	567.2
1910	171.5	169.8	123.1	18.5	160.6	21.3	693.6
1912	172.2	184.1	135.5	20.1	153.5	22.6	689.8
1920	3,133.1	1,100.9	629.9	40.5	213.3	1,024.0	6,141.7
1923	1,169.5	355.7	322.5	45.1	264.1	1,055.0	3,244.7
1924	1,047.2	343.6	324.1	46.7	228.2	938.7	2,946.4
1925	617.5	357.9	326.3	38.7	213.3	882.0	2,464.1
1926	1,233.8	358.3	311.6	48.4	207.1	831.4	3,030.3
1927	1,180.1	361.9	322.6	36.7	230.5	787.7	2,897.1
1928	1,128.8	400.3	337.6	36.9	229.4	781.8	2,897.1

\* Exclusive of postal deficiencies.

**Classification of Expenditure.** Almost as important as the gross amount of expenditure, is its classification as between different purposes. Before the War, there was everywhere a substantial growth toward an undue outlay for military and naval expenditure, which gave rise to much of the demand for a means of obtaining international agreements for the maintenance of peace. The drift of public ex-

penditure has proceeded more rapidly than the growth of wealth in recent decades is another point as to which statistics are very much less positive. It would seem in the main that prior to the War, wealth was increasing slightly faster than expenditures. War experience makes the question far more debatable.

**Comparative Revenues.** While there is much advantage to be derived from careful com-

NATIONAL (GOVERNMENTAL) INCOME  
(000,000 omitted)

Countries	1914	1915	1916	1917	1918	1919
United States	\$ 735	698	780	1,117	3,665	5,152
Australia	£ 21.7	22.4	30.8	34.1	36.8	44.7
United Kingdom	£ 198.2	226.7	336.8	573.4	707.2	889
Germany	marks 2,850.83	3,400	3,320	4,340	7,332	9,200
France	francs 1,239	4,113	4,641	5,811	6,987	11,200
Russia	rubles . . .	2,873	3,647	3,999	16,583	48,959
Italy	lire 2,262	2,155	2,702	3,722	5,645	22,080
Austria-Hungary	kronen 5,210 *	5,724.8	...	8,663	...	...
Japan	yen 549	509	518	233	714	722
Canada	\$ 163	133	127	595	261	310

Countries	1920	1921	1922	1923	1928
United States	\$ 6,695	5,625	4,109	4,007	4,075
Australia	£ 52.8	65.5	64.9	59.5	...
United Kingdom	£ 1,339.6	1,425.9	1,124.9	914	842.8
Germany	marks 53,000	149,600	1,091,600	5,640,900	10,010
France	francs 21,170	2,380.2	28,381	19,285	42,160
Russia	rubles 159,604	4,139,900	368	1,056	5,915
Italy	lire 37,251	23,052	...	26,108	21,200
Austria-Hungary	kronen . . .	93,325	209,768	...	16,810
Japan	yen 1,896	1,584	1,482	1,350	1,758.9
Canada	\$ 400	440	380	396.8	398.6

\* 1918. <sup>b</sup> Estimated. <sup>c</sup> Gold rubles for 9 months. <sup>d</sup> Gold rubles.

parison of the revenues of different countries, the same difficulty inheres in any such comparison that has been noted in connection with expenditures. Nevertheless, it is possible to afford a rough general comparison of outlays particularly for recent years, war necessities and negotiations having compelled a closer basis of analysis for the purpose of reducing national expenditures and receipts to somewhat the same footing in one country as in others. The figures in the accompanying table furnish comparative data designed to contrast revenue and expenditure conditions in the several countries.

**Local Versus National Finance.** In the United States, particularly, great interest has always attached to the distribution of taxation and expenditure between the Federal and local governments. This is due to the fact that, under our peculiar system of State and local government, there has been considerable jealousy between the different grades of administration, as well as more or less conflict in their taxing policy. The War and the developments after it materially affected this relative situation while they widely altered the relationship existing between the amount of Federal and local expenditure and income. In 1904 the U. S. Census Bureau, in a first report on the subject, showed that local expenditures were 61.8 per cent of all governmental outlays in the United States. Similar inquiries in Great Britain showed local expenditures for 1910 as 55 per cent. While the increase of local expenditure, not only here but in England and in other countries, has gone on rapidly, measured in absolute figures, being augmented by special causes which are perhaps not permanent in their nature, the relative proportion of local outlay has been reduced, due to the fact that national or Federal expenditures have been so vastly enlarged. For 1927-28 Great Britain's local expenditures were less than 17 per cent of her national total, while those of the States and larger cities in the United States, in 1928, were 46 per cent of the total.

**Local Revenues.** Local revenues in the United States have been studied by the Census Bureau, which furnishes the following figures:

# REVENUES FOR CITIES (146) OF OVER 30,000 POPULATION

Year	NET REVENUE RECEIPTS	
	Amount (000 omitted)	Per capita
1927	\$2,568,749	\$69.77
1926	2,391,607	66.14
1924	2,038,512	58.41
1922	1,801,302	53.57
1919	1,103,666	35.26
1917	968,445	31.97
1915	865,271	30.00
1905	498,837	22.79

**Sources of Public Revenue.** The theoretical classification of public revenues employed by most writers on public finance, omitting minor or casual sources of income such as fines and gifts, includes: (1) Prices.—By this term is meant the revenue arising from the sale of public property such as land and its products, usually a small proportion of the income of well developed states. (2) Charges.—By this term is meant the sums exacted for the particular services, largely industrial, rendered by the state, including post office, telegraph, telephone, railroad, gas and electric light, and sale of manufactured products. (3) Fees.—By this term is meant the sums exacted for services rendered by public authorities in the course of administration of business. Included are court fees, licenses, and the like. They are charged upon the theory that they represent the return for a special service which is not enjoyed by the entire body of the community. Special assessments are grouped under the head of fees by most writers. (4) Taxes.—By taxes are meant sums levied upon the citizen as a contribution to the general welfare or for the support for the government in the performance of functions which are so broadly applicable to all citizens that they cannot be apportioned or assigned, while their cost is so great that they must be paid for on a common basis regardless, in some measure, of specific advantage to the individual. The characteristic of the period 1914-28 has been the great growth of the latter revenue source.

## REVENUES FOR STATES (48)

### COMPARISON OF TOTAL AND PER CAPITA REVENUES

Year	All revenues		From taxes		All other revenues	
	Total (000 omitted)	Per capita	Total (000 omitted)	Per capita	Total (000 omitted)	Per capita
1927	\$1,758,381	\$14.99	\$1,355,127	\$11.55	\$403,254	\$8.44
1926	1,655,495	14.29	1,264,285	10.91	391,210	8.37
1924	1,370,066	12.32	1,017,460	9.14	352,606	8.18
1922	1,159,527	10.71	858,145	7.82	301,382	2.78
1919	675,217	6.43	527,819	5.02	147,398	1.41
1917	522,925	5.14	409,965	4.02	113,060	1.12
1915	458,233	4.66	365,544	3.71	92,689	0.95

Revenue Receipts were classified as follows:

## REVENUE RECEIPTS; 1927

	For States			For Cities		
	Total (000 omitted)	Per capita	Per cent distribu- tion	Total (000 omitted)	Per capita	Per cent distribu- tion
All revenues	\$1,758,381 <sup>a</sup>	\$14.99	100.0	\$2,945,512	\$68.96	100.0
General property taxes	370,435	3.16	21.1	1,888,704	44.21	64.1
Special property and other special taxes	801,943	2.57	17.2	64,458	1.51	2.2
Poll taxes	3,425	0.03	0.2	5,238	0.12	0.2
Licenses	679,324	5.79	38.6	88,941	2.08	3.0
Special assessments	27,078	0.23	1.5	233,293	5.46	7.9
Fines, forfeits, and escheats	7,912	0.07	0.4	18,733	0.44	0.6
Subventions and donations	138,789	1.18	7.9	144,292	3.38	4.9
Interest, rents, and highway privileges	81,922	0.70	4.7	136,455	3.19	4.6
Earnings of general departments	134,881	1.15	7.7	74,456	1.74	2.5
Earnings of public-service enterprises	12,692	0.11	0.7	290,942	6.81	9.9

<sup>a</sup> Includes revenues collected by the States and apportioned to the minor civil divisions for educational and other purposes.

**American Revenues.** The following figures furnish a brief survey of principal sources of revenue in the United States since 1900:

**TOTAL ORDINARY RECEIPTS OF THE UNITED STATES IN MILLIONS OF DOLLARS**

Year	Total	Customs	Int. Rev.	Income and Profits tax
1840	\$19.5	\$13.5	.....	.....
1845	30.0	27.5	.....	.....
1850	43.6	39.7	.....	.....
1855	65.3	53.0	.....	.....
1860	56.1	33.2	.....	.....
1865	339.7	84.9	\$209.5	.....
1870	411.2	194.5	184.9	.....
1875	283.0	157.2	110.0	.....
1880	323.5	186.5	124.0	.....
1885	323.7	181.5	112.5	.....
1900	567.2	233.2	295.3	.....
1905	544.2	261.7	234.0	.....
1910	675.5	333.6	268.9	.....
1912	692.6	311.3	293.0	.....
1920	6,704.4	323.5	1,442.2	3,956.9
1923	3,847.0	502.1	935.6	1,691.0
1924	3,884.0	545.0	952.5	1,841.7
1925	3,607.6	548.5	827.7	1,761.6
1926	3,908.4	579.7	862.6	1,974.1
1927	4,023.7	605.6	848.7	2,219.9
1928	3,863.9	568.1	617.6	2,174.5

**Reliance on Direct Taxation.** Pre-war finance in many countries relied largely on indirect taxation. In the United States, the Federal government was collecting in normal years the great bulk of its income from customs duties and internal revenue charges. During the early war years, a small income from direct taxation also was obtained. Great Britain had long had the income tax in effect and it was producing substantially at the opening of the War. Nevertheless, Great Britain also relied largely on indirect taxes and the same was true of most countries. The war necessities changed all this and hostilities greatly increased the total burden of taxation and made it absolutely necessary, in order to get the required funds, to rely largely on the proceeds of direct levies. Not only, therefore, was the total burden of taxation very greatly added to, but also the amount paid to governments as direct deductions from income not dependent upon purchase or the performance of specified acts was greatly enlarged. The effect of this change in method of taxation was undoubtedly to make the burden of the tax loads very much more obvious, and to make it seem more serious than would have been true had it been collected entirely through indirect sources. Efforts to reduce budgets after the close of the War did not prove very successful and it was found in almost all cases that indirect taxation had been carried practically to the extreme of its productivity, while the income and excess profits taxes in those countries which depended upon these sources of income predominantly, had been raised to a point which was interfering with the growth of wealth. This latter consideration seemed to be of peculiar force in Great Britain and in the United States where during the early post-war years there was an obvious decline in the amount of saving due to the fact that taxpayers of large income really engaged in business found it a matter of relative indifference whether to increase their business expenses to a point which consumed what might otherwise have been additional net income or to pay the latter in large part of the Government. With rates on incomes running as high as 60 to 70 per cent, the inducement to saving beyond a

specified limit was not strong. Hence, most post-war fiscal policies which aimed at budgetary economy sought to bring about such economy by a reduction in the burden of direct taxation. One outgrowth of this movement was the adoption in November, 1921, of the Income Tax Revision Law in the United States which eliminated the excess-profits tax, while in Great Britain the budget estimates for the year beginning Apr. 1, 1922, abandoned the idea of further debt reduction during the year in question, excess-profits taxes having already been repealed in 1921.

The post-war taxation on the Continent of Europe naturally followed a somewhat different course because of the fact that during the War so great a reluctance to further tax increases had been made manifest. The necessities of such countries as France, Germany, and Italy after the War naturally dictated the imposition of new, rather than the withdrawal of old, taxes because of the necessity of providing means which would carry the very heavy interest charges resulting from the borrowing policies of the War.

Post-war finance, both in the United States and in Europe, has had three principal objects—the reduction or abolition of the enormous taxation of the war period, the funding and consolidation of the debts created during the War, and the reduction of government expenditures. Coincident with these it was necessary to find a means of insuring the restoration of banking systems to a sound condition, as well as to provide for the placing of foreign exchange rates upon a more stable basis, and at the same time to take measures so that the international flow of trade and of investments should be correspondingly facilitated. One principal obstacle to success in these undertakings has been the tangle of indebtedness existing between the various countries. Such indebtedness represented the aid extended by one country to another during the War, but it was early perceived that in the last analysis there was but one great creditor, the United States, and one great debtor, Germany. It was recognized accordingly that the key to the restoration of a sound system of post-war finance was probably to be found in the introduction of a satisfactory system of reparation payments which should enable the Allied belligerents to collect from Germany enough to enable them to offset the bulk of the losses to which they had been subjected and at the same time to settle with their external creditors. The Treaty of Versailles had made no definite disposition of these questions, leaving final settlement to the so-called Reparation Commission, which in March, 1920, announced a scheme of reparation payments whereby Germany's total obligation was fixed at 135,000,000,000 marks (pre-war gold value). Elaborate details concerning the payment of this sum were provided and the bulk of the cash proceeds was assigned to France, Belgium, and Italy. The Germans, however, failed to pay more than approximately enough to cover the cost of holding the occupied German territory which had been taken by the Allies as security for the liquidation of their claims.

Accordingly, France and, in a much lesser degree, some of the other countries that relied on the collection of German indemnities as a means of meeting their budget requirements were unable to obtain the funds necessary to settle the budget obligations they incurred in the belief



that they would be able to transfer the cost to the Germans. Hence, their budgets failed to balance and such reductions in taxation as occurred simply cut away the fundamental basis upon which a restoration of soundness would necessarily rest.

Great Britain, which did not rely on any considerable receipts from Germany, was able gradually to restore her exporting power, despite some serious industrial obstacles such as the coal strike of 1921. Accordingly, in 1924 new reparations conferences were begun and the so-called "Dawes plan" was the result. Payments under the Dawes plan were to increase to a standard payment for 1929 amounting to \$5,931,000,000 and the capitalized value of the actual payments was estimated at 50,000,000,000 marks. In case Germany should prove unable to transfer the funds owing to lack of exchange, they were to be accumulated in German banks.

This plan was carried out until 1929, when new negotiations were begun. The pressure for reduction of the terrible tax load was severe in all countries and has resulted in a good many revisions and some alleviation, but the only countries in which material reduction was secured have been Great Britain and the United States. In the latter, demand for reduction became formidable soon after the War. The Republican Party, elected in the autumn of 1920, largely on a platform of tax reform, adopted in October, 1921, a so-called tax-revision measure which, however, cut the burden of taxation but slightly, although technically repealing the excess-profits tax. Later revisions culminating in the Income Tax Law of 1928 still further reduced the burden, but it everywhere remained far in excess of previous taxes. Great Britain likewise did away with the excess-profits tax and similar action was taken in other countries. Nevertheless, in all the problems of rebalancing, the budget was seen to rest more and more upon the restoration of sound banking conditions.

Progress toward sound budgetary conditions was greatest in the United States and in England during 1920 and 1921. In the United States, ordinary receipts up to November 12, for the fiscal year beginning July 1, 1921, exceeded ordinary disbursements by about \$155,000,000. The British budgetary recovery was slower, showing deficits in 1920-21, but continuing steady improvement up to 1928 when expenditures had been reduced to £838,000,000 with revenues of £842,000,000.

In most of the Continental countries, the budget situation for some time after the War showed no real improvement; but recovery gradually set in and has now become fairly well confirmed in the major states. Budgetary figures for Italy for the fiscal year 1928-29 showed revenue of 17,643,000,000 lire against outlay of 17,372,000,000 lire. The French government contemplated revenues for 1928 amounting to 42,160,682,000, contrasted with outlays of 41,527,952,000 francs. Of the ordinary receipts, 38,500,000,000 francs were expected from indirect taxes and monopolies. At the opening of 1927, the total public debt of France was 300,000,000,000 francs, internal, and 220,000,000,000 francs, external. This figure does not include loans floated by the cities and industries in the devastated regions, although the Government is responsible for their interest and repayment. In the case of Germany, government expenditures for 1928 were estimated at 10,610,000,000 Reichs-

marks. The funded debt at the opening of 1928 was 8,000,000,000 Reichsmarks.

There has been a prevailing belief for a long time past that the principal element in the existing fiscal difficulties of many countries is to be found in their great outlay for war. This statement is true in broad terms, but requires to be qualified and limited in its application. In some countries, such as the United States, the outlay for war, while a very large part of the total outlay, is in large measure an expense which serves to carry the cost of past wars in the form of interest on public debt. While naval and military expenditure is large in such countries, it is a relatively moderate part of the entire budget. In other countries, as in France, the current cost of military support still constitutes a very important fraction of the budgetary outgo. It has, therefore, been thought worth while to compile statements designed to show the comparative situation of the budget in several of the principal countries, with a view to ascertaining approximately how each stands in this matter of expenditure for national defense, especially as compared with pre-war years.

Compared with 1913, the last pre-war year, the amounts of money expended for national defense by the governments of France, Italy, and Germany show enormous expansion, but it should be remembered that the purchasing power of the currencies of these countries has undergone varying degrees of depreciation and that the larger amounts for the more recent years, when reduced to 1913 monetary equivalents, will not show the same degree of expansion as is indicated in the table. During the war years, the proportion of the total expenditures made directly for war was in excess of 80 per cent in all three of these countries. In 1928 the proportion had declined to 25 per cent in Germany, to 22 per cent in France, and to less than 17 per cent in Italy; in Great Britain and the United States, the proportion for the fiscal year 1928 was 21 and 14 per cent, respectively. Nevertheless, the financial burden upon taxpayers in these countries due to military expenditures was much heavier than before the War.

The accompanying table exhibits the post-war burden of taxation in some of the chief countries of the world:

#### PER-CAPITA TAXATION

United States .....	\$70.96 *
United Kingdom .....	70.95 *
Australia .....	45.36 †
Canada .....	38.50 †
Germany .....	31.30 †
France .....	39.41 †
Italy .....	25.00 ‡
Japan .....	10.62 *

\* On basis of 1927.

† On basis of 1926-27.

‡ On basis of 1928.

The question whether some adjustment or alleviation of this tremendous burden can be devised has occupied the attention of statesmen since the close of the War, but has confirmed most in the belief that heavy direct taxes will continue the chief reliance of most countries for a long time to come.

**Government Activity in Business.** The participation of the government in business, which before the War had produced a very considerable element in the revenue system of some countries (e.g., France, Germany, Austria, and others), received a substantial extension in

consequence of the War and of necessities attendant thereon, but the success obtained has been so slender as to produce a reaction of opinion among those who in former years regarded public activity of this kind as a probable source of future increase in revenue yield. Railroad operation, which was undertaken on an extensive scale both by Great Britain and the United States, proved an actual source of loss and was discontinued in both countries. The operation of ocean-going ships was equally disappointing and state manufacture of various kinds of commodities turned out even more unsuccessfully than during pre-war years. Instead of assuming an increasingly important position in budgets, revenue derived from industrial and business occupations has not only come to form a smaller and smaller proportion of total income; but, as just stated, it has been obtained under circumstances of such difficulty as to make it clear that it must be regarded as an inadequate reliance for the future.

tive purposes. The tariff of the United States adopted in 1922 (Fordney-McCumber Act) with subsequent administrative changes of duty made by the President under the so-called "flexible tariff" sections, has been unexpectedly large in its yield, the annual income amounting to as high as \$600,000,000. In 1929 a further revision of the tariff was undertaken and the Hawley Bill was prepared in the House of Representatives. European tariffs have been steadily raised, partly under the influence of need for more revenue, partly as a result of nationalistic aspirations. So extravagant did rates seem in 1926 that an international group of business men combined to issue a joint letter of protest against the tendency. The drift toward higher rates has, nevertheless, continued.

One feature of the tax system of the War was the great extension of internal revenue duties, especially taxes on articles of luxurious consumption. These taxes proved so unpopular that the greater share of them was abolished.

#### REVENUES AND EXPENDITURES OF EUROPEAN NATIONS, 1904-1928:

##### GREAT BRITAIN (In thousands of pounds sterling)

	(a) Revenues	(b) Expenditures	(c) Public debt charges	Per cent (c) to (b)	(d) Expenditures for national defense	Per cent (d) to (b)
1904-05	143,370	141,956	27,000	19.8	66,055	48.5
1912-13	165,778	165,598	24,500	14.8	72,436	43.7
1916-17	573,427	2,198,113	127,250	5.9	1,802,603	84.0
1918-19	842,050	2,579,301	269,965	10.6	1,701,545	70.0
1920-21	1,425,984	1,195,427	349,599	30.5	292,288	25.5
1921-22	1,160,521	1,079,186	332,300	30.0	189,300	18.4
1927-28	796,850	818,390	355,000	43.4	114,000	13.9

##### FRANCE (In thousands of francs)

1905	3,766,346	706,835	1,205,124	34.9	1,143,820	33.1
1913	5,091,744	5,066,931	1,284,079	27.2	2,070,530	43.9
1917	5,575,845	41,679,600 *	4,863,686	11.7	34,065,809	81.7
1919	11,800,000	793,884 *	7,986,823	16.3	35,811,390	73.0
1920	21,770,243	29,882,700	11,833,174	22.7	26,432,545	91.7
1921	28,802,584	23,262,969	13,820,000	57.4	5,027,000	28.0
1922	28,981,834	24,687,958	13,820,000	54.1	4,539,000	18.4
1928	42,160,682	41,527,952	14,580,000	35	8,762,000	21.1

##### ITALY (In thousands of lire)

1905	1,950,620	1,902,822	574,017	37.6	419,200	22.6
1913	2,885,130	3,289,010	598,220	18.2	1,666,660	50.7
1917	5,170,430	16,971,000	1,348,119	7.2	14,810,680	84.3
1919	22,080,185	32,150,100	2,705,200	8.4	26,974,420	83.9
1920	37,251,018	28,171,296	8,543,024	12.6	.....	.....
1921	28,052,058	37,688,951	3,712,790	10.9	5,026,038	13.4
1922	17,497,130	21,759,255	3,708,272	12.2	3,450,000	15.8
1927-28	21,200,142	21,130,946	.....	...	3,392,000	11.3

##### GERMANY (In thousands of marks)

1905	2,215,232	2,208,887	127,556	8.6	1,052,288	48.3
1913	1,957,380	2,024,528	231,176	11.4	1,582,290	78.2
1917	2,122,304	27,821,047	2,616,798	9.4	24,920,907	89.6
1919	31,689,709	45,513,371	5,914,204	12.6	40,179,143	85.5
1920	16,907,025	54,867,028	8,922,692	14.5	37,033,568	60.2
1921	135,315,768	135,815,768	12,695,316	9.1	3,007,812	1.1
1922	350,099,885	300,999,385	16,121,472	5.3	3,658,896	1.2
1927-28	10,010,200	10,010,200	1,976,900	19.7	1,673,000	16.7

\* total expenditures

**Tariffs and Internal Revenue.** Highest productiveness was believed by some to have been reached in the tariff system of the United States prior to the War, with a revenue of about \$350,000,000 as a maximum. In Europe, the productiveness of tariff duties had declined as rates increased. During the War, tariff systems fell into disorder and yielded far less than normal returns, owing to the interruption of international trade or its distortion as a result of war demands. After the War, a new era of tariff taxation set in, based upon the nationalistic spirit and essentially intended for protec-

The United States eliminated a large portion of its consumption taxes from and after Jan. 1, 1922. In all countries, taxes on tobacco and liquors continued very heavy with increasing returns. In the United States, however, the adoption of the prohibition system largely eliminated the regular yield of the liquor taxes.

**State and Local Taxation.** As a result of war demands, local expenses, as well as national, greatly increased. Such increase in expenditure was met chiefly through an advance in the rate levied upon already existing objects of taxa-

tion. In the United States, however, State income and inheritance taxes were given a very considerable development, while in some cases surtaxes were added. Real-estate taxation became much heavier both in the United States and in Europe. Public debts were largely added to among local governments and the tendency to increase in that direction was furthered by bonus distributions to ex-service men, the borrowing for this purpose being rendered easier through exemption of bonds from taxation.

**Budget of the United States.** In all countries, the importance of budgetary control was emphasized as a means of economy. An effort to introduce a budget system into the financial organization of the United States was made early in the administration of President Harding, being recommended in a message to Congress on Dec. 5, 1921. This was the result of about 12 years of discussion beginning during the administration of President Taft. On June 10, 1921, Congress approved a law providing for a national budget system and a bureau of the budget. Appropriations in Congress, however, continued in the hands of the numerous Congressional committees vested with the power of appropriation and resulted in preventing the development of a genuine budget system analogous to that of European countries. In fact, on various occasions, Congress disregarded the budget estimates and appropriated money according to its own inclination. On the other hand, savings which were nominally introduced as a result of the budget system turned out to be illusory in some cases, owing to the fact that they were merely due to curtailments of allowances for upkeep which eventually had to be restored although temporarily interrupted.

**Changes in Public Debt.** It follows closely from what has been said with respect to public finance that the period 1914-29 was notable in its relation to the public debt. Like the growth in public revenue and expenditure, the growth in debt was practically universal in all countries, although not proceeding in the same proportion in all; but in the main, the experience may be described as a universal advance in world indebtedness. The outstanding facts in the situation as affecting the principal countries are reviewed in the accompanying table.

Taxation in France followed a course rather different from that pursued in the United States. The first new impositions adopted in 1914 were made effective in 1916 and applied to incomes in excess of \$1000 with excess-profits rates running up to 50 per cent. On July 1, 1916, a special war levy was made on all citizens who had not actually served with the troops, and fees and stamp dues, as well as taxes on investments were generally raised. In 1917 and 1918 extensive luxury taxes were introduced. After the War, continuous legislation on taxation was proposed but the situation was never taken in hand very vigorously until early in 1924 when the absolute necessity of equalizing the budget became evident. At that time, general revisions occurred, the actual burden of taxation being greatly increased not merely by legislation but also by more thorough and inclusive administration and real collection.

Germany, in the belief that the War would be short, attempted to do without new taxation, but in 1915 provided for a substantial increase, applicable largely in the several German states. The Imperial government in 1916 imposed war-profits taxes, excess-profits taxes, and others, be-

#### DEBTS OF PRINCIPAL NATIONS, AND AGGREGATE FOR ALL NATIONS OF THE WORLD AT VARIOUS DATES

(In millions of dollars)

Dates	Austria	Belgium	France	Germany	Italy	Nether-lands	Russia	United Kingdom	United States	World
1913	3,799	825	6,300	1,200	2,852	462	4,500	3,500	1,198	42,940
1918	15,807	1,902	32,322	39,200	11,900	652	24,564	28,600	12,248	205,896
1919	28,584	1,888	42,700	48,552	15,009	981	24,564	37,221	25,482	295,070
1921	15,800	4,900	55,000	80,000	21,200	1,046	24,564	37,000	24,297	382,684*
1922	.....	6,708	65,921	1,984,475	22,816	.....	24,564	38,009	23,976	.....
1928	343,933*	1,730	18,950	1,886	4,629 <sup>b</sup>	1,186	4,764	38,997	18,510	.....

\* World debts have changed so greatly through repudiation, devaluation, etc., and are so much confused through differences of treatment between foreign and domestic debts that a comparable basis no longer exists. Many debts moreover, are still in process of readjustment.

<sup>b</sup> Does not include the annuities coming from \$5,000,000 in 1925-26 to \$36,195,000 in 1956-57 payable by Italy to the United States in displacement of a war debt of \$1,600,000,000.

\* End of 1927.

\* End of 1926.

#### EXTERNAL AND INTERNAL DEBT\*

Approximate value in millions of dollars—conversion at par

	External	Internal	Total	Pre-war wealth	Ratio of debt to national wealth on pre-war basis
United States	.....	\$18,510	\$18,510 <sup>b</sup>	\$204,400	99
United Kingdom	\$5,861	31,822	37,193	70,500	52
Australia	552	1,776	2,328	8,800	27
Canada	243	2,088	2,281	14,650	15
Germany	226 <sup>c</sup>	1,770	1,996	80,500	2.4 <sup>f</sup>
France	7,150	11,800	18,950	57,900	32.8
Russia	4,160 <sup>d</sup>	3,604	4,764	58,400	8
Italy	98 <sup>e</sup>	4,332	4,629	21,800	21
Japan	730	1,784	2,514	11,200	22

\* Debts for which figures are given vary somewhat but are approximately representative of conditions at some date in 1927.

<sup>b</sup> June 30, 1928.

<sup>c</sup> For Germany's real external debt, see terms of the reparations. The figure given is merely the so-called "Dawes loan."

<sup>d</sup> Still disputed and indebted.

<sup>e</sup> Does not include Italy's annual payments to the United States.

<sup>f</sup> Does not include reparations.

sides taxes on transactions and various objects of consumption. In 1918 internal revenue duties were extended and the rates on war profits were made heavier. After the War, and finally as a result of the ultimate reparations negotiations, a new and far heavier system of taxes was installed. A similar policy of waiting prevailed in Austria, although as the War progressed advances were made from time to time. After the close of the struggle, a complete financial reorganization occurred, but the resources of the nation had been so greatly reduced that its revenues from taxation were scanty notwithstanding heavy per-capita charges.

Italy, on the other hand, recognized the necessity of heavier taxation practically from the beginning of the War, but was not very successful until the struggle was nearly over. In 1918 there were great extensions of luxury and consumption taxes and in 1919 a supplementary income tax. These were followed by extensions and changes under the Fascist regime which brought the average burden to a high level in 1928. In the minor European countries, no general or uniform policy was pursued, some increasing the revenues through taxation while others relied largely on loans and indirect taxes.

In the United States, as a result of continuous agitation, the administration of President Coolidge obtained from Congress at the session of 1923-24 the adoption of a more thorough plan of tax revision than that adopted in October, 1921, basing the demand upon the presence of an expected surplus in the budget for the fiscal year 1925. This was followed by other minor reductions and rearrangements, the latest in 1928.

Among the minor European countries budgetary progress was slow, while in Germany the unsettlement with regard to reparations and the unsatisfactory industrial conditions resulted in continuous deficits.

As already incidentally noted, this growth in indebtedness is to be ascribed in part to actual military expenditure, in part to the protection of neutral frontiers, and in part to the advance of prices and wages. Which one of these factors was predominant in any given country, is possibly a matter of secondary interest. The significant facts relating to the debt situation are, first of all, the actual growth of indebtedness as just surveyed, and secondly the methods by which the debt position at the end of the decade was attained as throwing light upon the problem of reduction.

A feature which distinguishes the financial experience of the war period from periods of similar trial in the past relates to methods of public borrowing. During the War, a probably unprecedented use was made of the short-term obligation, while at the same time the plan of funding the short-term obligations thus incurred into long-term debt was carried to a higher point of development than ever before. The use of this method was practically identical in all of the belligerent countries, but naturally was carried on with far greater success in certain of them, owing to the fact that a greater degree of responsiveness on the part of the public was achieved in some than in others. This method of borrowing, as developed most successfully in England and the United States, was substantially as follows: A given quantity of revenue having been estimated as necessary

within a specified period, funds were then obtained direct from the banks through the issue of certificates of indebtedness or treasury bills, or the equivalent. These short-term obligations usually ran for only about three months. The intent of every issue was to obtain steadily from the community a proportionate part of its current earnings and thus to make sure of drawing off from the general fund of commercial income a sufficient amount to provide for public necessities. In placing these certificates with holders, use was usually made of the central banking mechanism, the method being substantially the same in Great Britain and in the United States. Certificates issued by the Treasury were placed in the hands of reserve banks which distributed them at first voluntarily and later by a process of assignment to members. The proceeds were marked up on the books of the subscribing banks as a credit to the Government. These deposits were then called when necessary, the Government giving as much notice as possible, and also endeavoring to pay out the funds as nearly as possible in the parts of the country from which they were drawn. After a period of some months had elapsed, a general loan was offered to the public and when subscribed, the proceeds were used to redeem the certificates and thus to reimburse the banks for the amounts they had advanced. Success in the method was dependent upon payment by buyers of the long-term bonds in actual cash or bank credit, but, as the War advanced, the practice grew of making a small preliminary payment, borrowing the remainder at the buyer's bank. The result then was chiefly to convert the obligation of the Government into the obligation of the individual citizen, presumably to be paid for out of his income or savings. As the floating debt outstanding increased in this way, and as the amount owing by bond buyers to the banks for the purchase of bonds increased, inflation naturally resulted, owing to the fact that bank credit was greatly outrunning in its rate of growth the rate of production of commodities. The effect was very largely the same as that which had been produced in former wars through the issue of irredeemable currency. Upon the close of the War, the stronger governments took measures to reduce their outstanding floating indebtedness, but during the first two or three years after the close of the struggle, the only countries that made any material progress in this direction were Great Britain and the United States. Italy later began to take steps along the same line but other belligerents met with no success.

**Internal and External Loans.** At the opening of the War, much discussion developed in all countries as to the relative advantage of internal or external loans. Embargoes and blockades made it possible for some to borrow abroad, but the major belligerents, as the War advanced, tended more and more to draw upon foreign markets. The United States was naturally regarded as a primary source of such loans, although during the early years of the War, London houses succeeded in distributing a great many of them. As the War advanced, investors grew more and more hesitant, and it became necessary to negotiate not with foreign investors but with foreign governments, either obtaining their permission or when possible inducing them to advance the funds themselves.

Thus arose the enormous international obligations which assumed a size that was wholly unprecedented and in a very real sense constituted a new phase of national finance. After the close of the War, there ensued a period of funding during which the outstanding foreign debts were converted largely into permanent bonds. Great changes in amount occurred. This period is still incomplete.

The table on page 547 reviews for several of the belligerent countries the situation at about the middle of 1927 (when conditions were most critical) as regards the division of public debts between internal and external obligations.

**War Banking and Finance.** From the date of the entry of the United States into the War, the function of the Federal Reserve System became almost exclusively that of financing the process of borrowing from the people. During the years 1917, 1918, and 1919, the Government increased the national debt from a little over \$1,000,000,000 to a little over \$25,000,000,000. These great loans were for the most part placed first through the banks and then with the rank and file of the investing public. It would probably have been impossible to dispose of the enormous quantities of bonds which the Government was obliged to sell in order to provide itself with funds without some kind of special banking aid. Such aid was particularly necessary in view of the fact that it had been determined by the Treasury authorities to dispose of the bonds at a rate of interest quite materially below the prevailing rate in the market. The first issue of Liberty bonds was sold at  $3\frac{1}{2}$  per cent and as subsequent issues were put out the rate was gradually raised until it reached  $4\frac{1}{4}$  per cent on the fifth, the Victory Loan (1919); although it should be remembered that the first loan bearing  $3\frac{1}{2}$  per cent had been wholly exempt from taxation of all classes, while subsequent loans were only partially so exempt. That the public might be induced to purchase up to the full extent of its saving power, paying for the bonds it thus bought on the installment plan, Federal Reserve Banks were instructed by the Government through the Federal Reserve Board to fix a rate for the rediscount of paper equal to the coupon rate on the Liberty bonds. Commercial banks generally were induced to discount directly for their customers at the same figure. Thus a buyer of bonds who was unable to pay for them in full, borrowed from his bank the additional amount he needed, the bank carrying it without cost to him since the coupons provided for the borrower's own interest charge. The bank then rediscounted such paper at the same (coupon) rate with the Federal Reserve Bank of its district. This policy was very successful in "stabilizing" the rate of interest, but it also tended to transfer the principal burden, for the time being at least, to the banks. The system was perfected through the steady issue of Treasury certificates sometimes as often as twice a month, these certificates running for 90 days as a rule and being funded at the end of that period into the successive issues of Liberty Bonds which were then subscribed for and carried as indicated. The burden resting upon Federal Reserve Banks thus became heavier and heavier as the War advanced and as successive issues were sold. Hence the reduction of the reserve ratio (ratio of gold to demand liabilities) of the system, which fell from about 90 per cent

before the War to about 52 per cent at the end of 1918, shortly after the Armistice. The fifth Victory Loan, which was floated early in 1919, was sold upon the same general principles that had been pursued in the earlier financing and resulted in increasing the burden resting upon the reserve system still further. The successful floating of this loan was followed by a speculative development of business and especially of foreign trade, which continued during the year 1919, and although checked early in 1920 did not reach its peak until about the close of the latter year.

Prices during the War had tended to rise rapidly as a result of a variety of causes. Of these, the principal was the tremendous demand exerted by all governments for commodities, coupled with the natural shortage in production which resulted from the withdrawal of a large part of the productive labor of all of the Western nations for the purposes of war. A contributing cause of the rise in prices, however, was found in the suspension of specie payments and excessive issue of currency which produced the condition of "inflation" reflected in unduly high prices for commodities and services of all classes. This price and wage advance continued steadily up to a peak in May, 1920, at which time the index number of prices was approximately 270 measured from a base in 1913 taken as 100. The check to expansion and wholesale-price advance administered early in 1920 has been variously explained and has been popularly attributed in the United States to the fact that Federal Reserve Banks toward the end of 1919 resolved upon the so-called deflation policy.

This deflation policy took form as an advance of interest rates above the low levels that had been established during the Liberty Bond period. It was aided by a more strict interpretation of the eligibility of paper for rediscount, coupled with an effort to induce borrowers who had obtained advances on Liberty Bonds as collateral to settle these loans and thus to take them out of the banks. The inadequacy of this explanation is indicated by the fact that the recession in business and prices which set in early in 1920 did not originate in the United States but was first indicated by the collapse of the silk market in Japan, while in most foreign countries no very definite deflation effort was undertaken until after the business recession had begun.

Federal Reserve discounts did not reach their peak until the end of 1920, about eight months after the business decline had started. At that time, total assets of the Reserve Banks were approximately \$5,000,000,000 while bills discounted were about \$2,700,000,000 and currency outstanding was about \$3,336,000,000. As the decline of business became more pronounced during 1921, the price level gradually sank to approximately 140, or a little more than half its level at the peak, while discounts at Federal Reserve Banks had been reduced by the end of 1921 to less than \$1,150,000,000. Notes at the same time receded to about \$2,400,000,000, thus contracting over one-fourth of their maximum amount.

The inability of foreign countries to settle their enormous purchases in the United States had led during the War to very heavy advances made by the Government to foreign governments and expended almost entirely in the



United States. These advances were to be continued until about the middle of 1919, eight months after the Armistice, and amounted to about \$9,500,000,000. When they came to a close, there ensued a period of trade expansion already noted during which considerable advances were made by American banks and business houses for the purpose of carrying foreign buyers as long as possible. As it became more and more evident that foreigners would not be able to liquidate these debts in full, banks and exporters began to withdraw these credits and the large movement of gold into the United States which had been very marked during 1916 and 1917 was resumed.

From the opening of the War in 1914 to the close of 1923, the total net importations of gold into the United States amounted to about \$2,150,000,000 and the total gold holdings of the Federal Reserve Banks rose to about \$3,200,000,000. At the same time, the ratio of reserve to liability advanced to approximately 78 per cent. The vast accumulation of gold thus attained by the Reserve Banks was maintained for a year or more nearly intact, but the period of influx was followed by a transition period in which irregular and fluctuating movements became characteristic, and this in turn gave way to an outflow which in 1927-28 took over \$500,000,000 of gold out of the United States. Much of this metal went to France and to other countries which were reestablishing their vault reserves preparatory to monetary reform.

The general situation and development of the Federal Reserve System during the two years following the close of the inflation period was substantially as follows: Immediately after the completion of the task of readjusting the discount rates and business which culminated in the spring of 1921, Federal Reserve Banks endeavored to return to a basis in which their principal activity would be devoted to commercial undertakings while they sought to divest themselves so far as they could of government obligations and to induce the investment public to take up and hold such securities.

The result was a steady decline in their activity, since they had consistently refused to enter into any considerable competition with the larger member banks which held their stock. Coupled with this change of policy was a second remarkable transformation of their position, owing to the steady and great movement of gold into the United States, which resulted in building up enormous specie reserves in the hands of Federal Reserve Banks. When recovery from the speculation in commodities which had brought on the depression of 1920-22 was fairly complete, influx of gold combined with other factors to induce a period of low discount rates. These were availed of to aid Great Britain and other countries in restoring a gold standard of currency, and through international agreements between the Reserve System and the Bank of England, rates were forced still lower. The outcome was an unprecedented era of stock speculation centering in New York during 1927-29.

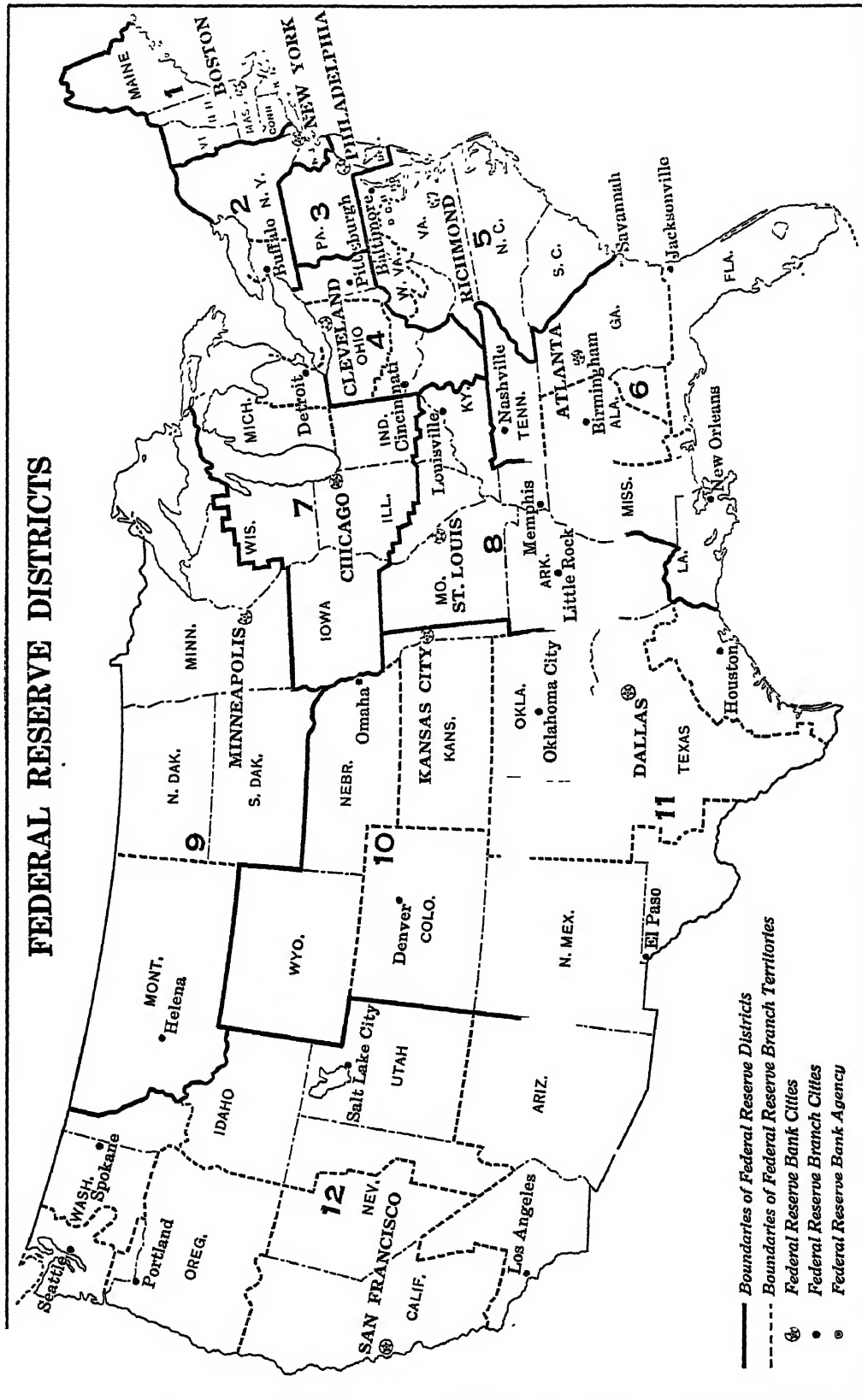
**Federal Reserve System.** The war period with its sequel had a peculiarly important relationship to American banking conditions because of the fact that, simultaneously with the opening of the War, the United States had arranged to organize an entirely new banking system—the so-called Federal Reserve. This banking system had been framed entirely

without reference to war necessities but was just on the point of taking effect when the struggle broke out in Europe. During the first two years—1915 and 1916—in which the United States was a neutral, the Federal Reserve System was practically in process of organization and the task of installing its various elements was in progress. Its business during that period was small; but with the entry of the United States into the active participation in the struggle early in 1917, the Federal Reserve System became a war banking system almost exclusively, and this character it retained until the struggle was over and the great advances made by the United States to European countries had been completed and the Liberty Bond issues largely growing out of them had been financed and digested by the banks and the public. Thereafter, the Federal Reserve System was able once more to turn its attention to the tasks of peaceful finance and to assist in restoring more normal condition.

Immediately after the inauguration of President Wilson in 1913, a bill which had previously been developed under the direction of a sub-committee in the preceding Congress was introduced (June, 1913) and thereafter considered and adopted by the House of Representatives on September 17. This measure was considerably modified in the Senate, but in conference committee it was amended back into nearly its original form, becoming a law on Dec. 23, 1913. As thus passed, the act provided for the establishment of a Federal Reserve System in which all national banks were obliged to take membership by subscribing 3 per cent of their capital and surplus to the stock of institutions to be organized in a number of districts throughout the country and known as Federal Reserve Banks. These banks were corporations chartered for 20 years under Federal authority, receiving deposits only from the Government and from their member banks (though subsequently allowed to receive deposits from other banks under certain conditions), their chief duties being the issuing of notes and the holding of the reserves of their members. Their business consisted primarily of rediscounting paper for their members, although they were also authorized to buy paper (of the same kind that had been made rediscountable) in the open market, should they see fit. In issuing notes, the Reserve Banks, as they were popularly called, were authorized to deposit eligible rediscounted paper with their chairmen (the Federal Reserve Agents), acting as trustees for the Government, which then issued an equal amount of notes to the Reserve Bank. The latter then placed them in circulation by paying them out or handing them to members who had requested such accommodation. By a later amendment, gold might also be deposited with the chairman of the local board in lieu of eligible paper. These notes were made obligations of the United States and receivable for all public dues. An organization committee, created under the act, eventually divided the country into districts and established twelve banks.

Government control of the institutions was provided for by authorizing the Federal Reserve Board to name three out of nine directors for each of the Reserve Banks, the other six members being required to include three business men and three bankers, one business man and one banker being selected by banks voting individually, in

# FEDERAL RESERVE DISTRICTS



- Boundaries of Federal Reserve Districts
- - - Boundaries of Federal Reserve Branch Territories
- ⊙ Federal Reserve Bank Cities
- Federal Reserve Branch Cities
- ⊙ Federal Reserve Bank Agency



each of three distinct groups (including the small, medium, and larger banks of each district). It was further provided, in order to insure democratic government of the banks, that each bank should have but one vote regardless of capitalization. With reference to reserves, the act required that the 25 per cent reserve formerly required in central reserve cities be cut to 18 per cent of demand obligations; likewise also the 25 per cent formerly required in reserve cities was cut to 15 per cent, and the 15 per cent in other places was cut to 12 per cent. Of these reserves, 7 per cent was to be placed by central-reserve-city banks with their reserve bank, 6 per cent by reserve-city banks and 5 per cent by all others. Time deposits were made subject to a 5 per cent rate throughout. Federal Reserve Banks were to be authorized to pay 6 per cent cumulative dividends, after all expenses and allowances had been provided for, to their stockholders, and their remaining earnings were then to be paid to the Government.

An important feature of the act on its foreign banking side was found in the authorization granted the larger national institutions to establish branches abroad and in its grant of the power of accepting time bills (not over 90 days' maturity) to national institutions. In their ordinary rediscount operations, the Reserve Banks were limited to 90-day paper growing out of commercial, agricultural, or industrial transactions, speculative paper being barred.

The act as thus adopted was subsequently modified by a series of enactments. The important features in these amendments were: (1) enlargement of the acceptance power to 100 per cent of capital and surplus; (2) permission to National banks to subscribe to the stock of foreign banking enterprises formed for the purpose of establishing branches abroad; (3) termination of the reserve requirements of the original law and substitution therefor of a provision requiring all reserves to be kept in Reserve Banks, such reserve to consist of 13 per cent of demand deposits for central-reserve-city banks, 10 per cent for reserve-city banks, 7 per cent for all others, with time deposits at 3 per cent; (4) adoption of the so-called Edge Act authorizing the formation of corporations, for the purpose of making long-term investments abroad, National banks being permitted to subscribe to their stocks; (5) enlargement of amount of loans permitted to be made on the strength of Liberty bonds as collateral; (6) modification of voting arrangements governing the elections of directors in Federal Reserve Banks; and a few others. Of these amendments, the only one which fundamentally altered the structure and significance of the act was that transferring the entire reserves to the central institutions and the Agricultural Credits Act of 1923 which gave special privileges to paper growing out of farm credits (see AGRICULTURAL CREDIT). The so-called McFadden Act, of 1927, chiefly designed to relax the restrictions upon National banks, incidentally enlarged the rediscounting power and further gave to Reserve Banks "perpetual" or indefinite charters, revocable by Congress for cause.

As provided for by the Act of 1913, the Federal Reserve System went into operation (preliminary details having been arranged by an organization committee) technically on the 10th of August, 1914, the banks themselves being

actually opened for business on November 2, while reserves were paid over on November 14 of the same year. The two years 1915-16 were occupied largely in developing methods of discounting and establishing new plans of note issue. A constructive piece of work carried through during these years was the establishment of the Gold Settlement Fund at Washington; whereby the Federal Reserve Banks were enabled to clear on the central set of books conducted by the board the bulk of their obligations against one another, thereby avoiding the shipment of specie. This clearance, at first carried on once each week, was later made a daily clearance, and eventually came to supersede in large part the work of the local clearing houses.

With the entry of the United States into the War early in 1917, a new epoch in the history of the Federal Reserve System and of the banking system of the United States in general opened. The fundamental problem at the opening of the War was that of finding means to supply the Treasury with necessary funds. This object was temporarily accomplished by direct borrowing from the Federal Reserve Banks on short-term treasury certificates. The system of Liberty Loans was then developed and the Reserve Banks were made the active agents of the Treasury in placing them. The Federal Reserve Act had originally provided for making the banks the fiscal agents of the Government and this was now interpreted to include not only sub-treasury functions but also those relating to the sale and distribution of bonds. The importance of the sub-treasuries accordingly was reduced and they were eventually closed in 1920, but during the latter part of the War and the period just after it, their activity was purely nominal. With the issuance of the First Liberty Loan in July, 1917, the activity of the Federal Reserve Banks was largely transferred to a war basis, including the management of public finance, and continued so throughout the remainder of the struggle.

**Development of Clearing System.** The national system of clearance which has constituted one of the most outstanding achievements of the Federal Reserve Board under the mandatory provisions of the original act had attained only a moderate degree of development prior to the close of the War. It was not put into effect at the outset of the Federal Reserve organization, but first took form in a definite way on July 1, 1916, when arrangements were made for collecting checks on member banks or on non-members which remitted at par without charge for exchange or collection. Credits and debits were entered upon a deferred basis corresponding to the amount of time required actually to collect the items. From the time that the system was fully inaugurated, the totals transferred by this means rapidly grew, the system largely superseding clearing houses in many parts of the country, a number of the latter being closed in the meantime, as a result. Owing, however, to the fact that as a result of the clearance at par without charge many small banks lost a valued source of income, criticism arose and during the years 1920-23, hostile legislation was undertaken in eight Southern States and suits were brought against Reserve Banks for the purpose of having their clearance function declared unconstitutional. Several of the cases were finally carried to the Supreme Court. In these, the exercise of the clearance function

was upheld, subject to some important reservations, but the latter resulted in considerably restricting the power of the Reserve System and substantially lessened the total number of banks remitting at par. Nevertheless, the par collection system has had a normal growth by reason of its own recognized merits and has greatly reduced the evil of high exchange charges the country over.

# RESOURCES AND LIABILITIES OF THE TWELVE FEDERAL RESERVE BANKS COMBINED

(In thousands of dollars)

RESOURCES	Dec. 26 1928
Gold with Federal reserve agents	1,171,408
Gold redemption fund with U. S. Treasury	83,171
<i>Gold held exclusively against F. R. notes</i>	<i>1,254,579</i>
Gold settlement fund with F. R. Board	750,186
Gold and gold certificates held by banks	579,474
<i>Total gold reserves</i>	<i>2,584,239</i>
Reserves other than gold	104,588
<i>Total reserves</i>	<i>2,688,827</i>
Non-reserve cash	64,098
Bills discounted:	
Sec. by U. S. Government obligations	713,759
Other bills discounted	453,820
<i>Total bills discounted</i>	<i>1,167,579</i>
Bills bought in open market	489,270
U. S. Government securities:	
Bonds	52,717
Treasury notes	104,759
Certificates of indebtedness	74,852
<i>Total U. S. Government securities</i>	<i>232,328</i>
Other securities	10,135
<i>Total bills and securities</i>	<i>1,899,312</i>
Due from foreign banks	728
Uncollected items	722,108
Bank premises	60,629
All other resources	7,704
<b>TOTAL RESOURCES</b>	<b>5,443,401</b>
LIABILITIES	
F. R. notes in actual circulation	1,910,838
Deposits:	
Member bank—reserve account	2,409,195
Government	15,782
Foreign bank	7,534
Other deposits	22,582
<i>Total deposits</i>	<i>2,455,093</i>
Deferred availability items	654,553
Capital paid in	146,868
Surplus	239,319
All other liabilities	42,730
<b>TOTAL LIABILITIES</b>	<b>5,443,401</b>
Ratio of total reserves to deposit and F. R. note liabilities combined	61.6%
Contingent liability on bills purchased for foreign correspondents	327,315

**Inter-Governmental Debts.** When the United States entered the War, it found nearly all of the Allied powers approaching exhaustion. England had previously made large war loans to the Allies; but could no longer continue them. Advances were accordingly authorized by Congress in 1917 from the Treasury of the United States. They were steadily made during the remainder of the War and were continued about eight months after the conclusion of the struggle. Thus a total sum of about \$9,500,000,000 was loaned, the proceeds being used in large measure for buying in the United States commodities that were needed for exports. The debts thus contracted were represented by temporary certificates evidencing the obligations in question and signed by the representatives of the various borrowing European countries. Eventually, the question of "funding" or pro-

viding for their definite payment and for the rate of interest they should bear meanwhile became a pressing question. No interest on them had been paid from the time of their issue and Congress eventually passed, on Feb. 9, 1922, the so-called Debt Funding Commission Act in which a commission of five, headed by the Secretary of the Treasury, was directed to make arrangements for settling the obligations of the various countries. These obligations growing out of the War, but not including bonds received from the sale of surplus war supplies and other transactions, and amounting to \$473,000,000 were eventually established as follows:

Bonds of foreign governments received under agreements for funding of their debts to the United States, pursuant to the acts of Congress approved Feb. 9, 1922, Feb. 28, 1923, Mar. 12, 1924, May 23, 1924, Dec. 22, 1924, Apr. 28, 1926, Apr. 30, 1926, and May 3, 1926.

Belgium	\$411,180,000.00
Estonia	13,830,000.00
Finland	8,764,000.00
Great Britain	4,480,000,000.00
Hungary	1,942,200.00
Italy	2,027,000,000.00
Latvia	5,775,000.00
Lithuania	6,218,167.50
Poland	178,560,000.00
Rumania	65,660,560.43
<b>Total</b>	<b>\$7,198,879,927.93</b>

Obligations of foreign governments, under authority of acts approved Apr. 24, 1917, and Sept. 24, 1917, as amended (on basis of cash advances, less repayments of principal):

Czechoslovakia	61,974,041.10
France	2,911,507,904.09
Greece	15,000,000.00
Russia	187,729,750.00
Serbia	26,052,753.01
<b>Total</b>	<b>3,202,264,448.20</b>

Some relatively small loans had likewise been made by sundry of the Continental powers to one another, France advancing nearly \$2,500,000,000. Out of this situation arose in 1919-22 the demand for international debt cancellation. The result was a long-drawn series of negotiations resulting in some settlements but still leaving, at the end of 1928, many unadjusted accounts.

**German Indemnity.** The most troublesome phase of the debt situation produced by the War grew out of the establishment of an indemnity or reparation for Germany. (See REPARATIONS for an extended treatment of this subject.) Because of the inability of the Powers to hasten a settlement, the questions of international debts and reparations passed into a waiting stage which lasted for several years. The only important progress during the period was the funding of the British debt to the United States which was finally effected in January, 1923 (formal agreement, June 18, 1923). Great Britain recognized the entire indebtedness and arranged to pay it over a period of about 61 years with an annual interest rate of 3 per cent, rising after 10 years to 3½. As the United States had outstanding the bonds which were issued to provide the funds advanced to Great Britain, and was paying 4½ per cent on them, the arrangement with Great Britain was equivalent to partial cancellation, although not technically so. Reparations problems, however, were growing more and more acute, and the general disorganization of economic life in Germany was so serious and extensive as to compel resort to new remedies. The result was an international



conference which at Paris in 1924 formulated the so-called Dawes plan under which German payments were placed in the hands of a reparations agent who was to collect annual payments rising gradually to 2,500,000,000 marks in and after 1929. This plan had been carried into effect up to the opening of 1929 when a new conference was summoned, which continued until June when a plan of settlement was announced. This was the so-called Young Plan. It slightly reduced the annuities payable by Germany and received final discussion in an international conference at The Hague which closed at the end of August. See REPARATIONS.

Meantime the United States, through the World War Debt Funding Commission, had negotiated treaties modeled on that with Great Britain, twelve in number and amounting to a cancellation of from 35 per cent to 75 per cent of the debt owing by various countries. All had been ratified at the opening of 1929 except that with France. The French treaty was acted upon by the Chamber in the summer following.

**Debts, Prices, and Exchange.** The growing proportion of debt both before and in a more striking degree after the War, as compared with the volume of national wealth, became an alarming feature because of the disproportionate absorption of national income in meeting debt charges. Inasmuch as existing debts were incurred in units of currency of the pre-war gold value, attempt to pay them in full at the close of the period would involve an enormously greater transfer of wealth than that which was originally borrowed. Alternative to such a course would be the partial repudiation of the debts, either by "devaluation" (change in the gold equivalence of the currency unit) or by the co-called "capital tax," which amounts to an appropriation of enough of the wealth of the propertied class to pay the state's debt to that class. Some settlement of this question would be necessary if the countries were to attempt to restore a sound banking and currency system. The difficulty in the case was particularly marked in those countries which have heavy foreign debts because they must usually settle in terms of gold. This difficulty, so far as internal debt goes, has been technically met in various ways. Great Britain, by returning to her old gold standard at par, accepted the full face value of her original pound sterling. Germany, on the other hand, practically wiped out (with some trifling exceptions and allowances) the whole

of her internal debts by abandoning her old currency, which had been almost immeasurably depreciated in 1924, and substituting a new unit equal in gold value to her old mark, but now called the Reichsmark. France and Italy pursued the policy of devaluation. Each had had before the War a currency unit worth 19.2 cents gold, but Italy stabilized in 1927 at about 5¼ cents and France in 1928 at about 3.04 cents.

**Proportion of Loans to Taxation.** Authorities on public finance prior to the War had generally taken the view that no public loan should ordinarily be floated without the imposition of taxation in an amount sufficient to provide for interest on the principal thus created and for an amortization or sinking fund sufficient eventually to extinguish the debt. At the opening of the War, there was a widespread opinion among theorists both in the United States and Great Britain in favor of restricting loans to not over 50 per cent of total outlay, the balance to be raised by taxation. On the Continent, governments found their populations very restive under taxation and before the War were disposed to make use of deficit financing through public loans because of the already existing burden. During the War, both Germany and France relied largely on borrowing. No consistent policy of financing in this respect was pursued during the War.

**Change in Revenue Systems.** In the endeavor to avoid unnecessary increase in debt, England and the United States early in the War resorted to heavy taxation, adopting income and excess-profits taxes upon a large scale and particularly advancing the rates of surtax up to figures never before thought of. Other countries were slower to resort to heavy taxes because of the reluctance of their own citizens to submit to such control, yet it was practically inevitable that they should eventually do so and in substantially all countries there was an effort to get away from public borrowing and shift over to a basis of budgetary balance. Only by so doing, it was recognized, would it be possible to restore a condition of solvency in the principal countries. The result of this necessity was to emphasize the finding of new sources of income and hence the reconstruction of fiscal systems. How this change worked may be noted from a comparison of the sources of income in France, Germany, and the United Kingdom, shown in the following table.

## FRANCE

(In million francs)

	1919	1920	1921	1922 *	1923 *	1928-29
Direct taxes	1,069	1,620	1,872	2,507	2,983	39,353.0
Stamp taxes	2,195	3,260	3,289	3,515	3,176	
Tax on securities	290	568	926	737	821	
Sales tax	269	1,256	1,911	3,058	2,513	
Customs duties	1,477	1,596	1,197	2,466	1,928	
Indirect taxes	1,779	2,612	2,919	2,927	2,682	556.6
Sugar taxes	377	444	365	543	519	
Monopolies	1,052	1,582	1,711	1,802	1,837	
Post Office	589	921	1,071	1,108	...	
Public domain	155	151	113	183	176	
Miscellaneous	455	938	1,173	985	1,420	2,565.2
		14,948	16,547	19,881	18,060	42,919.5
Total ordinary	9,707					2,200.5
War-profits tax	672	3,224	3,169	3,050	1,225	
Sale of war material	1,207	1,649	1,501	500	...	
Total general budget	11,586	19,821	21,217	23,381	19,285	45,117.0
Special budget	.....	.....	326	1,310	.....	288.2
Grand total	11,586	19,821	21,548	24,691	19,285	45,405.2

\* Estimated.

## GERMANY

In billions (milliards) of marks

	1919	1920	1921	1922 *	1923 *	1928
<b>Taxes on wealth and exchange:</b>						
Income	....	10.2	29.7	350.	450.	646.0
Corporation	....	0.7	1.6	5.	7.	131.0
Produce ( <i>Kapitalertragsteuer</i> )	....	0.9	1.5	2.	....	....
Emergency levy ( <i>Reichsanopfer</i> )	0.002	9.9	0.8	4.	....	....
Property ( <i>Vermögensteuer</i> )	....	....	....	....	60.	105.3
Possessions ( <i>Besitzsteuer</i> )	0.05	0.01	0.1	0.002	....	....
Inheritance	0.09	0.3	0.6	1.5	2.	....
Turnover ( <i>Umsatzsteuer</i> )	0.8	5.1	11.5	177.5	500.	209.1
Real estate purchase ( <i>Grundwerbsteuer</i> )	0.06	0.7	0.7	1.5	1.4	....
Dividends and interest ( <i>Kapitalverkehrssteuer</i> )	....	....	....	35.2	65.8	35.7
Motor vehicles	....	....	....	0.1	4.	....
Insurance	....	....	....	1.3	1.5	....
Races and lottery	....	....	....	0.8	2.2	159.4
Stamps	0.9	1.7	6.8	2.1	4.5	....
Transportation	0.5	1.4	2.2	34.2	520.	83.1
Non-recurring war taxes	1.2	5.6	5.4	....	....	....
<b>Total</b>	<b>3.7</b>	<b>35.7</b>	<b>59.1</b>	<b>614.9</b>	<b>1,617.9</b>	<b>....</b>
<b>Taxes on commodities:</b>						
Customs	1.1	2.2	5.9	88.	500.	285.9
Coal	1.6	4.9	7.0	150.	2,750.	....
Other excises	1.7	4.1	8.3	59.6	189.	390.4
<b>Total</b>	<b>4.4</b>	<b>11.2</b>	<b>21.2</b>	<b>297.6</b>	<b>3,439.</b>	<b>676.3</b>
Miscellaneous	1.1	6.1	6.93	119.1	574.	135.8
<b>Grand Total</b>	<b>9.2</b>	<b>53.0</b>	<b>149.6</b>	<b>1,071.6</b>	<b>5,640.9</b>	<b>2,134.5</b>

\* Budget estimates.

## UNITED KINGDOM

(In millions of £)

	1921	1922	1923	1928 *
Customs	149.4	134.0	123.0	111.6
Excise	133.6	199.8	194.3	163.7
Motor vehicles	....	7.1	11.1	24.1
Estates	40.9	47.7	52.2	77.3
Stamps	22.6	26.6	19.6	27.0
Land tax	0.7	....	....	....
House duty	1.9	0.6	....	....
Income tax	359.1	1.9	2.9	.8
Excess profits	290.0	396.3	398.8	250.5
Corporation profits	....	218.2	80.5	3.0
Land-value duties	0.7	0.7	17.5	2.7
		0.1	0.1	....
<b>Total tax revenues</b>	<b>998.9</b>	<b>1,032.7</b>	<b>856.7</b>	<b>664.8</b>
<b>Non-tax revenues</b>	<b>340.7</b>	<b>394.2</b>	<b>268.2</b>	<b>132.0</b>
<b>Total revenues</b>	<b>1,339.6</b>	<b>1,426.9</b>	<b>1,124.9</b>	<b>796.8</b>

\* The figures are for Great Britain and North Ireland.

**Relations with Banks.** Owing to the fact that the War took all countries by surprise, bank loans were necessary in nearly every case in order to furnish funds for immediate requirements. This was an inevitable episode in war finance and was not open to criticism except in so far as it might be adopted as a systematic policy. Fear of popular discontent led a good many countries to continue the short-term financing much longer than they otherwise would, the only countries that possessed the real internal strength to tax severely and effectively during the War being Great Britain and the United States. In falling back upon the banks, the various governments resorted to methods of borrowing that had not been tried in precisely the same form during the course of former struggles. Relatively small use of legal-tender paper or "flat money" was made but the banks were required to take and distribute short-term obligations which were then funded from time to time into longer-term loans, as circumstances seemed to permit. The fact that the subscribers to these loans were encouraged to borrow from the banks the funds which were necessary in order to enable them to make good their subscriptions naturally tended to produce in all countries a highly inflated condition of prices, together

with a steady disappearance of specie, notwithstanding an early embargo upon movements of coin which took effect in nearly all countries, comparatively early in the struggle although at slightly differing dates.

The United States was the last to declare such an embargo, owing to the fact that it did not enter the War until the year 1917 was well advanced. Heavy borrowing at the banks in nearly all countries left these institutions at the close of the War in a very unliquid condition, their government paper holdings being "frozen" owing to inability to find buyers for them either at home or abroad due to the deterioration of public credit. But reliance upon foreign borrowing which was characteristic of practically all European countries that had found themselves able to get access to other markets, left all of them at the close of the War with tremendous external obligations which they were in no position to liquidate, owing to the fact that as a result of the conflict their productive power had been very greatly decreased. An unavoidable consequence of the drawing off of a large share of the population from economic occupation had been in all of the combatant countries a corresponding curtailment of productive effort.

The close of the War, therefore, found practically all European countries facing a highly complex problem in public finance—that of reducing the cost of their government to such an extent as to make it possible to pay the necessary sums from the proceeds of taxation, thereby avoiding further borrowing while at the same time enlarging their surplus export power sufficiently to provide a balance large enough to furnish the necessary funds abroad with which to pay interest and maturing obligations. This latter necessity was the more obvious because of the fact that for one reason or another it had been found necessary to “release” a great deal of gold as the War advanced, thereby reducing the cash stock and in some cases bringing the specie available to so low an ebb that it was exceedingly doubtful whether any restoration of gold redemption could be brought about in the near future.

It remained true, however, that a good deal of the gold “released” had been drawn from circulation leaving the sums in bank reserves relatively little depleted absolutely, though of course wholly inadequate, as compared with the huge outstanding volume of obligations. Great Britain proved to be the only one of the major countries which was able through severe taxation and exchange control to bring her monetary system back to the pre-war base, while in France and Italy, devaluation on a drastic plan was used to bring about a bearable relation between specie and currency outstanding. Germany practically repudiated her currency and made a fresh start, while in other countries various measures of devaluation or revaluation were resorted to. With the aid of the Federal Reserve System, various countries, including France and England, have been able to reimport specie when needed for the building up of their reserves.

# INDEX NUMBERS OF WHOLESALE PRICES (ALL COMMODITIES) \* 1913-1924

Year	United States; Federal Reserve Board (90 quotations)	Canada; Department of Labor (271 quotations)	United Kingdom; Board of Trade (150 commodities)	France; <i>Bulletin de la Statistique Générale</i> (45 commodities)	Japan; Bank of Japan for Tokyo (56 commodities)
1913	100	100	100	100	100
1919	211	198	219	183	241
1920	239	223	233	183	242
1921	149	150	156	133	175
1922	158	147	150	136	175
1923	164	147	159	124	183
1924	159	145	160	121	166

\* Figures taken from computations of Federal Reserve Board (*Bulletin*, Dec., 1924 and Dec., 1925. They show yearly averages converted to a gold basis.

## PRICE MOVEMENTS (WHOLESALE PRICES) 1927-1928, ALL COMMODITIES

Month	United States (Bureau of Labor Statistical) *	England (Board of Trade)	France (Statistical Bureau)	Canada (Dominion Bureau of Statistics)	Japan (To-kyo)
1927					
January	97	144	622	151	170
February	96	143	632	150	171
March	95	141	641	149	171
April	94	140	636	149	170
May	94	141	629	152	171
June	94	142	623	154	173
July	94	141	617	152	170
August	95	141	618	152	167
September	97	142	601	151	169
October	97	141	587	152	170
November	97	141	595	152	168
December	97	140	604	152	168
1928					
January	96	141	607	151	169
February	96	140	609	151	169
March	96	141	623	153	169
April	97	143	619	153	170
May	99	144	632	153	171
June	98	143	626	150	169
July	98	141	624	150	169
August	99	139	616	149	170
September	100	138	620	96 *	174
October	98	138	617	95 *	174
November	97	138	626	95 *	173
December	97	138	624	95 *	174

\* New index—1926 = 100.

NOTE.—These indexes are in most cases published here on their original bases, usually 1913 or 1914, as determined by the various foreign statistical offices which compile the index numbers and furnish them to the Federal Reserve Board. In several cases, however, viz., France, Netherlands, Japan, New Zealand, and South Africa, they have been recomputed from original bases (1901-1910; 1910-1910; October, 1900; 1909-1913; 1910) to a 1913 base. Further complete information as to base periods, sources, numbers of commodities, and the period of the month to which the figures refer may be found on pages 769-770 of the *BULLETIN* for November, 1927.

Results of Inflation Policy. The self-conscious inflation policy which was thus adopted by the belligerent governments soon proved disastrous. It was not only exceedingly disturbing to business, but it also defeated the efforts of the governments which resorted to it as a fiscal expedient. Price levels rose rapidly and enormously in nearly all countries, as may be seen from this table of index numbers.

The effect of this advance in prices, brought about as it was by the practice of borrowing overheavily at banks, was to make commodities and services cost enormously more than they otherwise would. Particularly harmful results were experienced in the case of those countries which found it necessary to apply to foreign markets for munitions and supplies. Nearly all of the European countries had found themselves obliged at an early stage to buy heavily in the United States. Although the American price level had risen considerably even before the United States entered the War, the advance had not been comparable to that which occurred at a later date.

European Banking Development. European banking was in a far more stable and completed condition at the opening of the War than was the banking system of the United States, but the strain to which it was subjected was far more severe, relatively speaking, than that to which the United States was obliged to adjust itself. In a general way, the principal effect of the War was to bring about an extensive redistribution of specie, a great reduction in the bank reserves of some countries, an even larger relative reduction in these reserves as compared with outstanding obligations and a very material alteration in the character of the investments held by the banks, this change taking

STATISTICS OF MONEY AND CREDIT IN THE  
U. S.—1914-1923  
(000 omitted)

	All banks, national, State, and trust companies		
	General stock of money in United States	Loans and discounts	Deposits
June, 1914 *	\$3,738,288	\$15,288,337	\$18,517,732
June, 1915 *	3,989,456	15,722,440	19,135,380
June, 1916 *	4,482,891	17,811,605	22,773,714
June, 1917 *	5,407,990	20,594,228	26,062,986
June, 1918 *	6,741,072	22,514,828	27,748,471
June, 1919 *	7,603,366	25,255,171	32,665,246
June, 1920 *	7,909,998	31,208,142	37,315,123
June, 1921 *	8,099,006	28,932,011	34,844,572
June, 1922 *	8,177,477	27,860,443	37,194,318
June, 1923 *	8,603,732	30,416,577	40,034,195
June, 1924 *	8,846,500	31,427,717	42,954,121
June, 1925 *	8,303,632	33,883,733	46,765,942
June, 1926 *	8,428,971	36,233,490	48,882,296
June, 1927 *	8,667,282	37,270,378	56,735,858
June, 1928 *	8,118,091	39,542,067	58,413,127

\* Figures as of last week in month.

form as a great growth in the amount of government paper held by the banks and discounted for the several governments with a corresponding (relative) decrease in the amount of paper discounted for private citizens. A brief general survey of the banking situation of certain principal countries as it has developed during the period in question, and as it stands approximately, is shown in the table on financial statistics on page 558.

**Banking in England.** Opening the War with a well coordinated money and banking system, Great Britain shortly found it necessary to resort to an embargo on gold and an issue of government notes. The result was immediate depreciation of currency, inflation of prices, and disturbance of exchange. This latter gave rise to a "pegging" of the rate, as compared with dollars (and at the same time a pegging of francs in relation to sterling and dollars), the funds therefor being first supplied from the British Treasury and later through loans obtained from the United States. This situation continued until March, 1919, when the pegging was suspended and exchange left to take its own course, the embargo on gold being retained. Almost immediate reaction occurred in the value of sterling, steady recession taking place until Great Britain had been able in a measure to rectify her international position. Thereafter, every effort was directed toward a return to the gold standard, which was provided for in 1925, and at last fully made effective in 1928 through fusion of the war notes with Bank of England notes. Little change occurred in the general structure of Great Britain's banking system as a direct result of the War, although the creation of the Irish Free State separated a portion of the Irish banks from the general British money market, at least in theory, even while they continued to be closely associated with it in fact. Scotch and Irish notes, which had been made legal tender, were deprived of that quality after the Armistice. The Irish Free State in 1926-27 established its own currency system based on a unit equivalent to British sterling.

The principal obvious mark left by the War upon the British banking system is to be found in the great concentration of banking which has occurred, there being today only about 25 banks in the United Kingdom of which by far the more dominating position has been assigned to five or six of the British institutions with headquarters in London.

**European Banking.** The outstanding changes in European banking which took place during the War were, in theory and effect, very similar to those in Great Britain, although usually assuming a more extreme form. In France, a moratorium was declared shortly after the opening of hostilities, applying to deposits as well as notes. This was soon ended, but at no time during or since the War have Bank of France notes been convertible into coin. Today they can be redeemed in bullion in large amounts but the actual gold franc is still theoretical. Large support had been given by the Bank of France to the Government in the form of short-term loans, the result being an enormous increase in note circulation, although changes in the actual structure of banking in France have been fewer than in England. Provisions for the official control of exchange and prohibition of the export of capital were early introduced and have continued in effect. In 1924 France's banking problem was more than ever intimately associated with governmental budget conditions. The decline in exchange which carried the franc down to an ordinary level of about 5 cents soon after the opening of 1924 (a low point of 3.43 cents having been reached in the late winter of 1924), merely reflected the declining confidence of the foreign public in France and her budget management, due to the continuance of extraordinary budgets without provision to meet them, the continued insistence upon reparations at a rate probably out of the question, and the effort to rely upon inflation and short-term loans in lieu of taxation. Conditions became so alarming as to bring about pledges from the Poincaré Ministry in the spring of 1924 bearing upon the reintroduction of budget balances and heavier taxation designed to overcome existing evils. These efforts were successful, the franc being stabilized at the opening of 1928 at about 24 to the dollar by a return to what is called a gold-bullion standard.

In Germany, the shock to the banking system caused by the War was fully as severe as that felt elsewhere, but technically produced no great change during the continuance of the struggle. Early in August, 1914, the Government provided for a legal-tender currency which was later retired, its place being taken by Reichsbank notes. All notes and currency were declared inconvertible and a special type of loan banks was established. Partly as a result of strict military control and government regulation of prices, it was possible to maintain, up to the close of the War, a semblance of solvency. Immediately after the Armistice, this semblance largely disappeared, and rapid deterioration began, partly due to loss of specie, the restoration of the reserves to foreign banks which had been carried away, the necessity of paying for large quantities of raw material abroad and other factors of the same sort. The outcome necessarily was the steady recession of the mark, somewhat aided by apparently intentional inflation with shipment of paper marks and mark obligations abroad. According to expert Committee No. 2, whose report was rendered to the Reparation Commission in April, 1924, careful investigation showed that Germans had in this way disposed of a total abroad of nearly 8,000,000,000 marks, receiving, of course, goods in exchange to an equal amount, the marks in the meantime becoming practically worthless. Increasing difficulty con-

tinued and was greatly emphasized by the inability to obtain any balancing of the budget or any adjustment of reparation claims. The result was the mark was driven to practically nothing, the quotation at about the close of 1923 being \$0.00000000000022. At this microscopic figure, the mark was practically valueless and its place was rapidly being taken by foreign currencies.

Decisive deterioration in the quotation of the mark had set in about the middle of 1922 and continued more or less steadily from that day onward to the autumn of 1923, when effort was made to obtain a substitute currency by organizing the so-called "Rentenbank." This was a bank whose obligations were secured by mortgages upon the lands, houses, and industrial property of Germany, the unit in which they were expressed being designated as the "Rentenmark," presumably equivalent to the gold mark. During the winter of 1923-24, there was also gradually brought into existence under the supervision of Dr. Schacht, the so-called *Gold Discount Bank*, whose purpose it was to finance foreign transactions. This "gold" bank was such only in name as its capital was largely derived from English sources in sterling, while its foreign payments were made in sterling, it being thus really a sterling bank rather than a gold bank. The reparation committee's plan of 1924 led to the governmentally controlled bank which superseded both of these emergency establishments, becoming a new Reichsbank and reestablishing a gold currency in Germany with corresponding stability in foreign exchange based on a Reichsmark equal to the previous mark. German banking had not changed greatly in its external form, but the same tendency to consolidation apparent in England was felt also in Germany and resulted in a reduction in the number of independent banks, accompanied by some increase in the degree of their dependence upon the Reichsbank.

In other European countries, where central banking systems were in operation practically upon the same general basis as in England or France at the opening of the War, very much the same war changes were experienced. Practically all introduced gold embargoes which were continued after the close of the War and in most of them attempts were made, usually with but little success, to control the direction of foreign exchange. In Russia, practically the entire pre-war stock of specie was taken from the banks and eventually exported. Later, local prosecution and seizure of old hoards furnished a reserve for a new State Bank administering a currency based on the chervonetz, equal to 10 rubles, each equal to the pre-war gold ruble. Austria, too, lost her entire reserve of coin and was obliged to submit to a reorganization of her finance under the auspices of the League of Nations with a gold loan based upon a guarantee by the Allies themselves. In Italy, conditions more closely resembled those of France, and the restoration of governmental frugality under Mussolini had the effect of stabilizing the lira in 1925 and curtailing bank inflation. Among the so-called neutral countries, such as Switzerland, Holland, and the Scandinavian nations, conditions varied somewhat, but the general drift was toward increase of gold owing to payments made by belligerents for supplies that they needed. The result generally was to bring about an overexpansion of gold reserves with a cor-

responding tendency to inflation in bank obligations. Altogether, therefore, the tendency was somewhat parallel to conditions among the belligerents, although for different reasons. Subsequent to the War, this whole group of countries found itself better able to resume the free payment and movement of specie than before the struggle, yet disinclined to do it because of the fact that the principal customers were themselves on a paper basis.

**"Colonial" and Oriental Banking.** Conditions in the colonies of the various principal powers, prior to the War, had been generally dependent upon the situation in the parent countries. The War for the most part threw their systems of money and banking out of gear, partly by cutting off regular trade movements between them and the parent country, partly by leading them to declare embargoes, as in Canada and Australia, in the fear that otherwise they might lose their specie, as well as out of a sense of loyalty to the colonizing nation itself. As a result of these conditions, abnormal difficulties were encountered in those parts of the world where the so-called gold exchange standard had been established, e.g., in India, the effort being there to bring about a conservation of specie and a fair stability of value. After the close of the War these difficulties disappeared in some measure, still leaving the dependencies, such as Australia, Canada, and others, inclined to move parallel to the currency of the parent country.

In Japan, where an independent gold-standard system had existed for many years, the embargo on gold early established during the War was maintained, notwithstanding that the stock of metal there was large and foreign trade in a fairly satisfactory condition. The earthquake of 1927 and the resultant troubles found Japanese business conditions weak and threw them into complete disorder, a general reorganization ensuing. No serious changes in the structure of banking took place in the colonial or Oriental countries upon any considerable scale during the post-war period, perhaps the outstanding development being the creation of a reserve bank in South Africa, closely modeled upon the Federal Reserve System.

In India, the introduction of central banking and a theoretical gold standard resulted from the work of the Indian Currency Commission of 1926. In other countries, effort was made to popularize the banking systems and so far as possible rather to diminish the power of central oversight so far as practicable. A group of new and rather weak central banks came into existence then and there. The future as relating to them is doubtful. Price movements in these economically dependent countries were naturally governed to no small extent by the price movements in the parent country, as may be seen by consulting the table of prices printed on page 555.

**Post-war Changes in Foreign Banking.** The War naturally affected the credit system of all nations very profoundly, resulting in most countries in an enormous expansion of credit both in the form of notes and of deposits, while practically everywhere the banks of the several countries became overloaded with government securities of various kinds either purchased for their own account or taken as collateral behind paper which had been left with them by customers for the purpose of carrying these bonds



pending gradual liquidation of subscriptions to them. After the close of the War, the general development of banking in most countries passed through considerable changes of volume and character of transactions but the alteration in banking structure was comparatively slight. The decade after the War was a period of restoration of sound conditions in banking rather than of real change in structure.

The general effect of the War, as noted above, was to tend toward concentration of banks—England, for example, reducing the number of institutions from upward of 100 to only about 25, of which five were of preponderating importance. In France, the drift toward concentration was not so strong because France had already reached a highly concentrated position in banking prior to the War. In Germany, the Reichsbank became little more than a tool in the hands of the Government, being used there for the purpose of floating short-term loans and later of issuing paper currency in almost unlimited volume to care for the needs of the Government and avoid the necessity for heavier taxation. After the War and as a result of the reparations discussions culminating in 1924, the Reichsbank was entirely reorganized but largely on former lines. In Italy, the whole power of note issue was placed in the hands of the Bank of Italy which became a central institution in the modern sense.

Another phase of post-war banking was seen in the fact that the portfolios of practically all European institutions changed greatly. In lieu of the short-term paper which formerly occupied so nearly exclusive a place, the primacy was taken by government obligations and so-called short-term notes, "direct advances to the state," and other types of public obligations. Still a third important change in the situation after the War was seen in the fact that so many banks and banking institutions were either driven into failure or obliged to go out of business or to amalgamate with others because they had become overburdened with non-liquid paper. The banks in such cases frequently were found to have ventured a good deal of their funds in foreign trade operations of one kind or another and there was great mortality and severe losses among the foreign banks of the world at large.

In the United States, there was a rapid, but not very successful, development of foreign banking during the War, owing to the fact that foreign, and especially English, institutions were so seriously crippled, and hence so little able to take care of the necessities of foreign trade. As a result, the United States enjoyed an unequalled opportunity for the development of its foreign banking system and business, but it never succeeded in gaining a strong foothold; and after the reaction of 1920-21 when foreign trade showed such extensive and serious net losses, there began a movement to disestablish foreign banks which, numerically speaking, went very much further than in any other country, while at the same time the serious losses, which had to be recognized and written off as a result of the shrinkage of prices, became very pronounced. This, taken in conjunction with the readjustment of foreign trade, was perhaps the most striking economic-financial development of the entire post-war period in the business and credit world. During the years 1921-28 the United States passed through a period of bank

# FINANCIAL STATISTICS OF PRINCIPAL FOREIGN COUNTRIES

ENGLAND  
(In millions of pounds)

	Dec. 1922	Apr. 1929
Bank of England:		
Gold and silver, coin and bullion	154	156.5
Bank notes in circulation <sup>a</sup>	104	857.3
Currency notes and certificates	301	...
Total deposits	133	112.4
Nine London clearing banks:		
Money at call and short notice	106	143
Discounts and advances	1,080	1,178
Investments	380	244
Total deposits	1,684	1,743
Total clearings	2,769	3,667
Government floating debt:		
Treasury bills	719	700
Temporary advances	222	37
Total floating debt	941	737

<sup>a</sup> Less notes in currency note account.

ITALY  
(In millions of lire)

	Nov. 1922	Apr. 1929
Banks of issue:		
Gold reserve	1,186	5,125
Total reserve	2,089	10,256
Loans and discounts	9,082	5,523
Note circulation for commerce	9,782	16,274
Note circulation for the state	8,075	...
Total deposits	2,638	2,144
Leading private banks: <sup>a</sup>		
Cash	781	1,163
Loans and discounts <sup>b</sup>	8,659	8,938
Due from correspondents	3,568	5,091
Participations	339	...
Total deposits	11,960	3,045

<sup>a</sup> Feb., 1929.

<sup>b</sup> Including treasury bills.

CANADA  
(In millions of dollars)

	Nov. 1922	Apr. 1929
Chartered banks:		
Gold coin and bullion <sup>a</sup>	92	62
Current loans and discounts	1,255	1,560
Money at call and short notice	303	560
Public and railway securities	817	524
Note circulation	170	189
Individual deposits	2,086	2,560
Gold reserve against Dominion notes	96	58
Dominion note circulation	251	205
Bank clearings <sup>b</sup>	1,619	1,961

<sup>a</sup> Not including gold held abroad.

<sup>b</sup> Total for month.

FRANCE  
(Amounts in millions of francs)

	Dec. 1922	Apr. 1929
Bank of France:		
Gold reserve <sup>a</sup>	3,670	35,788
Silver reserve	289	193
War advances to the Government	23,600	...
Note circulation	86,359	62,848
Total deposits	2,309	19,159
Clearings of Paris banks	18,794	36,643 <sup>b</sup>
Savings banks, excess of deposits (+) or withdrawals (-)	+ 33	+ 87 <sup>b</sup>
Price of 8 per cent perpetual rente	59.02	75.6 <sup>b</sup>

<sup>a</sup> Not including gold held abroad.

<sup>b</sup> Dec., 1928.

JAPAN  
(In millions of yen)

	Dec. 1922	Apr. 1929
Bank of Japan:		
Reserve for notes <sup>a</sup>	1,064	1,064
Loans and discounts	875	792
Advances on foreign bills	205	...
Note circulation	1,590	1,247
Government deposits	333	789
Private deposits	66	...
Tokyo banks:		
Cash on hand	169	263
Total loans	2,011	2,056
Total deposits	1,869	2,109
Total clearings	3,329	2,457

<sup>a</sup> Gold abroad, gold coin and bullion in Japan.

failure and bank amalgamation which greatly reduced the number of institutions.

**Banking, Prices, and Finance.** The problems of banking, prices, and finance had become unusually closely intertwined as a result of disturbance to revenue systems and to bank reserve holdings during the War and there was a disposition subsequent to the struggle to treat the whole situation as essentially a large problem of public concern in which a restoration to soundness could be brought about only through the direct invocation of government assistance coupled with legislation. It was generally admitted that permanent recovery from the effects of war finance and restoration of stability in currency would involve certain standardized and fairly definite elements. Conspicuous among these was the restoration of a budgetary balance designed to bring about freedom for the central banks from constant demands on the part of government short-term borrowing. At the same time the necessity of bringing about, so far as possible, a uniform condition of the monetary standard in all countries trading with one another was recognized. It was thought that this might not necessitate the actual redistribution of gold coin, opinions differing as to the advisability of such a step, pending the time of full restoration of commercial and economic soundness; but it did imply the restoration of currency and banking convertibility into foreign standards of recognized stability and strength and in so doing it rendered the international monetary problem practically a uniform matter subject only to variations of local attitude growing out of the varying amounts of specie that were held, the varying conditions of public debt, budgetary balance, and the like. Finally, it was recognized that in some way it would be necessary to bring about a scaling down or cancellation of international indebtedness on a fairly large scale, since without such cancellation, it would be practically impossible to develop a situation in which the various countries could meet their foreign obligations and provide the interest essential to keeping them alive. The process of carrying out these changes made considerable advance during the period after the War and by 1928 had resulted in the restoration of at least temporarily stable conditions throughout western Europe and in other parts of the world; but the equilibrium remained uncertain and the overhanging problem of German reparations had not been settled.

Not only budgets but international debt and exchange conditions, as well as the distribution of specie among the several countries, were thus (in 1928) still in a transitional condition in which the development of stability or a return of soundness must depend upon measures yet to be taken, some of them of an international nature.

**Bibliography.** The principal sources of information of war finance are contained in the financial reports of the various countries. For the United States, the reports of the Secretary of the Treasury and the annual reports of the Federal Reserve Board give the most complete and authentic information. The League of Nations has published a series of documents which deal at great length with public finances during the War. Volume IV is perhaps the most useful of these publications. The following works also are of service in this same connection:

Bogart's *Direct and Indirect Costs of the Great World War*; Anderson, *Effects of the War on Money, Credit, and Banking in France and the United States*; Gottlieb, L. R., *Financial Status of the Belligerents and Post-war Finance* (a series of four monographs issued by the Bankers' Statistics Corporation, New York, 1920-21); Benson, *State Credit and Banking during the War and After*; Seligman, *Currency Inflation and Public Debts* (Equitable Trust Company, New York, 1922); Hollander, *War Borrowing*. Fisk, *Internally Debts* (New York, 1924); *Reports of the National Monetary Commission* (Washington, 1910-II); *Reports of the Comptroller of the Currency*; Smith, *Trust Companies* (New York, 1928); Willis and Beekhart, *Foreign Banking Systems* (New York, 1929); Lawrence, *Stabilization of Prices* (New York, 1927); *Currencies After the War* (London, 1920); Cassel, *Money and Foreign Exchange after 1914* (London 1922); Schacht, *The Stabilization of the Mark* (London, 1927). See **TARIFF**; **TAXATION**; **AGRICULTURAL CREDIT**, etc.; also paragraphs on *Finance* in articles on countries.

**FINLAND.** Formerly a grand duchy of the Russian Empire, but since Dec. 9, 1917, an independent republic, situated in the northeastern part of Europe on the gulfs of Finland and Bothnia. Area, 149,608 square miles, of which 17,100 square miles are under water; population estimate of Dec. 31, 1927, 3,582,406, as against 3,364,807 in 1920. The 1920 count was a gain (for the same area) of 224,399 over the last decennial period, or 7.2 per cent. In 1927 the rural population numbered 2,962,000. Racially, in 1920 the population was divided into Finns, 88.7 per cent; Swedes, 11 per cent; Russians, 1 per cent; Germans, 0.8 per cent; Lapps, 0.5 per cent. The national church is Evangelical Lutheran, but liberty of conscience is guaranteed. At the end of 1926, there were 3,452,933 Lutherans, 60,071 Greek Catholics and Raskolnics, 655 Roman Catholics, 2178 Methodists, 3896 Baptists, and 1715 Jews. During 1916-20, inclusive, emigrants numbered 16,678 of whom 16,597 went to America. In 1926 emigrants numbered 6043. The principal towns, with their populations in 1910 and 1927, were: Helsinki, the capital, 221,000 (1910, 147,218); Abo, 63,000 (1910, 49,691); Tammerfors, 53,000 (1910, 45,442); Viborg, 50,000 (1910, 27,508).

**Agriculture.** Of the total area of Finland, 5,293,000 acres were devoted to crops in 1926; 2,931,000 acres to permanent meadows and pasture; 15,000 acres to trees, shrubs, and bushes; and 76,672,000 acres were woods, forests, and uncultivated land. In 1927 there were 1,871,865 cattle, 417,723 swine, 1,368,173 sheep, 395,968 horses, and 70,000 reindeer. The following table gives comparative statistics on acreage and production for 1909-13 and 1927:

Crop	Area (thousands of acres)		Production (thousands of units—bushels except as indicated)	
	1909-1913	1927	1909-1913	1927
Wheat	8	39	136	813
Rye	589	568	10,478	11,468
Barley	278	274	4,804	5,576
Oats	999	1,095	24,752	37,113
Potatoes	182	172	16,716	22,947
Flax and hemp	...	14	4,244 <sup>a</sup>	...
Hay	...	2,163	1,066 <sup>b</sup>	2,998 <sup>b</sup>

<sup>a</sup> Unit, pound of fibre.

<sup>b</sup> Unit, metric ton.

The country's chief wealth is in its forests and its water power. The forests of pine, spruce, and birch cover more than half the country, and the state forests alone include 33 per cent of the country's area. These yield a considerable revenue. In 1913, wood and wood products (including pulp and paper) formed 75 per cent of the exports of the country. By 1921 these had increased to 79 per cent and in 1927, to 80.5 per cent. It is estimated that there is 1,800,000 horse power available in Finland's water courses, but these as yet have been tapped only slightly, as is indicated by the fact that only 220,000 horse power was in use in 1926.

**Mining.** Mineral resources are still inconsiderable for want of capital, copper ore, magnetite, iron, and pyrite being mined only in small quantities. In 1923 considerable deposits of kaolin, which were available for the manufacture of porcelain and paper, were discovered near Wartsila.

**Manufacturing.** During 1927 the Finnish manufacturing industry was more active than ever before, registering new peaks for production values. The gross value of production, estimated at \$284,800,000, was nearly 3 per cent higher than in 1926. The net value of production, \$132,300,000, was 4 per cent higher. In 1926 the total value of industrial production (\$275,566,000) included the following: Wood, \$71,154,000; paper, \$52,628,000; foodstuffs and tobacco, \$49,329,000; textiles, \$26,248,000. There were 149,367 workers engaged in industrial occupations, more than one-third being employed in the wood and lumber industry.

**Commerce.** Imports and exports for typical years (based on the American dollar) were:

Year	Imports	Exports
1913	\$ 96,600,000	\$ 78,100,000
1918	63,076,500	28,355,400
1920	125,051,000	100,911,100
1922	84,700,000	95,600,000
1923	128,010,000	117,070,000
1927	160,924,000	159,328,000

The year 1922 was the first in the annals of Finland to show an excess of exports (13 per cent). In 1913, the excess of imports had been 22 per cent while for pre-war years the import excess had ranged from 15 to 40 per cent. On the basis of 1913 prices, exports in 1922 were 93.4 per cent of those in 1913 and imports were 74.4 per cent of those in 1913. Nothing can indicate more plainly than these figures how rapidly Finland was approaching its normal status. Principal imports were in the order of value: Textiles; cereals; coffee, tea, sugar; metals; machinery; oils and fats. Principal exports in the order of value were: Timber; pulp and paper; animal products, mostly butter; hides and leather; animals; matches; gums, tar, etc. In 1913 the following countries figured in goods sent into Finland, in the order of importance: Germany, Russia, Great Britain, Denmark, Sweden, Holland, Belgium. The United States was fifteenth, with \$712. In 1927 the order was: Germany (32.6 per cent), United States (15.4), United Kingdom (14.2), and Sweden (8.2). In 1913 the following were countries of destination of Finnish exports, by order of value: Russia, Great Britain, Germany, France, Holland, Belgium, Sweden, Denmark. Nothing was reported for the United States. In 1927 the order was: Great Britain (40.4 per cent), Germany (15.7), Netherlands (9.0), Belgium (6.0), United States (5.4).

**Communications.** In 1911 there were 2332 miles of railway; in 1927 the mileage was 3161, all but 186 miles of which belonged to the state. In 1926 there were 2811 post offices, 8758 miles of telegraph, and 114,057 miles of telephone wires. In 1913, 11,901 vessels entered Finnish ports, with cargo of 1,608,000 tons, in ballast 2,028,000 tons; 11,937 vessels cleared, with cargo 3,374,000 tons, in ballast 255,000 tons. In 1926 a total of 7482 vessels entered, with cargo 1,767,000 tons, in ballast 2,256,000 tons; 7536 vessels cleared, with cargo 3,828,000 tons, in ballast 293,000 tons. In 1927 the Merchant Marine consisted of 342 vessels with a capacity of 241,355 gross tons. About 166,076 tons were steam and 75,279 tons were sailing vessels.

**Finance.** On Dec. 31, 1927, there were 1,514,407,000 marks of the Bank of Finland in circulation. In 1914 there were 141,724,000 marks or \$27,352,732. Revenues in 1914 totaled 169,692,000 marks (\$32,777,556); in 1921, 2,887,179,000 marks (\$44,260,000); in 1929, 4,206,200,000. Expenditures in 1914 were 185,987,000 (\$35,895,491); in 1921, 2,698,135,000 (\$51,887,211); in 1929, 4,232,300,000 (\$106,654,000). In 1914 the total debt was 171,186,038 marks (\$33,038,905). At the end of 1927, it was \$91,400,000, at current rates of exchange, including \$79,000,000 of foreign debt and \$12,400,000 of internal debt. On July 31, 1929, it was 29,255,076,500 marks, consisting of 2,579,961,000 foreign consolidated debt and 345,115,400 marks internal consolidated debt. On Jan. 1, 1926, the Finnish mark was stabilized at \$0.0252.

**Education.** In 1928 there were three universities, the Swedish University at Abo being opened in 1919 and the Finnish University at Abo in 1922. There was a total of 4120 students. For secondary education, there were in 1926, 116 lyceums, 65 middle schools, 51 high schools for the people, with a total student body of 47,388. There were in all (1926) 9277 elementary schools with 620,452 pupils. Besides, the educational system included schools for the teaching of navigation, commerce, arts and crafts, agriculture, forestry, etc. In 1926 there were 370 newspapers and reviews in Finnish, 91 in Swedish, 50 in Finnish and Swedish, and 5 in other languages.

**Defense.** The army and coast defense are recruited on the basis of universal service. In 1927 the effectives included 2080 officers and 26,205 men. An integral part of the defense is the voluntary Civic Protective Guards Organization, which in 1927 numbered about 100,000. By 1929 Finland had no battleships. The army and navy budget for 1928 amounted to 423,000,000 marks.

**History.** The World War brought Finland relief from the Russification policy which had been carried on with increasing intensity during the decade preceding the outbreak of hostilities. Although the Finns in 1914-17 received no new political liberties, industrial growth, especially in the making of war materials, was considerable. The cities thus grew affluent while the countryside declined. It could not be said that the Finns hoped ardently for a Russian victory, for enlistments were surprisingly few. Yet the Russian Revolution of March, 1917, was hailed with mixed feelings. The bourgeois classes feared the dominance of the workers, much increased in number as they were by the expansion of industry and impregnated with revolutionary ideas by accessions from Russia. One of the

first steps of the Kerensky government was to restore representative government to Finland. When the Diet met on Apr. 5, 1917, the Social Democrats were in control. Strikes, a threatened famine, and altercations with Russia induced by efforts of the radicals for the Finnish independence featured the year 1917.

In the new Diet, elected Oct. 2, 1917 a bourgeois bloc forced out the Social Democrats and issued a declaration of independence on December 5. The Bolshevik government assented, on Jan. 9, 1918, and Finland was recognized by Sweden, Norway, France, Spain, Denmark, and Germany. The following year was a tragic one. "White Guards" and "Red Guards" appeared and war broke out everywhere, beginning with the seizure of Helsingfors in January, 1918, by the "Red Guards," the establishment of a soldiers' and workers' council, and the inauguration of a Red Terror. The government appealed for aid to Sweden, which declined to interfere, and to Germany, which quickly responded by signing a treaty with Finland on Mar. 7, 1918, which practically made Finland a German vassal, and by sending troops under General von der Goltz to take the Red Forces in the rear. Victories by von der Goltz and General Mannerheim, leader of the "White Guards," immediately followed; Helsingfors was retaken; and by May, 1918, the revolution was crushed. The White Terror then inaugurated accounted for 15,000 to 20,000 victims, and almost 100,000 men and women were thrown into jail.

The German-controlled dictatorship of Senator Svinhufvud which followed attempted to erect a monarchy under a German prince, Frederick Charles of Hesse, but these and other plans were frustrated when the German Armies collapsed on the western front. In December, the pro-German, Svinhufvud, resigned and Mannerheim, whose sympathies were monarchistic, was installed as Regent. In 1919 he tried to bring Finland into the Murmansk campaign, but the country's interest was now entirely absorbed by internal problems. The Diet of Mar. 1, 1919, organized by a bloc of the Progressive-Agrarian parties (though the Social Democrats had a plurality), decided for a republic, and on July 25, Prof. Kaarlo Juho Stahlberg was elected first President, over General Mannerheim, for a six-year term.

Finland was admitted to the League of Nations on Dec. 16, 1920. By the Treaty of Dorpat, Oct. 14, 1920, Finland received from Russia the Pechenga region on the Arctic Ocean which is especially desirable because the Gulf Stream keeps it open to winter navigation. Eastern Karelia, on the other hand, was granted autonomy under Russia. A dispute over a local uprising in Karelia in 1921 brought a state of ruffled feelings between Finland and Russia which lasted some years in spite of the efforts of the League of Nations to compose the differences. Another noteworthy controversy was that over the Åland Islands, claimed by Sweden on ethnological grounds and by Finland because of their strategic location at the entrance to the gulfs of Bothnia and Finland. The matter was referred to the League of Nations in June, 1920, and a year later the islands were granted to Finland. See ÅLAND ISLANDS.

Under the moderate Agrarian-Progressive coalition which continued in power after the election of 1922, the country made rapid strides toward regaining its stability and earned thereby the

approbation of European powers and the United States. In the latter part of 1923, however, a crisis was precipitated through the arrest of 25 Communist members of the Diet and the suppression of the Communist Party. On Jan. 16, 1924, the cabinet resigned and a new "cabinet of officials" was formed by Professor Cajander to act until elections could be held. Elections of April 1-2 reduced the Communist delegation from 27 to 18, with lesser changes in the other parties, the new representation being: Coalition Party, 38; Swedish People's Party, 23; Farmers' League, 44; National Progressives, 17; Social Democrats, 60; Communists, 18. On June 1, a bourgeois ministry was formed by Professor Lauri Ingman, and in November, the Cabinet was reconstructed with Professor Ingman remaining as Premier. In January, 1925, an Electoral College of 300 was elected to choose a new President of the Republic. It selected Dr. Lauri Kristian Relander, a conservative, giving him 172 votes, to 109 for the opposing candidate. He was inaugurated on March 1.

On January 16, a notable conference of the Foreign Ministers of Finland, Estonia, Poland, and Latvia met in Helsingfors for the discussion of problems of mutual concern. They agreed upon various cooperative policies relating to travel, commerce, etc., and upon a plan for obligatory arbitration of disputes arising among themselves. On an electoral reform issue, the ministry was forced out in March and was succeeded by a Coalition-Agrarian cabinet headed by Professor Antti Tulenheimo; but the new government lacked support and on December 10 it resigned. M. Kallio, leader of the Agrarians, became Prime Minister at the head of a cabinet of Agrarians and Coalitionists on the last day of the year. Without accomplishing any legislative measures of importance, the Government retained office for nearly a year, giving way in December, 1926, to a Socialist government, with Vaino Tanner as Premier, which was maintained in power by Progressive and Swedish support.

In April, by a close vote, it put through an amnesties measure to release political prisoners serving sentences for participating in the 1918 revolutionary movement. As the three-year life of the Diet came to a close in 1927, general elections were held in July, resulting in a gain of eight seats by the Agrarians and the loss of four by the Coalition Party and of seven by the Progressives. The new distribution was as follows: Social Democrats, 60; Swedish Party, 24; Coalition party, 34; Agrarians, 52; Progressives, 10; Communists, 20. The Socialist cabinet held office until December 9, when it resigned and was succeeded on December 17 by an Agrarian cabinet formed by Dr. Juho Sunila. Its span of life was likewise limited to one year, as a close non-confidence vote brought about its resignation Dec. 13, 1928. Dr. Oskari Mantere, of the National Progressive Party, became Premier, filling the cabinet positions with members of his own party and of the Coalition Party and with nonpartisans.

While this period was marked by few events of note, the various ministries wrestled continuously with the two major problems of Communism and prohibition enforcement. In February, 1928, the Finnish Diet tightened the prohibition laws by a series of amendments, and in April, wholesale arrests of Communists were made on charges of conspiracy. Most of the accused were later sentenced to varying terms in

prison. During 1928 an economic depression prevailed, due in part to overspeculation in industry and building. On Apr. 19, 1929, President Relander dissolved the Diet when it failed to support a government bill raising the salaries of government employees. Elections were set for July 1.

In foreign affairs, Finland for the most part enjoyed peaceful and harmonious relations with other nations. In 1924 treaties were signed with Norway and Italy relating to frontiers and trade, respectively, and in 1923 and 1926 trade and arbitration treaties were concluded with Norway, Sweden, Denmark, Hungary, Poland, Latvia, Spain, and the United States. On Sept. 15, 1927, Finland was elected to a non-permanent seat on the Council of the League of Nations.

**FINLAY, ROBERT BANNATYNE, FIRST VISCOUNT OF NAIRN (1842- )**. A British jurist, who was educated in medicine and law at Edinburgh Academy and University. He was a member of Parliament (1885-92, 1895-1906, 1910-16); Solicitor General (1895-1900); Lord Rector of Edinburgh University (1902-03); Attorney General (1900-06); Lord Chancellor (1916-18); British member of the Permanent Court of Arbitration at the Hague (1920- ); and a judge of the Permanent Court of International Justice (1921- ). He was created a knight in 1895, baron in 1910 and viscount in 1919.

**FINLEY, JOHN HUSTON (1863- )**. An American educator and editor (see VOL. VIII). He was a member of the American Army Educational Commission (1918), commander of the American Red Cross for Palestine and the Near East (1918-19), and resigned "as New York State Commissioner of Education in 1921 to become an editor of the New York Times. He served as chairman of the Committee on International Justice and Goodwill of the Federal Council of Churches of Christ in America, 1921-25. In 1923 he was appointed exchange lecturer to Scandinavian countries under the auspices of the Scandinavian-American Foundation. Among his later works are *French Schools in War Times* (1917), *A Pilgrim in Palestine* (1918), and *The Debt Eternal* (1923).

**FIORÉ, fyō'rá, PASQUALE (1837-1914)**. An Italian jurist (see VOL. VIII). *Il Diritto Civile Italiano Secondo la Dottrina e la Giurisprudenza* (2 vols., 1918), which he edited, was completed by Professor Biagio Brugi. *International Law Codified and its Legal Sanction* was translated into English in 1918, and new and revised editions of his more important earlier works were published after his death. Consult "Die Stellung des Menschen im Völkerrecht nach der Theorie Pasquale Fiores," in VOL. XIX of *Volksbildung*, by Josef Müller (1921).

**FIRE PROTECTION.** It is a somewhat striking commentary on the progress of civilization that, with the various means of safeguarding life and property, the losses due to fire in the United States and Canada have increased rather than diminished in the period after 1914, though beginning with 1926 some improvement in this respect is to be recorded. In fact, the annual destruction by fire and conflagration fairly could be compared with that of the World War (in 1927 alone it was estimated that some 10,000 lives were lost by fire), yet it has been impossible to arouse adequate public sentiment to deal effectively with this great menace. That this is necessary may be inferred from the fact

that 60 per cent of the fires in the United States are said to take place in homes and a majority of these unquestionably are due to carelessness. An annual property loss of nearly \$90,000,000 has been attributed to matches and smoking alone, a distinctly personal matter. However, along with improved building codes and inspection of premises both by municipal and outside agencies there were certain advances to be noted in securing more adequate fire protection, and there is a hopeful movement toward fire prevention which was becoming more general. A model arson law has been passed in a number of States and increased activity in securing convictions for arson was manifested.

In 1928 the fire loss as computed by the National Board of Fire Underwriters was the lowest since 1920. This was the first year since 1919 that the fire loss was not greater than in the year immediately preceding. From 1926 when the fire loss, the worst in the history of the United States, was estimated at \$561,980,751 or in excess of the San Francisco conflagration year of 1906 when it was \$518,611,800, the fire loss declined to \$478,245,620 in 1927, and \$472,224,568 in 1928. These figures represent the actual reported loss to which is added 25 per cent for unreported and uninsured damages and destruction. It was realized that much of the work of a municipal fire department should be in the field of fire protection and securing the enactment and enforcement of adequate regulations in the interests of public safety.

In 1928 the total estimated fire loss for the entire United States with a population of 120,013,000 was stated to be \$472,224,568, or a per capita of \$3.93, while for 445 cities with a population of 51,836,000, the total loss based on figures reported by fire departments was given as \$140,038,116 or a per-capita loss of \$2.70. While these statistics are only approximate, they may be compared with the record of the following cities: London, England, \$0.51 per capita; Edinburgh, Scotland, \$0.42 per capita; Bordeaux, France, \$0.75 per capita; Stuttgart, Germany, \$0.08 per capita; and Osaka, Japan, \$0.43 per capita. In 1928 there were 51 American cities in which the estimated loss, as reported by the Committee on Statistics and Origin of Fire of the National Board of Fire Underwriters, exceeded \$5 per capita, Fall River, Mass., heading the list with \$21.21 due to its conflagration of Feb. 2, 1928, followed by Freeport, Ill., with \$14.92.

The National Board of Fire Underwriters continue their inspection of municipal fire departments and water supplies, and from time to time have made valuable recommendations which were carried into effect and reacted to the benefit of the citizens by more favorable insurance rates. Since 1914 there has been the practical disappearance of horse-drawn fire apparatus in favor of motorized equipment which had reached a point where for speed and reliability, as well as for economy and capacity, it is able to function satisfactorily. By the elimination of the cost of maintenance for the food and care of the horses, it is possible to provide more adequate protection to the smaller cities and towns, and the increased speed of travel on the road and capability of achieving greater distances makes possible coöperative action by the fire departments of adjoining towns. In this connection, hose coupling, hydrant connections and other fittings have been made interchangeable conform-



ing to a common standard. In some of the larger cities, particularly those on the coasts, larger rivers, and the Great Lakes, independent high-pressure services were installed or extended and, with the tall buildings of modern construction, such independent high-pressure mains were considered absolutely essential.

In the fire departments themselves, it is interesting to note that along with the increase of technical interest and training (for example the Fire College of the New York Fire Department), there has been a marked advance in the spread of fire-prevention spirit and campaign. The old type of fire fighter whose method and pleasure apparently was the throwing of vast quantities of water seems to have passed. The reduction of the number of fire alarms rather than of the number of fires extinguished is beginning to mark the efficiency of a fire department and its chief, who is becoming both a public-conservation officer and an educator.

For the protection of water fronts, large and more powerful fire boats have been built with modern centrifugal and other pumps, and these are now valuable adjuncts to most of the large cities with warehouses, piers, and other harbor facilities, as their pumping facilities can be brought to bear also on fires not too far distant from the water front either through hose lines or permanent pipe systems. Not only on the Eastern coast of the United States but on the Pacific, such cities as Portland, Seattle, San Francisco, and Los Angeles have acquired large and powerful fire boats equipped with steam and gasoline engines and centrifugal pumps for fire protection on their shore fronts.

The seriousness of the annual fire loss has been appreciated by others than insurance authorities and municipal fire departments. The United States Chamber of Commerce through its Fire Waste Council has been cooperating with such agencies as the National Fire Protection Association and the National Board of Fire Underwriters. In 1928 there were nearly 700 chambers of commerce in the United States that were engaged in fire protection work and endeavoring to arouse the sentiment of their respective cities to the serious nature of the situation. Increased publicity was developed to this end and in many cities Fire Prevention Committees were organized and functioning in 1929. Clean-up and fire-prevention campaigns were being organized where civic pride as well as a proper appreciation of the fire hazard, was aroused. See INSURANCE: FORESTRY.

**FIRESTONE, HARVEY SAMUEL** (1868- ). An American rubber manufacturer, born in Columbiana Co., Ohio. He was president of a rubber company in Chicago while still in his twenties and in 1900 organized the Firestone Tire and Rubber Company at Akron, Ohio. That business developed rapidly with the growth of the automobile industry and within a few years established branches and subsidiary corporations in Canada and England. As president of the Rubber Association of America, Mr. Firestone organized its activities for the World War. In 1922 he campaigned against the British Crude Rubber Restriction Act. He investigated rubber-growing in the Philippines and in South America and has undertaken to develop twenty plantations for rubber production in Liberia, Africa, at an ultimate expenditure of \$100,000,000. He is the author of *Rubber—Its History and Development* (1922), and *Men and Rubber* (1926).

**FIRTH, SIR CHARLES HARDING** (1857- ). An English historian (see VOL. VIII). He was knighted in 1922 and became professor emeritus of modern history at Oxford in 1925.

**FISCHER, fish'ər, EUGEN** (1881- ). A German writer, born at Balingen, Württemberg, and educated at the University of Tübingen. After the World War, he was made press secretary of the Reichstag commission inquiring into pre-war history. He wrote *Der Kampf um Gott, Das Reich des Lebens*, an historical novel; *Woodrow Wilsons Entschluss*, political scenes; and *Kriegsschuldfrage und Aussenpolitik* (1923).

**FISCHER, MARTIN HENRY** (1879- ). A German-American physiologist and pathologist, born at Kiel, Germany. He came to the United States in 1885 and took a degree at Rush Medical College. He became full professor in the University of Cincinnati in 1910. He was known especially for his original research into the nature of nephritis and was instrumental in bringing the subject of focal infection before the German medical men; he also translated into English a number of German works on physical chemistry. He published *The Physiology of Alimentation* (1907), *Edema* (1910), *Nephritis* (1911), and translated Cohen's *Physical Chemistry* (1903), Pauli's *Physical Chemistry* (1906), Ostwald's *Handbook of Colloidal Chemistry* (1915), and Ostwald's *Introduction to Colloidal Chemistry* (1917).

**FISH, CARL RUSSELL** (1876- ). An American historian, born at Central Falls, R. I., and educated at Brown and Harvard universities. In 1900 he became professor of history at the University of Wisconsin, and was research associate at the Carnegie Institution in 1908-09 and director of the British branch of Historical Service, 1917-20. His works include *Development of American Nationality* (1913), *American Diplomacy* (1915), *The Path of Empire* (1919), *Guide to the Study of American Diplomacy* (1919), *History of America* (1925), *Rise of the Common Man* (1928), and many articles on educational and historical subjects.

**FISHERBERG, MAURICE** (1872- ). A Russian-American physician and anthropologist, born at Kamenetz-Podolsk, Russia. He took his medical degree at New York University in 1897 and became clinical professor of medicine at the New York University and Bellevue Hospital Medical College and chief physician to the Montefiore Home and Bedford Sanitarium. In 1897 he made a tour of Europe for the Bureau of Emigration. He is one of the leading authorities on tuberculosis. His major publications are *The Jew: a Study of Race and Environment* (1911); *Die Rassenmerkmale der Juden* (1913), and *A Treatise on Tuberculosis* (1916). He translated Gley's work on internal secretions from the French in 1917.

**FISHER, THE RT. HON. ANDREW** (1862-1928). An Australian statesman (see VOL. VIII). He was again Prime Minister of Australia in 1914-15 and was High Commissioner of Australia in England, 1916-21.

**FISHER, DOROTHY CANFIELD** (1879- ). An American author, born at Lawrence, Kan., and educated at the Ohio State University and at Columbia University. In 1907 she married John Redwood Fisher of New York, and in 1911-12 she and her husband went to Rome, where she made the acquaintance of Madame Montessori and helped translate her book about her pedagogical system. From this experience resulted her

own book, *A Montessori Mother* (1913), which was translated into five foreign languages. During the World War, Mrs. Fisher engaged in war work in France for three years. Her books include *The Squirrel Cage* (1912); *Mothers and Children* (1914), *The Bent Twig* (1915), *Hillsboro People* (1916), *The Real Motive* (1917), *Understood Betsy* (1917), *Home Fires in France* (1918), *The Day of Glory* (1919), *The Brimming Cup* (1921), *Rough-Hewn* (1922), *Raw Material* (1923), *The Homemaker* (1924), *Make-to-Order Stories* (1925), *Her Son's Wife* (1926), and *Why Stop Learning?* (1927). She translated Papini's *Life of Christ* (1921).

**FISHER, FRÉDÉRIC BOHN** (1882- ). An American Methodist Episcopal bishop, born at Greencastle, Pa., and educated at Asbury College (Wilmore, Ky.), Boston University, and Harvard University. He was ordained in the Methodist ministry in 1903 and in the next year went to India as a missionary, returning in 1906. From 1908 to 1910 he was pastor of the First Church in Boston and in 1910-20, served on the Board of Foreign Missions and in the Laymen's Missionary Movement. In 1920 he was elected bishop. He is the author of *The Way to Win* (1915), *Gifts from the Desert* (1916), *India's Silent Revolution*, in collaboration with Gertrude M. Williams (1919), *Garments of Power* (1920), and *Which Road Shall We Take?* (1923).

**FISHER, THE RT. HON. HERBERT ALBERT LAURENS** (1865- ). An English historian and educator (see Vol. VIII). He received honorary degrees from Cambridge (1920), and other universities. He was a member of the Royal Commission on the Public Services of India (1912-15), President of the Board of Education (1916-22), a member of Parliament for Sheffield (1916-18), and for the English Universities (1918-26), and a member of the British delegation to the League of Nations Assembly (1920-22). In 1920 he was made a Fellow of the Royal Society. In 1924 he gave the Lowell Lectures in Boston, Mass., which previously he delivered in 1909, and in the next year he became the Warden of New College, Oxford. He edited *The Modern World; a Survey of Historical Forces* in Baltimore (1920-27). His later works are *Studies in History and Politics* (1920); *International Experiment* (1921); *The Common Weal* (1924), *The Life of Lord Bryce* (1926), and *Sir Paul Vinogradoff; a Memoir* (1927).

**FISHER, IRVING** (1867- ). An American economist (see Vol. VIII). He was an officer of many organizations for the advancement of the public health. His later writings include *Why Is the Dollar Shrinking?* (1914); *How to Live*, with Dr. E. L. Fisk and others (1915); *Stabilizing the Dollar* (1919); *The Making of Index Numbers* (1922); *League or War?* (1923); *America's Interest in World Peace* (1924); *Prohibition at Its Worst* (1926); *Prohibition Still at Its Worst* (1928); and *The Money Illusion* (1928). His views on the means of insuring a stable medium of exchange were the subject of wide discussion.

**FISHER, LORD JOHN ARBUTHNOT** (1841-1920). A British admiral (see Vol. VIII). As First Sea Lord of the Admiralty during the first year of the World War, he supervised the reorganization and expansion of the British fleet and devised a plan for the invasion of the Baltic and the landing of an army within striking

distance of Berlin. He resigned in 1915 on the ground that the effort to force the Dardanelles was endangering the British margin of safety in the North Sea. In 1919 he published a volume, *Reminiscences*. He continued as Admiral of the Fleet until his death in London, July 10, 1920. He was buried in Westminster Abbey.

**FISHER, SYDNEY GEORGE** (1856-1927). An American lawyer and writer (see Vol. VIII). He wrote *American Education* (1917), *The Quaker Colonies* (1918), and many articles on nature study and out-of-door life.

**FISHER, WALTER KENRICK** (1878- ). An American zoölogist, born at Ossining, N. Y., and educated at Leland Stanford, Junior, University. He was special field naturalist for the United States Biological Survey (1897-1901); and assistant (1902-05), acting instructor (1905-07), instructor (1907-09), assistant professor (1909-20) associate professor (1920-25), and professor since 1925 at Stanford. Professor Fisher was director of the Hopkins Marine Laboratory (1917- ). His published work was largely on the echinoderms of the Pacific Ocean.

**FISHERIES.** A term of varied application but used here to designate organized governmental agencies which have to do with the collection of information concerning food supplies obtained from oceanic or inland waters and the application of this information to the problem of increasing or making these supplies more available to the citizens. In all countries where fishing industries are important, it has been the experience that there occur periods when there are noticeable decreases in the amount of these supplies to be obtained from the waters and this decrease is usually laid to injudicious fishing. As a result, a large part of the work of a fisheries bureau is to devise methods for increasing the supply, and legislation governing the methods to be employed in taking it.

In the United States, the Bureau of Fisheries (originally the United States Fish Commission but now a bureau under the Department of Commerce) has general supervision over the marine and fresh-water fisheries in United States territory as well as the fur seal, reindeer, and fox industries in Alaska. Under its control are four main laboratories; at Woods Hole, Mass.; Beaufort, N. C.; Key West, Fla.; and Fairport, Iowa. In all of these it has been the policy of the Bureau to encourage abstract scientific investigations, as well as researches having more immediate practical application. At the Woods Hole station formerly there were hatched each year large numbers of lobsters, which were set free in the neighboring waters; but as it seemed impossible to enlist the co-operation of the fishermen in the attempt to prevent the catching of the "short" or immature lobsters, the supply decreased so that it was difficult to get enough eggs for this work and it was discontinued in 1919.

Invention of machinery making commercially profitable the manufacture of buttons from the shells of fresh-water mussels led to the establishment of the laboratory at Fairport, where much attention has been given to the problem of the propagation of mussels and of the fishes upon which the young mussels are parasitic for a period during their immature stage, though in 1927-28 a technique was perfected for rearing

the larvæ in nutrient solutions and thus eliminate the parasite stage.

A large part of the work of the bureau consists of the collection of statistics relating to the fisheries (including the Alaska fur industries), and the reports of the commissioner, as well as the occasional *Statistical Bulletins*, should be consulted for this information, which is too varied and voluminous to be summarized here. These statistics cover not only data relating to fish properly so-called, but relate to a wide range of aquatic products covering oysters and clams, lobsters, shrimps and crabs, and sponges, as well as by-products such as whale and fish oil, shark and porpoise hides, agar-agar, shark fins, whale skeletons and oyster shells ground up for use as lime and poultry grits.

Much of the recent work of the bureau has been extended to cover determination of improved methods for merchandising fishery products, as well as the consideration of better preservation procedures in connection with canning and freezing, thus broadening the scope of its operations so as to include the final distribution of the products, as well as encouraging their increase.

In Alaska, the predominate fishery interests have been connected with the salmon, but halibut, herring, cod, and shrimps form an important part of the total catch. The taking of skins of the fur seals is now under strict supervision, it being decided annually how many should be taken. This has resulted in a desirable increase in the size of the herds and the establishment of the industry on a more durable basis.

According to the Report of the Commissioner for the year ending June 30, 1928, the United States (including Alaska) fisheries employ 118,600 commercial fishermen with 43,000 persons on transporting vessels, the value to the fishermen of annual landings of fisheries products being \$103,000,000. Seal skins to the value of \$721,152.50 and blue fox skins to the value of \$79,172.50, were sold during the year.

The *Conseil Permanent Internationale pour l'Exploration de la Mer* is a coöperative venture, composed of all European nations bordering on the North Sea. This was organized in 1901 and has continued since that time, though interrupted during the War. Their *Rapport Jubilee* published in 1927 gives an optimistic account of the work the *Conseil* has thus far accomplished, not only in increasing the value of the cod, herring, plaice, and eel fisheries, but in accumulating a large amount of hydrographic data as well. For details, the reports of the *Conseil* should be consulted.

**FISK, EUGENE LYMAN** (1867- ). An American physician and co-founder of the Life Extension Institute, born at Brooklyn, N. Y., and educated at the medical college of New York University. After serving as medical director of the Provident Savings Life Insurance Company and the Postal Life Insurance Company, he became the medical head of the Life Extension Institute in 1913. In collaboration (Fisher and Fiske) he wrote *How to Live* (1916) and *Health for Soldier and Sailor*. He is the author of *Alcohol: Its Relation to Efficiency and Longevity* (1917); *Health Building and Life Extension* (1923); and *How to Make the Periodic Health Examination* (1927).

**FISKE, BRADLEY ALLEN** (1854- ). An American naval officer, retired in 1916 (see Vol.

VIII). He was president of the U. S. Naval Institute (1911-23). He was awarded a gold medal by the Aero Club of America for the invention of the torpedoplane in 1919. His later writings include *The Navy as a Fighting Machine* (1917, 2d ed., 1918); *From Midshipman to Rear Admiral* (1919); *The Art of Fighting* (1920), and *Invention* (1921).

**FISKE, CHARLES** (1868- ). A Protestant Episcopal Bishop, born in New Brunswick, N. J., and graduated at St. Stephen's College, Annandale, N. Y. (A.B., 1893) and at the General Theological Seminary (B.D., 1896). Ordained in the Protestant Episcopal Church, he served parishes in New Jersey, Pennsylvania, and Baltimore, Md. In 1915 he was consecrated Bishop Coadjutor and in 1928 Bishop of Central New York. He is the author of *The Perils of Respectability*; *The Experiment of Faith*; *Back to Christ*; *The Faith by Which We Live*; *Sacrifice and Service*; *The Religion of the Incarnation*; *The Christ We Know*; and *Confessions of a Puzzled Parson*.

**FISKE, HALEY** (1852-1929). An American insurance official and expert, who was born at New Brunswick, N. J., and educated at Rutgers College (A.B., 1871). He studied law and was admitted to the bar in New York City, where he practiced until 1891. Becoming a vice president of the Metropolitan Life Insurance Company in that year, he was elected president in 1919 and remained at the head of the company until his death. He inaugurated various policies that developed his company as a social institution and an important agency in public-health campaigns throughout the country. He was a leading layman of the ritualistic wing of the Protestant Episcopal Church and a trustee of and liberal giver to the Cathedral of St. John the Divine and other church enterprises.

**FISK UNIVERSITY**. A coeducational institution for Negroes of Nashville, Tenn., founded in 1868. Dormitory limitations prevented much variation in attendance, which was 516 in 1914, and 503 in 1928-29, with an additional 82 in the music school. The faculty in 1928 numbered 35 members and there were 24 administrative officers and assistants. For its rigid emphasis on high standards in all departments, the University was aided during the period 1914 to 1928 by the General Education Board, the Carnegie Foundation, the Carnegie Corporation, the Phelps-Stokes Fund, the Slater Fund, the American Missionary Association, the Harmon Foundation, and the Juillard Musical Foundation. Fisk received, chiefly from the General Education Board and the Carnegie Corporation, the sum of \$150,000 in 1917; and in 1920 the General Education Board offered \$500,000 on condition that the University raise \$1,000,000. Thomas Elsa Jones, Ph.D., was inaugurated as president in 1926, at ceremonies attended by representatives of numerous leading educational institutions, among whom were President James R. Angell of Yale, who delivered the principal address, and Chancellor Kirkland, of Vanderbilt University.

**FITCH, ALBERT PARKER** (1877- ). An American educator, born in Boston, and educated at Harvard University and Union Theological Seminary. He was ordained in the Congregational ministry in 1903, subsequently holding various pastorates, and becoming president of Andover Theological Seminary at Cambridge in 1909. In 1917, he resigned to accept the profes-

sorship of the history of religion at Amherst College, where he was one of those who withdrew from the faculty on the resignation of President Meiklejohn in 1923. He held a professorship at Carleton College, Northfield, Minn., 1924-27, and since 1929 has been minister of the Park Ave. Presbyterian Church, New York City. He is the author of *The College Course and the Preparation for Life* (1914), *Religion and the Undergraduate, Can the Church Survive the Changing Order?* (1920), and *Preaching and Paganism* (1920).

**FITE, WILLIAM BENJAMIN** (1869- ). An American educator, born in Marion, Ohio. He studied at Hillsdale College and took postgraduate work at Cornell. After teaching mathematics in the Academy, he served on the faculty of Cornell as instructor and assistant professor in mathematics until 1910, when he was appointed professor of mathematics at Columbia. He wrote *College Algebra* and *First and Second Courses in Algebra*.

**FITZGERALD, FRANCIS SCOTT** (KEY) (1890- ). An American author, born at St. Paul, Minn. He left Princeton University in 1917 to join the American forces in the World War and served as aide-de-camp to Brig. Gen. John F. O'Ryan (1918-19). Written with refreshing verve and promising talent, his books on the younger generation include *This Side of Paradise* (1920), *Flappers and Philosophers* (1920), *The Beautiful and the Damned* (1921), *Tales of the Jazz Age* (1922), *The Great Gatsby* (1925), *All the Sad Young Men* (1926), and a play, *The Vegetable* (1923).

**FITZGERALD, JOHN DRISCOLL II.** (1873- ). An American philologist and publicist (see VOL. VIII). He was professor of Spanish at the University of Illinois from 1915 to 1925, when he became professor of Romance philology there. In 1922-23 he was visiting professor at the University of Madrid and the Centro de Estudios Históricos. He has been editor of *The Hispanic Series* since 1916, and consulting editor of *Hispania* since 1919. Among his recent publications are a translation (with Thacher Howland Guild) of *A New Drama*, by Manuel Tamayo y Baus (New York, 1915); *Apuntes sobre Literatura Americana* (Madrid, 1924); and *Relaciones Hispano-Americanas* (Madrid, 1925).

**FITZMAURICE-KELLY, JAMES** (1857-1923). An English writer and Spanish scholar (see VOL. VIII). He was professor of Spanish language and literature at the University of Liverpool (1909-16), and at the University of London (1916-23). Among his later works are *Cervantes and Shakespeare* (1916); *Góngora* (1918); *Fray Luis de León* (1921); and *Spanish Literature Primer* (1922). He edited the Romance section of the *Modern Language Review* (1913-20), *Samaniego's Fábulas en verso* (1917), *Iriarte's Fábulas Literarias* (1917), *Garcilaso de la Vega's Eglogas* (1918), *Poesías varias* (1918), *Complete Works of Miguel de Cervantes Saavedra*, and *Cambridge Readings in Spanish Literature* (1920). He also contributed to the *Cambridge Modern History*.

**FITZPATRICK, EDWARD AUGUSTUS** (1884- ). American educator and author, born in New York, and educated at the New York Training School for Teachers and Columbia University. He taught in New York and in 1919 he became secretary of the State Board of Education in Wisconsin. He conducted a seminar on public

educational administration at the University of Wisconsin 1919-23. Since 1924 he has been dean of the graduate school of Marquette University, Milwaukee, Wis., and editor of *Hospital Progress*. He has published *Educational Views and Influence of De Witt Clinton* (1911), *Budget-making in a Democracy* (1918), "Public Administration and the Public Welfare" in *Freedman's America and the New Era* (1920), *The Scholarship of Teachers in Secondary Schools* (1927), *Industrial Citizenship* (1927), *Wisconsin* (1927).

**FITZROY, RT. HON. EDWARD ALGERNON** (1869- ). An English soldier and member of Parliament, son of Baron Southampton. He was educated at Eton and Sandhurst, and attained to the rank of captain in the army. Although nearly fifty, he served throughout the World War, being wounded at the first battle of Ypres. His political career began in 1900 when he entered Parliament as a Conservative. He has since served continuously except for the years, 1906-10. In 1922 he became deputy chairman of committees and in 1924, Privy Councillor. In June, 1928 he was elected Speaker of the House of Commons.

**FIUME-ADRIATIC CONTROVERSY.** The drawing of the boundary line between Italy and Yugoslavia was perhaps the most difficult problem before the Peace Conference in 1919, and continued to be a cause for dissension in Europe long after the peace treaties were signed. The territories in dispute were: Gorizia and Gradisca, Trieste, Istria, Dalmatia (all former parts of Austria), and Fiume (formerly belonging to Hungary). These lands, in the main, are separated from Yugoslavia by chains of mountains; in climate, economic, and cultural activities, with some exceptions, their orientation is plainly toward the West. While the Slavs made up the majority of the population, the Italians predominated in many of the towns and it was for sentimental, historical, and strategic, as well as economic, reasons that Italian aspirations envisaged the acquisition of these territories. By the secret Treaty of London (Apr. 26, 1915), Italy gained the promise of Allied support to an Italian frontier which included Gorizia, Trieste, Istria, Northern Dalmatia, and some islands to the south; Fiume was to remain in Croatia, on the supposition, evidently, that it was to continue to form a part of Hungary. On Oct. 29, 1918, Italian troops, at the behest of the Fiumani, occupied the town. The Allies, in their turn, protested on the ground that Fiume had not been assigned to Italy, with the result that an inter-Allied army took possession. The course of events before the Peace Conference was characterized by a bitter struggle that terminated in a deadlock. The Italians took their stand on the Treaty of London line, claiming Fiume as well on the ground that the dissolution of the Austro-Hungarian Monarchy had entirely changed the situation. The Yugoslavs found a champion in President Wilson, who stubbornly contested the Italian claims on the eastern boundary and supported a frontier which ran on the north along the London line to Tarvis and then dipped south along the centre of the Istrian peninsula. Fiume was to be internationalized though left within the Yugoslav customs union. (This was the well-known "Wilson Line" presented Apr. 14, 1919.) That the Italians should be embittered was natural: they had entered the War largely as a result of the Treaty of London; they had the support

of their allies in their claims; they demanded the territories for important strategic and cultural reasons. The failure to reach a compromise prompted President Wilson to issue his famous appeal of April 23 to the Italian people over the heads of their delegation. (See **PEACE CONFERENCE AND TREATIES**.) But the statement acted as a boomerang, for instead of winning over the Italian people, it completely estranged them, with the result that Orlando's government, on June 19, was defeated in the Italian Parliament. All chances for a settlement, at least as far as the Peace Conference was concerned, had thus disappeared. It was no wonder, therefore, that when on September 12 the poet-militarist D'Annunzio, at the head of a band of volunteers and Italian regulars, marched into Fiume, his *coup de main* should be received with such exuberant Italian approval. The Supreme Council was spurred into action and during the next few months concerned itself with various programmes. The scheme proposed on Dec. 9, 1919, called for the creation of a Fiume buffer state (for by this time Italy had dropped Dalmatia), which Italy, however, refused to support; a subsequent combined Italian-English-French proposal, Jan. 14, 1920, called for the assignment of Fiume to Italy with League control of its port and terminal connections, but to this both Jugoslavs and Wilson objected. Thenceforth, the struggle became localized, and with the withdrawal of the United States from world affairs, the declining interest of Great Britain and France in the Adriatic, and the imminent defeat of the Democratic Party in the American elections of 1920, it appeared evident to both disputants that only a spirit of conciliation would serve their best interests. In June, 1920, the Italians finally evacuated their last strongholds in Montenegro and Southern Dalmatia. On November 12, a treaty was signed by Italy and Yugoslavia at Rapallo which showed how much both had yielded. Italy was to annex part of Carniola and all Istria and push her frontier east to the confines of Fiume; Fiume was to be created an independent state, though Sušak was to go to Yugoslavia; Italian claims to Dalmatia (except Zara) and almost all the islands (excepting Cherso, Lussin, and Unie) were renounced. Ratifications were exchanged Feb. 2, 1921, and the vexing business seemed on the verge of settlement when it leaked out that the Italian government privately had promised to turn over Porto Barros, a portion of the Fiume port, to Yugoslavia. Again the Italian public was aroused and again Fiume became the bone of contention. Meanwhile, the D'Annunzio tangle had been straightened out. In December, he was ordered by the Italian government to evacuate the town, and on his refusal to do so, the signal was given to attack (December 24). Realizing the hopeless nature of his position, four days later he handed over his powers to the town council, and by Jan. 2, 1921, the Italian regulars were in control. D'Annunzio was ejected and steps were taken to establish the independent government provided for by the Treaty of Rapallo. Elections were held in April, 1921, for a Constituent Assembly, but the Italian Nationalists, being defeated, destroyed the returns, and violence again prevailed. The Fascisti, who had organized themselves in sympathy with Italian Fascism (see **ITALY**), seized the city government and established a Fascist Directory. Difficulties engendered in

Italian evacuation of the Northern Dalmatian zone necessitated the negotiation of the supplementary convention of Santa Margherita (October, 1922) between Italy and Yugoslavia, though even this did not much expedite matters, in particular as far as Fiume was concerned. In November, 1922, the Fascist government came into power in Italy and Mussolini at once indicated that it was his intention to hasten a settlement. Independent local government in Fiume had proved itself a failure, though this may have been due to the interference of the Fascisti; economic life also was completely disorganized. In 1923 Mussolini exchanged a series of notes with the Yugoslav government relative to the status of the disputed city. As his demands for revision of the Rapallo Treaty and assignment of Fiume to Italy were made in the peremptory style in which he had been accustomed to address the Italian Parliament, rather than with diplomatic suavity, the negotiations became increasingly acrimonious. When an Italian military force under General Giardini seized the city, a rupture of diplomatic relations and perhaps even graver consequences seemed imminent, but secret bargaining between Belgrade and Rome ultimately averted armed conflict. In January, 1924, it was announced that an agreement had been reached. The treaty, signed at Rome, three days later, ceded the city and port of Fiume to Italy, recognized Yugoslav sovereignty over Porto Barros, leased to Yugoslavia a port in the Fiume Harbor, and made the Fiume railway station an international frontier station. Additional conventions signed at the same time recognized Yugoslav sovereignty over Dalmatia and Italian sovereignty over Venetia Julia. See **PEACE CONFERENCE**.

**FIVE-POWER NAVAL TREATY.** See **WASHINGTON CONFERENCE, AND NAVIES OF THE WORLD**.

**FIXATION OF NITROGEN.** See **CHEMISTRY, AND FERTILIZERS**.

**FLAMMARION, flá'má'ré'ón', CAMILLE (1842-1925).** A French astronomer (see **VOL. VIII**). Among his later writings were *Death and Its Mystery*, in three parts (1920, 1921, 1922), *Dreams of an Astronomer* (1923), and *Haunted Houses* (1924).

**FLANAGAN, JOHN (1865- ).** An American sculptor (see **VOL. VIII**). Although his work included such sculptures as the bronze memorial portrait of Samuel Pierpont Langley, Smithsonian Institution, and the Bulkley Memorial, Aetna Life Insurance Building, Hartford, he was active chiefly as a medalist, especially during the World War. He executed the "Médaille de Verdun," voted by Congress and presented to that city by President Harding. The fine realism of his portraiture and his subtle handling of lights and shadows made him preëminent in low relief. He won the Saltus Medal of the American Numismatic Society in 1921.

**FLANDERS, BATTLES IN.** See **WORLD WAR, under Western Front**.

**FLEG, EDMOND (1874- ).** A French writer. His works include the plays *Le Message* (1905); *Le Cloison* (1906); *Le Trouble-fête* (1913); *La Maison du Bon Dieu* (1920); and *Le Juf du Pape* (1925); the poems *Le Mur des pleureux* and *Le Psaume de la terre promise* (1919); *Écoute, Israël* (1921), and *Anthologie juive*, from early days to the present (2 vols., 1923; trans. 1925); a French translation of the Hebrew text of *Haggada de Pessah* (1925);



*L'Enfant prophète*, fiction (3d ed., 1926), and *La Vie de Moïse* (1928; trans. as *The Life of Moses*, 1928). He edited *Judaïsme*, seven volumes appearing between 1925 and 1927.

**FLEMING, DANIEL JOHNSON** (1877- ). An American clergyman, born at Xenia, Ohio, and educated at Wooster University, Union Theological Seminary, and Columbia, Chicago, and Punjab universities. He was ordained in the Presbyterian ministry in 1903 and went to India in 1904 as professor of physics and director of Forman Christian College at Lahore. He remained there until 1913. In 1915 he was appointed organizing director of the department of foreign service at Union Theological Seminary, and in 1918, professor of missions. In 1919-20 he was a member of the International Commission on Indian Village Education. He is the author of *Social Study, Service, and Exhibits* (1913), *Devolution in Mission Administration* (1916), and *Marks of a World Christian* (1919). He collaborated in *Village Education in India* (1920), *Schools with a Message in India* (1921), *Building with India* (1922), *Contacts with Non-Christian Culture* (1923), and *Whither Bound in Missions* (1925).

**FLEMING, JOHN ADAM** (1877- ). An American magnetician, born in Cincinnati, Ohio. He graduated from the University of Cincinnati, 1899; from that year to 1910, was with the United States Coast and Geodetic Survey. He was chief magnetician of the Department of Terrestrial Magnetism at the Carnegie Institution (1904- ), chief of the Magnetic Survey Division, 1919-21, and assistant director since 1922. He wrote reports on terrestrial magnetism and other subjects for the Carnegie Institution and also contributed numerous articles to reviews and magazines.

**FLEMING, JOHN AMBROSE** (1849- ). A British electrical engineer (see VOL. VIII). He was professor of electrical engineering in University College, London (1885-1926). He invented the thermionic valve, revolutionizing wireless telegraphy, and was associated with the development of wireless telephony and other electrical inventions. His work earned for him the Albert Medal of the Royal Society of Arts (1921) and the Faraday Medal of the Institution of Electrical Engineers (1928). Among his later publications are *Fifty Years of Electricity* (1921); *Electrons, Electric Waves, and Wireless Telegraphy* (1923), and *The Interaction of Scientific Research and Electrical Engineering* (1927).

**FLEMING, WALTER LYNNWOOD** (1874- ). An American historian, born at Brundidge, Ala., and educated at the Alabama Polytechnic Institute and Columbia University. From 1903 to 1907, he was professor of history in West Virginia University, and from 1907 to 1917, in Louisiana State University. In the latter year, he was called to a similar position at Vanderbilt University in Nashville, Tenn., where he has been dean of the College of Arts and Science since 1923. He was one of the editors of the *Historians' History of the World* and edited Lester and Wilson's *History of the Ku Klux Klan* (1905), *Documentary History of the Reconstruction*, 2 vols. (1906, 1907), section six of *The South in the Building of the Nation*, 12 vols., and the *Mississippi Valley Historical Review*. He is the author of *Reconstruction of the Seceded States* (1905), *The Civil War and Reconstruction in Alabama* (1905), *William Tecumseh Sherman*

as *College President* (1912), *The Sequel of Apomattox* (1919), and *The Freedmen's Savings Bank* (1927).

**FLEMISH MOVEMENT.** See BELGIUM.

**FLERS, flâr, ROBERT DE LA MOTTE-ANGO, MARQUIS DE** (1872-1927). A French dramatist, born at Pont l'Évêque, and educated at the Lycée Condorcet in Paris, who devoted himself to drama both as author and critic. Among his theatrical works, which earned him a place in the French Academy (1920), the undisputed masterpiece was *Le Roi*, who was Edward VII of Great Britain, written with Caillavet and Arène. It combined the breeziness of a revue and the biting satire of Beaumarchais. His theatrical works written with Caillavet include *Le cœur a ses raisons; Les sentiers de la vertu; L'ange du foyer; Miquette et sa mère; La chance du mari; L'Amour veille; L'éventail; Le bois sacré; L'Âne de buridan; Papa; Primerose; L'Habit vert, and Monsieur Bretonneau*. With Etienne Rey, he wrote *La Belle Aventure*, and Caillavet collaborated with Flers in writing the operettas, *Les travaux d'Hercule; Le Sire de Vergy; Monsieur de la Palisse; Paris, ou le Bon Juge; Fortunio; Béatrice, and Ciboulette*, the music for them being by Claude Terrasse, André Messager, or Reynaldo Hahn. With Francis de Croisset, he wrote *Les nouveaux messieurs, Le retour, Les vignes du seigneur, and Le docteur miracle*. *L'Amour veille* and *Primerose* received the Toirac Prize of the French Academy. Among his critical and fictional works may be mentioned *Vers l'Orient*, crowned by the French Academy; *Entre cœur et chair; Essais de critique; Histoire de la Courtisane Tain, and La petite table*.

**FLESCH, CARL** (1873- ). An eminent Hungarian violinist (see VOL. VIII). In 1924 he was appointed head of the violin department of the Curtis Institute in Philadelphia, and the following year founded the Curtis String Quartet (with E. Zetlin, L. Bailly, and F. Salmou). Dividing his time between the United States and Germany, he accepted, in 1928, the post as head of the violin department at the Staatliche Hochschule für Musik in Berlin. He edited Kreutzer's and Paganini's studies, Mozart's violin sonatas and the concertos of Beethoven, Mendelssohn, Paganini, and Brahms, and wrote an excellent method: *Die Kunst des Violinspiels* (2 vols., 1923 and 1928).

**FLETCHER, DUNCAN UPSHAW** (1859- ). A United States Senator (see VOL. VIII). He was reelected to the Senate from Florida for the three terms, 1915-33. In that period, he was a member of the Senate Committees on Commerce and Banking and Currency and of the Joint Committee on Printing. He was also chairman of the U. S. Commission on Rural Credits.

**FLETCHER, FRANK FRIDAY** (1855-1928). An American naval officer (see VOL. VIII). He was promoted to the rank of admiral in March, 1915. He was a member of the War Industries Board in 1917 and the General Board of the Navy, and was awarded a medal of honor for distinguished conduct in battle. In 1925 he was made a member of the President's Air Craft Board.

**FLETCHER, HENRY PRATHER** (1873- ). An American diplomat, born at Greencastle, Pa., and educated at Chambersburg (Pa.) Academy. He was admitted to the bar in 1894 and served with the "Rough Riders" in the Spanish-American War. His diplomatic career

began in 1902 when he was secretary of the American Legation in Cuba. After diplomatic service in China, Portugal, Mexico, and South America, he resigned in 1920, and was under-Secretary of State from Mar. 8, 1921, to Mar. 6, 1922. On the latter date, he accepted the post of Ambassador to Belgium. He headed the United States delegation to the Fifth Pan-American Congress at Santiago, Chile, in 1923, and was a delegate to the Sixth Congress at Havana, Cuba, in 1928. From 1924 to August, 1929, he was Ambassador to Italy, resigning in the latter year. He was principal advisor to President Hoover on the latter's pre-inauguration tour of Latin-America in 1928-29.

**FLETCHER, JOHN GOULD** (1886- ). An American author born at Little Rock, Ark., and educated at Phillips Academy (Andover, Mass.) and Harvard. He later made England his home. He has written *Fire and Wine* (1913), *Irradiations—Sand and Spray* (1915), *Goblins and Pagodas* (1916), *Japanese Prints* (1918), *The Tree of Life* (1918), *Breakers and Granite* (1921), and *Paul Gauguin, His Life and Art* (1921), *Preludes and Symphonies* (1922), *Parables* (1925), *Branches of Adam* (1926), *John Smith* (1928), *The Black Rock and Other Poems* (1928). He was one of the first to essay free verse successfully and together with Amy Lowell was considered as leading the so-called Imagist school of modern poetry.

**FLEWELLING, RALPH TYLER** (1871- ). An American professor of philosophy, born at De Witt, Mich., and educated at the University of Michigan, Alma College (Mich.), the Garrett Biblical Institute (Evanston, Ill.), and Boston University. He was ordained in the Methodist Episcopal ministry in 1896, holding pastorates from 1903 to 1917, and in the latter year becoming professor and head of the department of philosophy in the University of Southern California. In 1918 he was at the Sorbonne, Paris, and was appointed head of the department of philosophy at the American Expeditionary Force University at Beaune, France. He is the author of *Christ and the Dramas of Doubt* (1913), *Personalism and the Problems of Philosophy* (1915), *Philosophy and the War* (1918), *Bergson and Personal Realism* (1919), *The Reason in Faith* (1924), and *Creative Personality* (1926). He also contributed to the *Hastings Encyclopedia of Religion and Ethics* (1917), and founded and edited *The Personalist* (1920).

**FLEXNER, SIMON** (1863- ). An American bacteriologist and pathologist (see Vol. VIII). In the World War, he was chairman of the medical advisory committee of the American Red Cross and served as instructor of army medical officers at the Rockefeller Institute. Under his direction, the work of the laboratories of the Rockefeller Institute for Medical Research was increasingly important. After the War, a fully equipped hospital was added to the Institute where research upon specific diseases is carried on. Dr. Flexner extended his studies to include poliomyelitis, encephalitis, and experimental epidemiology.

**FLIGHT.** See **AERONAUTICS.**

**FLINT.** A manufacturing city of Michigan. Its population increased from 38,550 in 1910 to 91,599 in 1920 and to 148,800 in 1928, by estimate of the Bureau of the Census. This rapid expansion has necessitated wholesale building operations and extensive public improvements. In 1916 a civic building association built 3000

houses and in 1918 as many more; in 1927, 2953 houses were constructed. In 1920 an elaborate programme for civic improvements, costing \$2,215,000, was entered upon by the city. In 1924 these expenditures amounted to \$13,325,000 for streets, sewers, schools, and parks, and to \$10,800,000 for public-service facilities. The value of building permits issued in 1927 amounted to \$22,087,451. Four grade schools and a high school were completed the same year. The assessed valuation of property in 1927 was \$164,170,000; the net indebtedness was \$18,076,000. Flint is an important automobile manufacturing centre, being the home of the Buick Motor Company, Chevrolet Motor Company, A C Spark Plug Company, Marvel Carburetor Company, and the Fisher Body Corporation. About 50,000 persons were employed in these industries in 1928.

**FLOATING DOCKS.** See **DOCKS.**

**FLOODS AND FLOOD PROTECTION.** The years immediately following the World War were responsible for increased attention in many parts of the world to the great problems involved in reducing the damage and danger from floods caused by the overflow of rivers and sudden freshets. In China, this problem has always been a pressing one, but as damage by flood always had been considered inevitable, but slight effort had been made to reduce the hazards by engineering plans and construction. In France, the overflowing of the Seine and other rivers has brought temporary inconvenience and damage, and in 1910 after the City of Paris had experienced severe floods due to the rise of the Seine, a careful investigation was made of the best methods of protecting the city from the flood danger. By 1917 a comprehensive report dealing with this subject had been prepared and officially accepted, and from that time on various measures were taken to construct suitable protection works.

In the United States, the spring floods had often brought about vast inundations of farming and other lands, while the sudden rise of waters had produced great damage and loss of life in not a few instances. In addition to the usual spring floods, there were numerous cases where a cloudburst or protracted rain had developed swollen streams which had overflowed their banks, and in many cases had carried away bridges, dams, and other works.

In this latter connection, great danger has been increased, as where towns have been located on river banks they have often encroached upon the channel of the stream, and while the waterway would be ample in ordinary seasons, yet at time of flood it would be too restricted to accommodate the suddenly increased flow. Furthermore, by the construction of bridges the channel often was seriously reduced by the piers and abutments, so that not only were these structures damaged, or at times entirely carried away, but the water was backed up with manifest injury when it overflowed the banks, particularly where cities or villages were located in proximity.

The great flood of 1913 in the United States along the Mississippi and its tributaries resulted in one of the most interesting and important flood-control works ever constructed. This flood was particularly destructive in the valley of the Great Miami and its principal tributaries, the Mad and the Stillwater rivers in southwestern Ohio. Some 360 lives were lost, there was property damage of over \$100,000,000, and the esti-

mated depreciation in real estate values due to flood risks was over \$70,000,000. By 1915, that is, within two years, the principal cities affected, Dayton being the largest, had organized the Miami Conservancy District, had agreed to the apportionment of costs, and works were planned which, completed in 1922, remove forever the flood hazard in this area.

As this plan was worked out, it became clear that the necessary protection for a flood 40 per cent in excess of that of 1913, which was adopted as the "flood plan," might possibly be secured either by retention reservoirs or by channel improvements. By means of large reservoirs having dams with sluice ways, or outlets, of a fixed size, it would be possible to store up a sufficient quantity of water during the peak of the flood so as to reduce the maximum flow through the outlets to a rate which could be safely handled by the river channel below. On the other hand, by the improvement of the river channel alone, removing obstructions, eliminating bends and the many encroachments of man, and by improving the carrying capacity of the channel by lining, etc., it would be possible to pass great floods without damage. The economical plan, however, was a combination of these two methods, a problem involving some interesting analysis of engineering economics, and both reservoirs and channel improvements were provided.

Retarding basins or reservoirs were built as follows: the Taylorsville on the Miami River, the Huffman basin on the Mad River, and the Englewood basin on the Stillwater River. Further upon the Miami was the Lockington reservoir while on Tivin Creek emptying into the Miami below the city of Dayton, the Germantown retarding basin was built. Each of these reservoirs or basins was formed by a large earthen dike or dam pierced by conduits through which the water passed normally, but which at times of flood temporarily restrained the extra water, discharging it gradually at the capacity of the channel which by straightening and levees was increased. In addition to the construction of dams and channels, extensive changes of location of railways and roads were also involved. The total cost was about \$40,000,000.

The protective works of the Miami Conservancy District experienced their first serious test in the flood following the rainfall of Mar. 27-28, 1924. Water was stored back of all the dams to the following depths above the conduit floors: Germantown, 41.6 feet, Englewood, 40.6 feet; Lockington, 27 feet; Taylorsville, 23 feet; and Huffman, 22 feet. Conduits ran full at all dams except Huffman. Maximum discharges at the dams were as follows: Germantown, 6650 second-feet; Englewood, 8400 second-feet; Lockington, 5350 second-feet; Taylorsville, 23,000 second-feet; and Huffman, 13,000 second-feet.

In addition to the dams, the improved channels, which were an important part of the project, received a test when gauge heights of 12.3 and 13 feet were reached at Dayton and Hamilton, respectively. At the former point, the maximum discharge was 36,000 second-feet, while at Hamilton, it was 42,000 second-feet. The flood handled, while in no way approaching the actual capacity of the system, demonstrated the ability of the flood-control works to meet any emergency. It was estimated that without the protective measures, the gauge height at Dayton would have been five or six feet higher, as under previous conditions, and while it would not

have caused much serious trouble, yet it would have developed considerable alarm among the low-lying sections which was no longer felt.

In many cases, it has been extremely difficult to arouse public sentiment to the necessity for flood protection works. Floods, of course, are of infrequent occurrence and appear to be soon forgotten, while protection works are very costly. In recent years, however, great floods have occurred with startling regularity—the Mississippi disaster in 1927 and the Vermont flood in the fall of the same year—and have focused public attention on the flood problem.

**The Mississippi Flood Problem.** The plan followed in the Mississippi Valley has been to confine the great river to a comparatively narrow channel, so as to provide depths necessary for navigation, by levees, or earthen embankments. Millions have been spent in building up the levee system. On several previous occasions, the levees have been almost overtopped, or have actually failed in part, but in general they have been successful in confining the flood waters within the established channels and thus preventing extensive inundation. The great flood of 1927 proved, however, that the present levee system would not afford adequate protection from the higher floods. The flood channel provided was inadequate to carry off this record flow, some twenty major crevasses or breaks in the levees occurred, and many square miles were inundated.

The problem of proper flood control on the Mississippi is complicated by the fact that an adequate flood channel would not only be too wide to give navigation depths with normal river flow but would also require the sacrifice of the rich lower river lands which in many cases have been cultivated right up to the back of the levees. Thus, widening the river channel to peak load capacity is out of the question financially, due to the fact that to move the levees back a few miles would involve taking the most valuable river lands and would also require great and costly works. Such a plan would leave normal flow to clog with silt and deposit a channel which would be seldom full. Storage reservoirs may offer a means of reducing the peak-flood discharge of some of the five tributaries of the great river, but all plans so far proposed are based on providing what might be termed flood relief channels outside the present channel as defined by existing banks or levees. In this way, normal floods will be kept within present channel lines while floods requiring additional channel section will be spilled into relief channels. The need for careful studies to determine flood possibilities from various combinations of floods from the tributaries of the river, economic considerations as regards the conditions in the various territories to be benefited and the selection of locations so as to conserve the areas of greatest economic value make the problem very complicated, and in addition there is always present the question of the reduction of the capacity of the channel, in the course of time, by silting, a phenomenon on which exact data are lacking. It would appear that the main plan must, as already noted, involve deliberately restoring the natural floodway of the Tensas and Atchafalaya rivers as a means of flood relief.

As the Mississippi problem is probably the greatest engineering work ever faced by any nation, involving as it does 31 States and 20,000 square miles of territory, it has attracted unusual

attention. Following the disastrous flood of 1927, plans were proposed both by the Mississippi River Commission and by the Chief of Engineers of the U. S. Army. As far as physical characteristics were concerned, the reports differed but little, whereas in estimate of cost the former was \$775,000,000 while the latter was only \$296,400,000, the principal difference being in allowance for higher and more extensive levees, etc., and in an estimate for damages for private property taken for the work and for which the army engineers made no allowance.

Throughout the year, Mississippi Flood Control continued to be discussed by engineers and others. Engineers in general confined their statements to the need for careful consideration of the problem rather than any quick acceptance of plans, and to urging civilian engineering representation on the flood commission instead of leaving the matter entirely in the hands of government and military engineers. There was also much discussion as to whether the work should be paid for by the Federal Government or by States immediately concerned.

Final action was taken when President Coolidge signed the Jones-Reid Bill on May 15, 1928, providing for flood relief and carrying an appropriation of \$325,000,000. The work will be prosecuted by the Mississippi River Commission under the direction of the Secretary of War and Chief of Engineers. While, in general, the plan proposed by the Chief of Engineers was adopted, a special committee consisting of the Chief of Engineers, the President of the Mississippi River Commission, and a civilian engineer, was appointed to consider the different reports and to recommend action to the President who is given authority to decide the matter. The work includes the section from the Head of the Passes at the delta to Cape Girardeau, Mo. The bill stated that the States having spent large sums in providing previous levee constructions which failed, the cost of the new work would be met by the Federal Government. Thus, a new era of Federal activity in the field of flood prevention is inaugurated.

At this time, General Edgar Jadwin, U. S. A., was Chief of Engineers and C. W. Sturtevant was appointed as civilian engineer to the board of review. The president of the Mississippi River Commission, Col. C. L. Potter, U. S. A. who was of course thoroughly familiar with the plans of that commission, was retired on June 11, 1928, and Col. T. H. Jackson, U. S. A. Corps of the Engineers, was appointed to succeed him. Colonel Potter has since died, (Aug. 6, 1928).

**Vermont Flood Relief.** In order to prevent a recurrence of the Vermont Flood of 1927, causing the loss of 84 lives and over a 30-million-dollar damage, it is proposed to construct storage reservoirs which will serve the dual purpose of power storage and flood retention. A committee appointed by the governor in March, 1928, has submitted plans for five watersheds, the White, Winooski, Lamoille, Missisquoi, and Passumpsic, and recommends that the study of this plan be continued to cover all rivers within the State.

Briefly, the commission points out that the financial situation in Vermont is such that reservoirs for flood retention alone, such as were used in the Miami works in Ohio, are economically impossible. On the other hand, estimates are given showing that reservoirs for power

purposes can be built to supply, for the five rivers mentioned, some 280,000 horse power—far beyond any present market needs. The experience on the Deerfield River in 1927 showed that such reservoirs, usually at low level in the fall when floods occur and hence capable of storing considerable flood flow, were a very effective means of reducing flood discharge. The removal of a number of encroachments of man which obstruct river channels also is recommended, and it is especially noted that the reservoirs must be under competent control and operation as spring floods are not infrequent and, should a flood occur with reservoirs full, the effect of storage in reducing the maximum flood rate would be lost.

**London Flood.** A tidal wave or bore in the Thames Estuary is generally accepted as the cause of a flood which broke over the Thames Embankment at London and did considerable damage, as well as caused some loss of life on Jan. 6-7, 1928. This is the first time such a bore has ever been recorded at London and is the highest water level ever recorded. A barrage across the Thames below the city, which would have prevented such a disaster, was dismissed in 1906 as impractical, but some additions to the embankment will probably be made.

Other flood projects of importance include the San Gabriel project discussed under DAMS, and it is obvious that one of the great civil engineering activities in the coming years will be in flood protection. In this connection, it is to be hoped that the studies and designs will be fully described and published, as has been done so completely by the Miami Conservancy District, so that the literature of the subject may be more completely developed.

**FLORENCE.** The most important city of central Italy. The population in 1926 was 265,799 and in 1928 was estimated to be 277,688. The metallurgical industry has been revived, iron, copper, and other Tuscan minerals which were previously exported being refined in the furnaces of Porto Ferraio and Piombino. Chemical manufactures have also been introduced, and the glass works of Colle Val d'Elsa are known throughout the world on account of their great production of flasks for Chianti wine. The centre of Florentine life is the Piazza della Signoria, in which stands the majestic Palazzo Vecchio, the seat of the municipality. In contrast to the Renaissance Cathedral and Baptistery are the Post and Telegraph Building, erected in the Piazza Vittorio Emanuele in 1917, and the Museo Civico Bardini in the Palazzo Bardini. The latter contains the valuable art collection of the art dealer, Bardini, which was bequeathed to the city in 1922. Until 1919 the Palazzo Pitti was frequently occupied by the Royal Family, but in 1922 the entire palace was converted into an art museum in connection with the famous Palazzo degli Uffizi. In the court of the Ambulance Barracks in the Via Cherubini, a monument was erected in 1924 in memory of the 200 Italian physicians who fell in the World War. On the left bank of the Arno, in the western outskirts of the city, workmen's dwellings have been erected under the auspices of the Ministries of National Economy and Public Works. Three different types have been erected. Those in the Via Bronzino are for workmen whose daily earnings average about 20 lire; those in the Via Pisano are for a better class of tenant; and the remainder are for the poorest class. The dwellings, which are built of stone,

faced with colored plaster, are grouped around gardens or courts. One-third of the capital required was contributed by the state, one-third by the commune, and one-third by a savings bank. A system of motor roads from Florence to the Mediterranean coast is under construction at a cost of 1,000,000 lire per kilometer (about \$84,200 per mile). The Florence-Torre del Lago speedway will include 85 bridges, 3 viaducts, 1 tunnel, 60 transverse raised crossings, and 70 transverse sunken crossings.

**FLORIDA. Area and Population.** The twenty-first State in size (58,666 square miles), and the thirty-second in population; capital, Tallahassee. The population increased from 752,619 in 1910 to 988,470 in 1920, a gain of 28.7 per cent; 1925 State census, 1,263,549; estimated population, 1928, 1,411,000. The white population rose from 443,634 (1910) to 638,153 (1920); the Negro, from 308,669 to 329,487; native white, from 409,702 to 595,145; foreign-born white, from 33,842 to 43,008. The urban population increased from 219,080 to 355,825; rural, from 533,539 to 612,645. Cities grew thus: Jacksonville (q.v.), from 57,699 to 91,558; Tampa, from 37,782 to 51,608; Pensacola, from 22,982 to 31,035; and Miami, from 5471 to 29,571.

**Agriculture.** Although Florida is not one of the leading cotton-producing States, cotton raising is an industry of considerable importance. Like other Southern States, Florida has undergone and to some extent corrected the ravages of the boll weevil, which was well established in the State by 1916-17. (See *CORRON*.) The extent of this damage is indicated by a comparison of the acreage and production for several years: In 1913, 188,000 acres and 59,000 bales; in 1916, 191,000 and 41,000; in 1920, 100,000 and 18,000; 1928, 95,000 and 20,000.

While the population of the State increased rapidly, the number of farms increased 9.7 per cent, or from 54,005 in 1920 to 59,217 in 1925; the acreage in farms decreased 3 per cent, or from 6,046,691 to 5,804,519; and the improved land in farms from 2,297,271 to 2,022,284 acres. The total value of farm property showed an increase of from \$143,183,183 (1910), to \$513,884,122, or at the rate of 259 per cent; while the average value per farm rose from \$2863 to \$8678. In interpreting these statements, however, inflation of currency during the World War is to be taken into consideration. The index number of prices paid to producers of farm products in the United States was 104 in 1910 and 216 in 1920. The percentage of the total area of Florida occupied by farms increased from 15 in 1910 to 16.7 in 1925. In 1925, of the total number of farms, 45,386 were operated by owners; 1010, by managers; and 12,621, by tenants; while comparative figures for 1910 were 35,399; 1275; and 13,342. The white farmers in 1925 numbered 47,205, as compared with 35,295 in 1910; colored, 12,012, as compared with 14,721. The farms reported as under mortgage numbered 8857 in 1925; and 5160 in 1910. The number of cattle was 656,217 in 1924, and 845,188 in 1910; dairy cows in 1924 numbered 43,638; sheep, 59,729 (1924), as against 113,701 (1910); swine, 497,780 and 810,069, respectively. The estimated production of the principal farm crops in 1928 was: Corn, 7,891,000 bushels; potatoes, 3,875,000; sweet potatoes, 2,464,000 bushels; hay, 67,000 tons; tobacco, 9,221,000 pounds; and peanuts, 25,300,000

pounds. (For cotton, see above.) Comparative figures for 1913 are corn, 10,125,000 bushels; oats, 900,000; potatoes, 912,000; tobacco, 4,000,000 pounds; and cotton, 59,000 bales. The increase in production of citrus fruits, from 1909 to 1928 was: Oranges, 4,852,967 to 12,000,000 boxes; grapefruit, 1,061,537 to 8,000,000 boxes.

**Mining.** Florida is not an important mineral-producing State. Domestic phosphate-rock production continues chiefly from this State. Other resources include clay products, fuller's earth, mineral waters, and sand and gravel. The production of phosphate rock in 1914 was 2,138,891 long tons, valued at \$7,354,744; in 1920, 3,369,384 (\$19,464,862); in 1921, 1,780,028 (\$10,431,642); 1926, 2,708,207 (\$8,683,508). The total value of the mineral products increased steadily from \$4,886,010 in 1915 to \$22,923,780 in 1920; but fell to \$12,597,948 in 1921; for 1926 it was \$19,700,522.

**Manufactures.** Florida is not one of the important industrial States, although its manufactures recently have shown a steady increase. There are 10 cities with a population of more than 15,000, including Jacksonville, Tampa, Miami, Pensacola, Key West, and St. Petersburg. These cities for years have furnished not far from one-half of the State's manufactured products. The total number of establishments in 1909 was 2159; 1919, 2582; 1925, 1863; 1927, 1912. The persons engaged in manufactories in those years numbered 64,810, 82,986, 66,204, and 61,219. The capital invested was \$65,290,640 in 1909, and \$206,293,570 in 1919. In 1909 the value of the products was \$72,889,659; 1919, \$213,326,811; 1925, \$267,000,829; and in 1927, \$218,790,152. The high total in 1919 was in a great measure due to changes in industrial conditions brought about by the World War. The principal industries are those connected with lumber and timber products, with products valued in 1909 at \$20,803,000; 1919, at \$50,409,000; and 1925, at \$43,030,860. Tobacco, cigars, and cigarettes were high in value: in 1909, \$21,576,000; in 1919, \$37,926,000; and in 1923, \$36,000,000. Shipbuilding, especially during the War, acquired great importance, the value of the product rising from \$697,000 in 1909 to \$804,000 in 1914, and to \$8,428,000 in 1919. Florida is first among the States in the production of turpentine and rosin; in 1909 the value of these products was \$11,938,000; 1919, \$21,509,000; and 1925, \$14,110,363. Tampa is the first of the cities in manufacturing importance, with 182 establishments and products valued at \$13,804,000 in 1909; 202 and \$14,039,000 in 1914; and 218 and \$55,446,901 in 1925. The number of manufacturing establishments of Jacksonville increased from 114 in 1909 to 173 in 1914, and 204 in 1925; the value of the products, from \$6,722,000 to \$10,148,000, and to \$49,314,650, respectively.

**Education.** Florida has been one of the most progressive of the Southern States in the development of the educational system. Its advance dates from 1892, the year in which the school system of the State was reorganized. Elementary instruction has been greatly extended, and advance made in high-school education has been still more noticeable. Vocational education has been greatly developed in the fields of both industrial and commercial study; and stress has been placed also on instruction in home economics. The Legislature of 1923 passed a teachers' examination certification law, which aimed at improving the grade of teachers em-



ployed. The general progress of this period is indicated by a comparison of the figures of enrollment for several years. In 1912-13 the total school enrollment was 164,727; in 1919-20, 225,160; in 1925-26, 342,643. Enrollment in the white schools in 1912-13 was 106,777; 1919-20, 157,666; 1925-26, 263,458. Enrollment in the Negro schools in 1912-13 was 57,050; in 1919-20, 67,494; and in 1925-26, 79,185. Attendance in the high and elementary schools of the State was at the daily average of 250,355 in 1925-26. Expenditures for public day schools increased from \$2,713,390 in 1912-13 to \$30,089,478 in 1925-26, of which \$14,497,559 was capital outlay. The percentage of illiteracy in the State fell from 15.5 in 1910 to 10.9 in 1920. Among the native white population, it decreased from 5.7 per cent to 3.7 per cent; among the foreign-born white, from 10.5 to 6.6 per cent; and among the colored, from 28.8 to 24.8 per cent.

**Finance.** Expenditures in the year ended June 30, 1927, as reported by the U. S. Department of Commerce, were: for maintenance and operation of governmental departments, \$14,210,985 (of which \$1,372,698 was aid to local education); for interest on debt, \$566,149; for permanent improvements, \$23,041,662; total \$37,818,796 (of which \$22,252,223 was for highways, \$2,696,272 being for maintenance and \$19,555,951 for construction). Revenues were \$27,390,541. From property and special taxes, 20.9 per cent was derived; from departmental earnings and payments for officials' services, 7.9 per cent; from sale of licenses and from gasoline taxes, 57.7 per cent. Property valuation was \$786,054,528; State taxes levied thereon were \$5,926,584. Net State debt was nil, but the State was under contingent liability of \$10,250,000 for debts of the Everglades drainage district.

**Political and Other Events.** While the State continued Democratic in national elections until its Republican swing of 1928, in domestic politics there was a serious break in the party alignment which resulted in the defeat, in 1916, of the Democratic candidate for governor. In 1914 elections were held for minor State officers and for United States Senator. Duncan U. Fletcher was the successful candidate for the latter post, and the Democrats were uniformly successful in electing their candidates. In 1916, when a new Democratic primary law was for the first time put into effect, Sidney J. Catts, candidate on the Prohibition-Independent ticket, defeated W. V. Knott, the Democratic candidate, for governor, and Park Trammell, Democrat, was elected United States Senator. In 1916 President Wilson received 55,984 votes and Charles E. Hughes, 14,611. A proposed "grandfather clause" amendment to the constitution, designed to prevent Negroes from voting, was defeated at this election. In 1917 the Seminole Indians of the State were granted an area of 100,000 acres near the Ten Thousand Islands. In the 1918 elections, the Democrats were uniformly successful. At this election, an amendment to the constitution providing for State-wide prohibition was adopted. In 1920 Cary A. Hardee, Democrat, was elected governor, and Fletcher was reelected to the Senate; for President, Cox received 90,515 votes and Harding 44,853. Alleged peonage in the lumber camps of the State resulted in investigations by grand juries and other bodies in 1922-23. On Apr.

26, 1923, the State Senate, in executive session, ordered the removal of Sheriff J. R. Jones, of Leon County, charged with beating prisoners at county convict camps. On May 14, the Legislature enacted abolition of whipping at the convict labor camps. In 1924 the presidential vote was: Davis (Democratic), 62,083; Coolidge (Republican), 30,633. In 1928 the State broke a long-established precedent by giving a majority to Hoover (Republican) who received 144,168 votes to 101,764 for Smith (Democratic). Doyle E. Carlton (Democrat) was elected governor. The southern part of the State was devastated by hurricanes, Sept. 18, 1926, and Sept. 15, 1928.

**Legislation.** In 1915 measures regulating the liquor traffic were adopted. A special session in 1918 passed measures to enforce the prohibition amendment to the State constitution. The State tax commission was abolished. The Legislature of 1910 passed a measure providing for the compulsory school attendance of children under 16. In 1921 a tax of one cent a gallon was placed on gasoline, the revenue to be used for the building and maintenance of State highways. A constitutional amendment to be submitted to the people in 1922 was passed, providing for the reapportionment of legislative representation and increasing the membership of both the Senate and the House; measures were passed substituting electrocution for hanging; the infliction of cruel or inhuman treatment upon inmates of State institutions was forbidden; and a bill was passed to facilitate the coöperative marketing of agricultural products. In 1923 the Legislature adopted a measure declaring that "Darwinism, atheism, and agnosticism" should not be taught in the institutions of the State.

**FLORIDA, UNIVERSITY OF.** A State institution of higher learning for men, at Gainesville, Florida; founded in 1905. The student enrollment increased from 349 in the year 1913-14 to 2155 in 1928-29, and from 140 in the summer session of 1914 to 1683 in 1928; the faculty between 1913-14 and 1928-29 increased from 63 to 150 members. A gymnasium was built in 1919; an auditorium, a unit of the administration building, was completed in 1924; a unit of the new library in 1925; chemistry and horticulture buildings, and an addition to the engineering building in 1927; while in 1928 a 179-room dormitory was under construction. Among the important changes which took place in 1925 were the organization of the school of pharmacy into a college, the addition of a school of architecture to the engineering college, and the addition of the school of business administration and journalism to the college of arts and sciences; the schools of architecture and business administration were established as separate colleges in 1926; a professorship of Southern History was established in the same year; and a number of scholarship and student-loan funds were given to the university. In September, 1928, John James Tigert, LL.D. resigned as U. S. Commissioner of Education to become president of the University of Florida, succeeding Albert Alexander Murphree, LL.D., who died in December, 1927.

**FLOTATION.** See CHEMISTRY, APPLIED.

**FLOTILLA LEADER.** See VESSEL, NAVAL.

**FLYING BOAT.** See AERONAUTICS.

**FLYNN, WILLIAM JAMES** (1867-1928). A chief of the United States Secret Service, born in New York, where he was educated at the public schools. He entered the Secret Service

Department of the United States Government in 1897. In the period 1912-17, he was chief of the Secret Service; in 1918, chief of the Secret Service of the United States railroad administration, and director of the Bureau of Investigation of the Department of Justice, 1919-21. After his resignation, he made his headquarters in New York City, where he edited *Flynn's Weekly*.

**FOCH, FERDINAND (1851-1929).** A Marshal of France and Commander-in-Chief of the Allied armies in 1918. He was born at Tarbes, educated at the Catholic College of St. Clément at Metz, and at the École Polytechnique, and entered the army. He advanced rapidly, acted for a time as an instructor of tactics at the Military School of Paris, and later became commandant of the same Academy. During the World War, he served at the Marne, Ypres, and the Somme, entered the Higher War Council in 1917, and in the same year became the French commander on the Italian front. In March, 1918, he was appointed the generalissimo of the Allied armies, and after the winning offensive which he planned and commanded, he drafted and presented the German delegates with the armistice terms of Nov. 11, 1918. Foch was often criticized for halting hostilities instead of continuing the offensive onto German territory, but he held that such a course would mean a useless sacrifice of life. He was elected to the French Academy (1918) and to the Academy of Science, was given the British Order of Merit (1918), having been created a Knight of the Grand Cross of the Bath in 1914, was made a British Field Marshal in 1919, the first foreigner to be so honored, and in 1917 he received an honorary D.C.L. degree from Oxford University. He received the Distinguished Service Medal of the United States; France gave him the Grand Croix of the Legion of Honor, the Médaille Militaire, and the Croix de Guerre, as well as other honors, but he refused all gifts excepting the Paris house lent to him by the French Government, living simply, on his army pay. He was president of the Allied Military Commission which sat at Versailles, and in 1921 visited the United States as the guest of the American Legion. His only son was killed in active service during the War. On Marshal Foch's death from influenza and pneumonia, after an illness of two months, on Mar. 20, 1920, a state funeral was decreed, the first in thirty years. On the 24th, his body lay beside that of the Unknown Soldier under the Arc de Triomphe; on the 25th, it was placed in the Cathedral of Notre Dame where the requiem mass was said the following day. The funeral procession marched through the rue de Rivoli and the Champs Élysées to the Invalides, where Premier Poincaré delivered the funeral oration. Representatives of all the Allied nations joined in the ceremonies. He worked on his memoirs for two years before his death, but was unable to complete them. His other writings were *Les Principes de la Guerre* (1903); *De la Conduite de la Guerre* (1904); and *Éloge de Napoléon* (1921); Consult *Les Trois Maréchaux*, by Le Goffie (1919); *Le Maréchal Foch*, by Louis Madelin (1925); *Foch Speaks*, by Major Charles Bugnet (Eng. trans., 1929). See WAR IN EUROPE.

**FOG SIGNALS.** See LIGHTHOUSES; RADIO TELEGRAPHY.

**FOKKER, fók'kér, ANTHONY HERMAN GERARD (1890- ).** A Dutch-American aircraft constructor who was born in Kediri, in the

Dutch East Indies and educated in Haarlem, Holland. A pioneer in the construction of airplanes, his first factory was in Schwerin, Mecklenburg. The Germans made much use of his pursuit planes and devices during the World War. At its close, he established a factory in Holland, and two in America, (Wheeling, Va. and Hasbrouck Heights, N. J.). He had a great influence on new developments in airplane construction involving welded-steel tubing in fuselage construction. Mr. Fokker built his first all-steel fuselage in 1911. He became a citizen of the United States, and was the designer of the plane in which Commander Richard E. Byrd crossed the Atlantic.

**FOLINSBEE, JOHN FULTON (1892- ).** An American landscape painter born in Buffalo, N. Y., and educated at the Art Students' League in New York and the Woodstock School of Art. He was a pupil of John Carlson, F. V. DuMond, and Birge Harrison. He is known especially for his winter landscapes, painted in straightforward impressionistic technique, and is represented in the Corcoran Gallery at Washington, in the Syracuse Museum, and in the National Arts Club of New York. His long list of awards includes the Carnegie and J. Francis Murphy prizes from the National Academy of Design in 1921, the first Hallgarten Prize of the National Academy in 1923 and the U. Francis Murphy Prize in 1926. He was elected a member of the National Academy of Design in 1928.

**FOLK, JOSEPH WINGATE (1869-1923).** An American lawyer and public official (see Vol. VIII). From 1914 to 1918, he was chief counsel for the Interstate Commerce Commission.

**FOLKLORE.** See ETNOLOGY.

**FOLK PSYCHOLOGY.** See SOCIAL PSYCHOLOGY.

**FOOD AND NUTRITION.** Ideas as to what constitutes a complete food have changed considerably since the early years of the century. The beginning of this change was perhaps the discovery that proteins are unlike in composition and that they are complete or incomplete and of good or poor biological value in so far as they do or do not contain in sufficient amounts certain of the amino acids or "building stones" of which they are composed. Fortunately, the essential amino acids which must be supplied in the food are few in number, and in an ordinary mixed diet the deficiencies in one protein are compensated, by an abundance of the necessary constituents in others. It is essential, however, to bear in mind that all proteins are not of equal nutritive value. In general, the cereal grains contain proteins of lower value than do meats, eggs, and milk, and should not be used as the exclusive source of protein.

**Vitamins.** As an outcome of the study of the relative nutritive value of the different proteins came the discovery of the vitamins, those essential food constituents present in natural foods in such small amounts as to have escaped detection for many years and the chemical nature of which is as yet uncertain. At present, six independent vitamins differing in physical, chemical, and physiological properties are recognized, and in all probability these do not complete the list. It has become the custom to name the vitamins alphabetically, as their independent existence is determined, although descriptive adjectives are frequently used to distinguish between the physiological properties peculiar to each. Vitamin A, sometimes known as fat-soluble A, the anti-ophthalmic or anti-ex-



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**FERDINAND FOCH**  
**MARSHAL OF FRANCE AND GENERALISSIMO OF THE ALLIED ARMIES**  
**IN THE WORLD WAR**



ophthalmic vitamin, or more properly the anti-infective vitamin, is essential for growth, well-being at all ages, and successful reproduction, and more especially for resistance to infections of various kinds. Its complete absence from the diet of experimental animals is followed by degenerative changes accompanied by infection in the mucous membranes throughout the body. The most easily detected of these is an eye infection, but probably of more frequent occurrence are abscesses at the base of the tongue. Infection in the ear, sinuses, lungs, and alimentary tract often occur. It is thought that many common suppurative processes in man may be due to lack of vitamin A. This vitamin occurs in milk (especially in the butter fat), eggs, green leafy vegetables, and many yellow pigmented foods. When consumed in excess of requirements, it can be stored in the body for future needs, and for this reason and because of its great importance in increasing the resistance of the body to infection, foods rich in this vitamin should be eaten regularly and abundantly.

The next in alphabetical order, vitamin B, is now known to be made up of at least two and possibly more independent vitamins. The mixture, or vitamin B complex, as it is sometimes called, is essential for the maintenance of appetite, growth, reproduction, lactation, and the proper functioning of the digestive tract. Its complete absence from the diet is followed in a short time by loss in appetite, rapid loss in weight, and death. Unlike vitamin A, the body has only a limited capacity for storing vitamin B. It has recently been found that very much more of the vitamin B complex is required for lactation than for growth, and it is thought that lack of sufficient vitamin B may be the cause of a high percentage of infant mortality.

The two vitamins now identified in vitamin B are commonly called vitamin F and G in the United States and B<sub>1</sub> and B<sub>2</sub> in England. Vitamin F is the anti-neuritic vitamin formerly thought to be identical with vitamin B but now known to be a part of it. Vitamin G is often spoken of as the anti-pellagic vitamin for its absence from the diet of experimental rats is followed by symptoms very similar to pellagra in man, and human pellagra may be prevented and cured by substances which are good sources of this vitamin. Among the few foods which have been tested for vitamin F and G separately, cereal grains are good sources of F and poor of G, and milk and green vegetables good sources of G and poor of F. Bread and milk thus supplement each other with respect to these vitamins and become a richer source of what has been known as vitamin B than either one alone. Each of these vitamins is essential for growth.

Vitamin C, sometimes known as water-soluble C, or the anti-scorbutic vitamin, is essential for growth and well-being in certain laboratory animals and in man. Its complete absence from the diet leads to the well-known disease, scurvy. An inadequate supply leads to loss of stamina, tooth decay, decreased resistance to infection, and possibly to much of the so-called rheumatism. The capacity of the body to store this vitamin is limited. Citrus fruits and tomatoes are particularly good sources of this vitamin.

Vitamin D, otherwise known as the anti-rachitic vitamin, resembles vitamin A in that it is soluble in fats and fat solvents and can be stored in the body to an important extent. Like the other vitamins, it is essential to growth and well-

being. It plays an important part in the assimilation and utilization of calcium and phosphorus, and thus in the prevention of rickets, particularly when these elements are present in the food in unfavorable proportions. At present, it occupies the unique position among vitamins in being the only one which has been synthesized in the laboratory from a definite chemical compound. Its inactive precursor or pro-vitamin is ergosterol, which is transformed into vitamin D by suitable irradiation with ultra-violet light. The skin also contains ergosterol so that by the action of light on the skin, vitamin D can be formed within the body. Since ergosterol is present in many food materials, it is possible to synthesize vitamin D in these materials by irradiation. Cod liver oil is one of the richest natural sources of vitamin D. Egg yolk is relatively rich in this vitamin, and milk and dairy products contain it in appreciable though not large amounts.

Vitamin E, the anti-sterility vitamin, belongs to the group of fat-soluble vitamins and resembles vitamin A to a marked extent in its physical and chemical properties. As is indicated by its descriptive name, this vitamin is characterized chiefly by its function in completing the reproduction processes, although it should be kept in mind that absence of any of the vitamins, as of any other essential constituent of food, has an indirect influence on reproduction. Wheat embryo and green lettuce are among the richest sources of vitamin E.

The increasing evidence of minor symptoms, particularly lack of stamina, a tendency to digestive disturbances, and a lowered resistance to infection, resulting from an insufficiency of vitamins makes their consideration a matter of great importance. There is no evidence that excess of any of the vitamins as present in natural foods is harmful, and, since the absolute requirements for human nutrition are as yet unknown, it is well at all times to furnish an abundance of vitamin-containing foods. In this respect milk is an ideal food. It is an excellent source of vitamin A, a good source of vitamin G, contains appreciable amounts of vitamins C and D, and is furthermore the best source of calcium for growing children. It is customary in infant feeding to safeguard possible vitamin deficiencies in milk by the use of a little orange or tomato juice for vitamin C, cod-liver oil for vitamin D, and occasionally wheat germ or yeast extract for the vitamin B complex. In a mixed diet, plenty of milk and an abundance of green vegetables and fruits will insure an adequate supply of vitamins.

**Mineral elements.** Although the necessity in the diet of certain mineral elements, such as calcium, phosphorus, and iron, has long been known, it is beginning to be realized that other mineral elements present in natural foods in traces only may be of equal importance. Iodine is now universally recognized as a food constituent essential for the prevention of goiter. In goitrous localities, the introduction of minute amounts of iodine into the diet through its addition to the drinking water or to common salt has met with success, and iodized salt is now purchasable at almost any grocery store. Discrepancies in the value of different sources of iron in the treatment of simple nutritional anemia have been traced to the presence or absence of copper, traces of which are apparently essential for the utilization of iron in hemo-



globin formation. Some evidence also has been obtained that small amounts of manganese are likewise effective in supplementing iron. The ash of various food materials has been found to be effective in the cure of severe experimental anemia produced by repeated bleedings. It appears probable that a proper balance of many inorganic elements is essential for successful nutrition.

**Standards of nutrition.** In general, the requirements for successful nutrition are included in what might well be called the nutrition creed, as expressed by Sherman: "(1) Sufficient of the organic nutrients in digestible form to yield the needed energy, (2) protein sufficient in amount and appropriate in kind, (3) adequate amounts and proper proportions of the various ash constituents or inorganic foodstuffs, and (4) sufficient of the essential vitamins." Although the recent developments, as summarized above, indicate that information may still be incomplete concerning at least the third and fourth articles in the creed, there has been a gradual change in the past few years toward higher standards of nutrition. With increased knowledge of food requirements, the goal is now *optimal* rather than *adequate* nutrition. The use as laboratory reagents for nutrition studies of the rat with a life span only about one-thirtieth that of human beings, has made it possible to show that diets hitherto considered adequate are capable of still further improvement.

Increasing attention is being given, particularly in the United States, to the nutrition of school children. Various indices of nutrition have been proposed and are being used to determine the extent of malnutrition. The most commonly used is the Baldwin-Wood standard of height and weight for age. These standards, while not infallible, serve to indicate roughly the nutritional status of the child, and considerable success has been attained in correcting malnutrition as thus detected by supplementary school lunches, usually milk. In Great Britain, a long-time experiment on a large scale showed almost as good results from skim milk as from whole milk. Undernourished children have been shown to have a high protein requirement, and the value of supplementary milk feeding is attributed by some quite as much to the quantity and quality of its proteins as to its content of calcium and vitamins.

**Diet in relation to disease.** *Diabetes.* The use of insulin with properly controlled diets has changed the mortality rate among diabetic children from about 80 per cent to 1 per cent. The necessity for rigid control of the diet has afforded an opportunity to study the effect of properly balanced diets upon the general nutritional condition of children. Investigators at the University of Iowa Medical School have found the growth response of diabetic children under careful dietary control to be greater than that of the so-called superior groups of nondiabetic children according to the Baldwin standard. It was found also that children who had been under dietary treatment for diabetes for six months or more invariably showed signs of arrested caries in place of progressive caries before the treatment. This was thought to indicate the dependence of dental caries in children upon recent dietary inadequacies and the possibility of checking or preventing caries by adequate diets. Joslin has recently emphasized the hereditary nature of

diabetes and the possibility that the disease may be latent in the parent until after it has appeared in the child. For this reason, he recommends the avoidance of obesity by all the relatives of a diabetic child as middle life is approached.

**Pernicious anemia.** With the discovery by Minot and Murphy of the beneficial effects of liver in the treatment of pernicious anemia, this disease may now be classed among the nutritional diseases. The publicity given to this treatment caused liver eating to become quite a fad, regardless of the type of anemias or even definite proof of an anemic condition. While liver is undoubtedly an excellent article of diet, other foods may be substituted for it in simple anemia or as a source of vitamins, but thus far nothing, with the possible exception of kidney, has been found to serve the same purpose in pernicious anemia. For this reason, the wave of popularity for liver has worked a hardship in the case of pernicious anemia patients on account of the exorbitant cost and scarcity of calves liver.

**Pellagra.** Although it is generally conceded that lack of a specific vitamin, vitamin G, is responsible to a certain degree in the development of pellagra, the pellagra problem is not yet solved. Salmon and his associates at the Alabama Agricultural Experiment Station have obtained rather convincing evidence that experimental pellagra in rats involves not only a dietary deficiency but an infection, a comparatively nonpathogenic organism becoming pathogenic as a result of a deficiency of the anti-pellagic vitamin.

**Rickets.** The possibility of duplicating the effect of cod-liver oil or other sources of anti-rachitic vitamin by suitable exposure to sunlight or ultra-violet light has led to the exploitation of ultra-violet lamps and special glass for windows. While such glass may be of value in hospital solariums, the expense of installation is hardly justifiable in ordinary homes, nor are ultra-violet lamps within the reach of everyone. In England and on the Continent, irradiated ergosterol is being used extensively in the prevention and treatment of rickets. These measures have tended to obscure the fact that rickets is essentially a matter of nutritional deficiency, and that the action of sunlight or artificial light is probably to form the anti-rachitic vitamin in the body, the function of which is to promote better utilization of calcium and phosphorus. Attention should be paid quite as much to securing an abundance of calcium and phosphorus as of the anti-rachitic vitamin. Park, a critical student of rickets not only under laboratory but clinical conditions, has stated his belief in the possibility of abolishing rickets by food and sunlight as follows: "Personally, I believe that if pregnant women received ample well-balanced diets in which green vegetables were abundantly supplied and cow's milk was regularly taken, and kept a sufficient part of their time in the open air and sun, and if their infants were placed in the direct rays of the sun for a part of each day and were fed cod-liver oil for the first two or three years of life, more could be accomplished in regard to the eradication of caries of the teeth than in all other ways put together, and that rickets would be abolished from the earth."

All in all, the discoveries of the past two or three decades in the field of nutrition have emphasized the importance of what has sometimes been called the "infinitely small" factors in nu-

trition and have shaken the belief that knowledge is complete concerning what constitutes a balanced diet. While the requirements for successful nutrition may still be stated in terms of the four factors referred to above, there is still much to be learned concerning each of these factors, but more particularly the balance of ash constituents and the balance of vitamins.

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**FOOT-AND-MOUTH DISEASE.** See VETERINARY MEDICINE.

**FOOTBALL.** Several varieties of football are played, but the term is becoming more and more restricted to the type of game which has made such amazing headway in the American college world. No other sport in modern times has gained so firm a grip on the college man or aroused the intense interest of an immense number of spectators among the public at large as football. Stadiums of sufficient seating capacity to care for the hosts that clamor to see the more important games are still being constructed and each year sees larger and larger amphitheatres erected. Increasing curtailment of the number of tickets allowed to alumni and undergraduates has been made necessary.

The changes made in the rules for the original game have unquestionably contributed greatly to football's increased popularity. Mass play was legislated against and the so-called open play introduced. It is possible now for the average spectator, as well as the gridiron expert, to get the drift of what is going on.

Although the rule makers have done well with most of their innovations, their recent move in 1927 aroused considerable criticism. This called for the removal of the goal posts to a place 10 yards behind the last chalk mark, which has "killed" the drop kick for goal, one of the prettiest manoeuvres of the game in the opinion of many.

No such thing as a "championship eleven" is

now possible in American college football. There is no "world series" between two league or sectional title holders. The only way that the question of supremacy could be settled would be the arrangement of a post-season game between two preëminent teams, but the college authorities have always opposed such a procedure.

But if football can boast no champions, it yet has many elements to afford the desired "thrills." With the open game, the little college is put on a fairly equal footing with the members of the "Big Threes" and "Big Fours," etc. Every gridiron season, therefore, is sure to have its quota of upsets. The intersectional contests also afford much interest and much food for analysis.

The success of the college game led inevitably to the advent of professional football with the teams being recruited mainly from former college players of reputation. In a few cities in the Middle West, this movement appears to be successful in a financial way with the public rallying to its support, but in New York and other Eastern cities, the professional clubs do not appear to be gaining the necessary followings. See SOCCER.

**FORAIN, fô'rân', JEAN LOUIS** (1852- ). A French caricaturist, etcher, and painter (see VOL. VIII). He was elected President of the Académie des Beaux Arts in 1928, and was President of the Société Nationale des Beaux-Arts. During the World War, his weekly cartoons in *L'Opinion* were notable, and later he executed an important series of etchings on war subjects. Although most widely known as a penetrating illustrator of French manners, in which capacity he has continued to contribute to numerous periodicals, as an etcher he is styled incomparable, and his work in painting is delicate and delightful. Additional publications include *Nous, vous, eux*; *La Vie*; and *De la Marne au Rhin*.

**FORAKER, JOSEPH BENSON** (1840-1917). An American legislator (see VOL. VIII). He was defeated by Warren G. Harding in the Republican primaries for a seat in the Senate in 1914. A year before his death, he published *Notes on a Busy Life*.

**FORBES, JAMES** (1871- ). A playwright, born at Salem, Ont. He went to the United States in 1884 and was successively dramatic critic, editor, and press representative. He first attempted play-writing in *The Ochorus Lady* (1906), an immediate success. He organized and directed the formation of groups of professionals sent to Europe to entertain the American Expeditionary Forces during the World War, organized the first stock company of actors to play in repertoire in France, and originated the plan of organizing other actors who were serving in the army into stock companies. His later plays include *The Show Shop*; *The Famous Mrs. Fair* (1919); *The Endless Chain* (1922); and *Young Blood* (1926).

**FORBES, W (ILLIAM) CAMERON** (1870- ). An American public official (see VOL. IX), who was appointed by President Harding to the Wood-Forbes mission to investigate conditions in the Philippine Islands in 1921. He was overseer at Harvard, 1914-20. He wrote: *As to Polo* (1920); *The Romance of Business* (1921); *The Philippine Islands* (1928).

**FORD, FORD MADOX** (1873- ). An English author, son of a German, Hueffer, whose

name he later abandoned, and editor of the *Transatlantic Review*. His education consisted largely in listening to the conversations of the Pre-Raphaelites and visiting relatives in France and Germany. Strongly influenced by the Henley group, who considered that one ought to undergo a real struggle with existence, he worked on a farm for thirteen years. Conrad and Henry James were in the neighborhood, and he came under the influence of the latter, and wrote *The Inheritors* (1901) and *Romance* (1903) with the former. He was gassed while with the British forces in France during the World War and temporarily lost his memory. His biographies were *Life of Madox Brown*, his grandfather, the painter (1896), *Henry James* (1913), and *Joseph Conrad* (1924). Miscellaneous works included *The Pre-Raphaelite Brotherhood* (1907); *Ancient Lights* (1911); *Thus to Revisit: Some Reminiscences* (1921); *Mr. Bosphorus and the Muses; or a short History of Poetry in England* (1923); *New York Essays* (1927), and *New York is not America* (1927). His travel books were *The Soul of London* (1905) and *A Mirror to France* (1926). *The Collected Poems of Ford Madox Hueffer* appeared in 1914 and 1916, and were supplemented by *New Poems* in 1927. His novels were of two kinds—the historical and the modern. The former included *The Fifth Queen* (1906); *Privy Seal* (1907); *The Fifth Queen Crowned: A Trilogy* (1908); *Ladies Whose Bright Eyes* (1911), and *A Little Less Than Gods*, dealing with the French Revolution (1928). Some of his novels of modern life were *Mr. Apollo* (1908); *A Call* (1910); *The Good Soldier* (1915); *Some Do Not* (1924); *More Parades* (1925); *A Man Could Stand Up* (1926); and *The Last Post* (1928).

**FORD, GEORGE BURDETT** (1879– ). An American architect and specialist in city planning, born at Clinton, Mass., and educated at the Massachusetts Institute of Technology and the École des Beaux-Arts in Paris. He began practice in Boston in 1901, afterward continuing in New York City. As a specialist in city planning, he was consultant, at various times, for New York City, Passaic, Jersey City, N. J.; Omaha, Neb.; Springfield, Mass.; Cincinnati, Mansfield, Ohio, and many other cities. In France, he was consultant to the French government for the reconstruction of cities in the devastated regions after the World War.

**FORD, HENRY** (1863– ). An American manufacturer (see VOL. IX). In December of 1915, he chartered a ship to send a party of peace enthusiasts to Europe with the object of organizing a conference to influence the belligerent governments to cease warfare. The party went to Christiania, Norway, and thence some members proceeded to Stockholm, Copenhagen, and The Hague, but the entire movement ended unsatisfactorily; it was not officially recognized abroad, and dissension arose in the ranks of the members themselves. In 1916 he brought a libel suit against the *Chicago Tribune* for \$1,000,000 because he had been called an anarchist in one of its editorials. The court awarded him a verdict of \$06 and the cost of the trial. A controversy arose in 1918 over the results of the senatorial election between Truman H. Newberry, Republican, and Mr. Ford, Democrat. Ford charged his opponent with excessive expenditure in his campaign. Newberry was charged and convicted, but on appeal to the Supreme Court, the decision was reversed in

January, 1922. Mr. Ford resigned as president of the Ford Motor Company in 1920 and was succeeded by his son. He built and equipped the Henry Ford Hospital in Detroit at a cost of \$7,500,000. About the same time, he bought the *Dearborn* (Mich.) *Independent*, in which from time to time he severely criticized the Jews. This criticism he publicly recanted on July 8, 1927. In 1928 he supported Herbert Hoover for President. In that year he made extensive purchases of early American machines and implements to be placed in his industrial museum. He also made a hobby in later years of collecting early American furniture, household implements, etc. See **MUSCLE SHOALS**.

**FORD, HENRY JONES** (1851–1925). An American journalist and professor of politics (see VOL. IX). In 1920–21 he was a member of the Interstate Commerce Commission. He published *The Scotch-Irish in America* (1915), *The Natural History of the State* (1915), *Woodrow Wilson, the Man and His Work* (1916), *Washington and His Colleagues* (1918), and *The Cleveland Era* (1919).

**FORD, JAMES LAUREN** (1854–1928). An American humorist, editor, and critic (see VOL. IX). He wrote *Waitful Watching* (1916), *Forty-odd Years in the Literary Shop* (1921), and *Hot Corn Ike* (1923), and edited *The Porcupine*, 1917–18.

**FORD, WALTER BURTON** (1874– ). An American mathematician, born at Oneonta, N. Y. He was graduated from Harvard in 1908 and took post-graduate courses at that university and in Europe. He was instructor of mathematics at the University of Michigan, 1900–03, and in 1904–05 at Williams College. After 1905 he was again a member of the faculty of the University of Michigan, serving as professor of mathematics since 1917. He wrote *Plane and Solid Geometry*, 1913; *First Course and Second Course in Algebra*, 1919; *College Algebra* (1922); and *Analytic Geometry* (1924). He also contributed various articles to scientific journals and was editor-in-chief of the *Mathematical Monthly*, 1923–27.

**FORDHAM UNIVERSITY**. A Roman Catholic institution for higher education at Fordham, New York City, founded in 1841. It is under the Society of Jesus and is the largest Roman Catholic institution in America. The student enrollment increased from 1600 in 1913–14 to 7859 in 1928–29, plus 1397 in the summer session of 1928; the faculty was increased from 140 to 212; and the library from 72,700 volumes to 100,000. In 1928–29 the law school enrollment at the University was 1465 and there were, in addition, 175 pre-law students. A gymnasium was built in 1923; the Seismic Observatory, which was a gift of William J. Spain in memory of his son, was completed during 1924; a new library was erected in 1925; a new building which provided a biological laboratory, lecture rooms, and class-room space for about 800 additional students of the college department was completed in 1927; and in 1928 a new faculty building was completed with accommodations for 70, and the seating capacity of the chapel was enlarged to accommodate 1200. In the spring of 1924, the Rev. Joseph Assmuth, from Germany, became head of the biology department; and in 1926 a unit of the Coast Artillery Reserve Officers Training Corps was organized in the college department. President, the Rev. William J. Duane, S.J. Ph.D.

# FORDNEY-McCUMBER TARIFF BILL.

See TARIFF IN THE UNITED STATES.

**FORDYCE**, JOHN ADDISON (1858-1925). An American physician known especially for his work in dermatology and syphilography. He was born in Guernsey Co., Ohio, and received his degree in arts at Adrian College in 1878 and in medicine at Chicago Medical College in 1881. Later, he studied at the University of Berlin and then returned to practice in New York. He was editor of the *Journal of Cutaneous Diseases*, professor of dermatology in Columbia University, and head of the dermatological clinic at Bellevue Hospital. When the salvarsan treatment of syphilis was first introduced, he took it up with great enterprise and many students were attracted to New York to observe the technic and results of the treatment. His name is commemorated in an ailment known as "Fordyce's Disease."

**FOREIGN EXCHANGE.** See FINANCE AND BANKING.

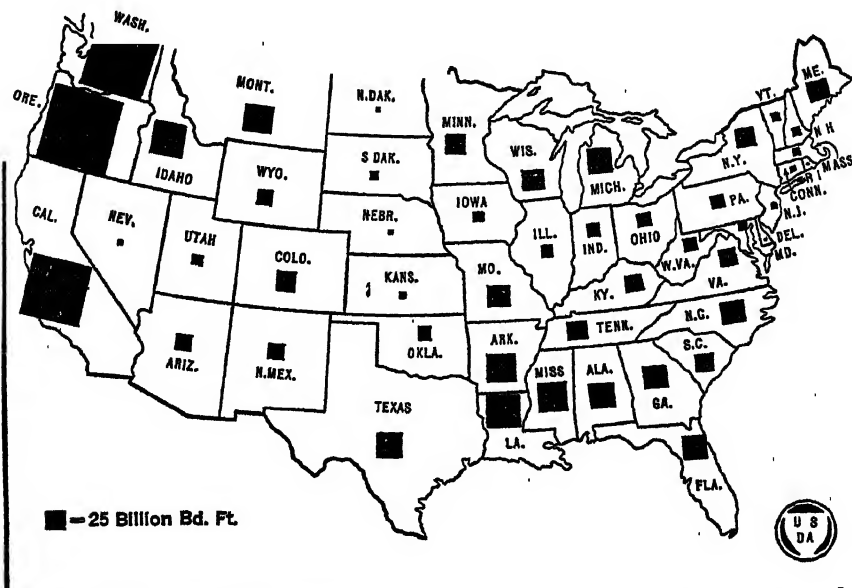
**FORESTRY.** In no single equal period of the world's history were the forest resources of the world so heavily drawn upon as in the years after 1914. Not only the needs of ordinary population growth but the enormous demands of war caused an unprecedented use of lumber, especially the very finest grades. The seriousness of the situation in the United States was indicated in the 1921 report of the Chief Forester, who stated that three-fifths of the virgin timber was gone, and, worse yet, the people were using the remainder at a rate four times that of production. The one redeeming feature of the situation was the growing realization throughout the civilized world at large and in

the United States in particular that forest resources must be conserved in every possible manner. The World Forestry Conference held in Rome, Italy, Apr. 29-May 5, 1926, was a striking example of this increasing interest. A total of 58 widely scattered nations were unanimous in their approval of lumber conservation.

The World War clearly showed how vital forests are to a nation's existence. Without the systematically managed forests of France, the successful prosecution of the War by the Allies might have been grievously delayed. Likewise, it was equally true that the forests of Germany enabled that nation, surrounded as it was by blockading fleets and armies, to endure much longer than it could have without them. One of the peculiar results of the War in relation to forestry was the shutting off for a time of the vast Russian timber supplies from the nations of western Europe. English, French, and German forests suffered severely during the War. It is roughly estimated that in England alone over 1,000,000 acres of private woodlands were cut down for war needs.

**National Forests.** In the United States, the area of the National Forests showed a net decrease of 4,367,608 acres from June 30, 1914, to June 30, 1928, a loss explained in part by the consolidation of small areas and by the release of lands adapted primarily to agriculture. That the National Forests are an important source of income to the Federal government was shown by an aggregate income, during the year ending June 30, 1928, of more than \$5,000,000. The value of the forests as recreation places for the people is beyond calculation. The future of the

## RELATIVE STANDS OF SAW TIMBER BY STATES



(From U. S. Department of Agriculture.)

Most of the remaining timber in the United States is in the South and West, far away from the great industrial and farming States of the Middle West and Northwest, where the need for timber is greatest. Destructive lumbering has greatly reduced the forests of this region. One of the most urgent economic problems is reforestation—the growing of timber on the immense areas of rough land best suited for forests.

National Forests was brightened by the passage in 1928 of the McNary-Woodruff Law which laid down a definite purchase programme. The importance of increasing Federal holdings is suggested by the fact that approximately only one-fifth of the forest lands of the United States are public property.

**Lumber.** Despite the stimulus of war, there has been a consistent decrease in lumber production in the United States since 1906, when a maximum of 46,000,000,000 board feet was reached. This decline in the face of rapidly increasing population meant a sharp drop in per-capita consumption. Taken in connection with a rapid westward movement of the source of supplies, resulting in ever-increasing transportation costs, the lumber situation became increasingly serious. In an effort to reduce waste resulting from the use of a multiplicity of grades and sizes, a committee on lumber standardization, representing the lumber trade and similar committees from the United States Departments of Agriculture and Commerce, proposed in 1923, as the result of joint studies, a series of standard grades for yard lumber and structural timber of all important species. The Forest Products Laboratory of the U. S. Department of Agriculture has rendered material assistance by determining economical means of using low-grade and waste lumber. The United States Forester repeatedly warned the people of the country of the decreasing supply and urged that efforts be made to stimulate timber production in the United States.

**Reproduction.** The period since 1914 has witnessed unusual expansion in forest planting throughout the world. England, suffering from the loss of 1,000,000 acres of woodland during the World War, began actively planting on a large scale and establishing forest nurseries in various parts of England and Scotland. In the United States, not only the Federal government but many States and municipalities saw the wisdom of encouraging forest planting, and many private corporations in Canada and the United States engaged in various forms of lumber operation began planting on a large scale. New York and Pennsylvania developed State nurseries having an annual capacity of millions of trees for distribution.

**Forest Fires.** Fire, long conceded to be the most serious enemy of the forests, continued during this period to exact its enormous toll of timber from the nation. The newspapers and periodicals in directing attention to the fearful results of forest fires did much to present to the general public the seriousness of the situation and to warn tourists and hunters of the danger of careless practices. The first national fire conference ever held in the United States was convened at Sacramento, Calif., during the summer of 1921. All aspects of forest-fire control were discussed. Serious attempts made by both the Canadian and the United States governments to utilize the airplane as a means of controlling forest fires pointed to the probability that airplanes would be most effective in detecting rather than in subduing forest fires. Efforts were made to develop the radio as a means of communication in isolated areas. The Weeks Law, providing \$400,000 Federal funds annually to assist the States in fighting forest fires, aided materially in the reduction of loss. It was generally conceded by expert foresters that fire control is really the most vital factor in forestry, since all

efforts in replanting and improvement are canceled by failure to suppress fires.

The value of effective fire protection was demonstrated in western Washington when, despite the destruction of 6,000,000,000 board feet of timber by a tornado which swept the west side of the Olympic Peninsula on Jan. 20, 1921, no fire losses were reported from the tangled mass of highly inflammable material. As a means of more effective coordination, there was organized in 1928 a national forest protection board composed of representatives of the Forest Service, National Park Service, Bureau of Indian Affairs, General Land Office, the Biological Survey, the Weather Bureau, Bureau of Entomology and Bureau of Plant Industry.

**Forest Experiment Stations.** Under the stimulus imparted by the consciousness of the rapidly diminishing forests, research received unusual consideration during the period subsequent to the War. That there was a significant awakening was concretely manifested in the establishment of a series of new Federal forestry stations as follows: Southern, New Orleans, La., 1922; Appalachian, Asheville, N. C., 1922; Northeastern, Amherst, Mass., 1923; and Lake States, St. Paul, Minn., 1923. Pacific Northwest, Portland, Ore., 1924; Ohio-Mississippi Valley, Columbus, O., 1927; Allegheny, Philadelphia, Pa., 1928. The immediate purpose of these new research institutions is to develop better methods of handling the existing forests and to encourage the reforestation of vast cut-over lands now idle, which only a few decades ago were covered with a splendid growth of forests. The cut-over land problem is particularly acute in the Lake States region, where aspen and scrub oak have succeeded noble stands of pine.

**Pulpwood.** The replacement of the enormous quantities of wood used in the manufacture of paper and paper products presents a problem of national scope, and one that grows increasingly acute. Realizing the seriousness of the situation, the U. S. Department of Agriculture Forest Service studied the possibility of growing more pulpwood and also of utilizing species which hitherto had been considered useless. Some progress has been made in developing means of converting corn stover into paper.

The decline in the forest resources of the mainland of the United States created interest in other possible sources of supply, notably Alaska. Figures presented in the 1921 report of the United States Forester, indicated that the national forests of that territory comprise 20,000,000 acres, containing an estimated stand of 75,000,000,000 board feet of usable timber. Fortunately, the national forests of Alaska represent 85 per cent of the Territory's lumber supply. In order to encourage the rational use of Alaskan timber, the Federal Forest Service offered inducements to reliable corporations to establish pulp mills in the national forests, on a basis of permanent production. Contracts were completed in 1927 whereby two large tracts near Juneau and Ketchikan were opened to development by private corporations working under carefully guarded provisions.

**Insects and Disease.** Not fire alone, but insects and diseases exacted a heavy toll from the forests of the United States and of all the world during the period ended 1928. Perhaps the most insidious enemy of all was the chestnut blight, which, gaining a foothold on the Atlantic coast of the United States, practically eliminated



the chestnut from the eastern United States forests. The white-pine blister rust, long an enemy of the white-pine forests of the eastern United States, became established in the western white-pine forests of British Columbia, Washington, and northern Idaho. The gipsy and brown-tail moths continued their slow but menacing spread throughout New England forests. The tremendous areas involved in forest-pest control rendered suppressive measures exceedingly difficult. Experiments with airplanes as distributors of poisonous dusts gave promising results.

**Land Classification.** The agricultural depression following the War forced the attention of thinking agriculturists, foresters, and business men to the considerable amount of land in the United States which, though utilized for agriculture, was for the time being of essentially greater value for the growing of forest trees. The Secretary of Agriculture named a committee to classify the lands of the United States according to their probable value in the effort to prevent the vain and futile attempts of pioneers to establish homesteads on land primarily unfitted for agriculture.

**Miscellaneous.** The organization in 1920 of the British Empire Forestry Association, connecting all the scattered units of the vast Empire, was a very progressive move. In addition, the publication of a quarterly journal by the association, the first number of which appeared in March, 1922, has helped to promote friendly relations between the various units of the service. The *Journal of Forestry*, published by the Society of American Foresters, continued to develop as an important medium for the exchange of thought and knowledge on American forestry problems. Steady progress was made by the leading forestry schools in strengthening their research and teaching staffs and improving their curricula.

**Bibliography.** The growth of scientific forestry in the United States was indicated by the appearance of an unusual number of books relating to fundamental subjects. The more significant are F. Roth, *Michigan Manual of Forestry*, 2 vols. (Ann Arbor, Mich., 1914 and 1916); H. H. Chapman, *Forest Valuation* (New York, 1915); J. W. Toumey, *Seeding and Planting* (New York, 1916); R. C. Hawley and A. F. Hawes, *Manual of Forestry for the Northeastern United States* (New York, 1918); H. H. Chapman, *Forest Mensuration* (New York and London, 1921); K. W. Woodward, *The Valuation of American Timberlands* (New York and London, 1921); R. Zon and W. N. Sparhawk, *The Forest Resources of the World* (New York and London, 1923); S. J. Record and C. D. Mell, *Timbers of Tropical America*, (New Haven and London, 1924); H. H. Chapman, *Forest Finance* (New Haven, Conn. 1926); E. P. Stebbins, *The Forests of India*, vol. iii, (London, 1926) J. W. Toumey, *Foundations of Silviculture upon an Ecological Basis*, (New York, 1928).

**FORMAN, HENRY JAMES** (1879- ). An American author and editor, born in Russia. He was educated at Harvard and at the École des Hautes Études Sociales, Paris. He was attached to President Roosevelt at the Russo-Japanese Conference as a special correspondent. Earlier in his career, he was literary editor of *Appleton's Magazine* and political editor of the *Literary Digest* (1905-06), associate editor and general manager of the *North American Review* (1906-10), a member of the editorial staff of

*Collier's Weekly* (1913-14), its managing editor (1914-18), and United States propaganda agent abroad (1918-19). His works include *In the Footprints of Heine* (1910), *The Ideal Italian Tour* (1911), *London—An Intimate Picture* (1913), *The Captain of His Soul* (1914), *Fire of Youth* (1920), *The Man Who Lived in a Shoe* (1922), *The Enchanted Garden* (1923), *Guilt* (1924), *The Pony Express* (1925).

**FORMOSA, or TAIWAN.** An island in the western Pacific belonging to Japan; area 13,830 square miles; population, in 1926 3,923,752 as compared with 3,341,217 in 1910. The Japanese increased from 50,000 to 195,769. The great mass of the population thus remained Chinese. The chief town, Taihoku, had 195,555 inhabitants in 1925 as against 95,000 in 1910.

**Industry and Trade.** Rice production is the chief agricultural pursuit, its yield (two crops) in 1927 being 12,444,614 hectolitres. Sugar, tea, jute, and sweet potatoes are other important products. The production of camphor through a government monopoly was 479,204 tons in 1926. A greater application to the natural resources showed itself in increased returns from mining. The total value of minerals, principally coal, gold, copper, and silver, was 14,627,334 yen in 1925; in 1913, it was 4,015,102 yen. Japan continued to absorb the greater part of the Formosa trade, though China and the United States occupied fairly important positions. Discounting the unfavorable years of the World War, the advance was consistent. In 1914 imports from foreign countries totaled 13,013,937 yen and from Japan, 39,879,148 yen; in 1927 imports were 65,840,396 yen from foreign countries, 121,107,991 yen from Japan; exports, 44,597,707 yen to foreign countries; 202,078,577 yen to Japan. Means of inland communication have been pushed. Railroad mileage increased from 290 miles in 1913-14 to 518 miles of government line and 1327.1 miles of private line in 1927.

**Government and History.** Under Japanese administration, the island's welfare improved materially. From the point of view of civil liberties, however, it must be recorded that the government remained absolute. The cost of administration has mounted. In 1913-14 expenditures were 44,473,781 yen; in 1928-29 (estimate), 109,246,000. Receipts were derived from inland taxes, customs, public undertakings, and Japanese subsidies (from 5,000,000 to 9,000,000 yen annually). Monopolies were maintained over camphor, salt, tobacco, opium, sake, and other spirits. As a result of this action, the use of opium gratifyingly fell off.

**FÖRSTER, E(DWARD) M(ORGAN)** (1879- ). A British author, who was educated at Tonbridge and King's College, Cambridge. His novels were *Where Angels Fear to Tread* (1905), *The Longest Journey* (1907), *A Room With a View* (1908), *Howard's End* (1910), *A Passage to India* (1924), awarded the Prix Femina-Vie Heureuse and the James Tait Black Prize, and *The Eternal Moment* (1928). Other works include *Alexandria, a History and a Guide*, *Introduction and Notes to the Letter of Mrs. Eliza Fay*, *Anonymity*, *An Enquiry*, and *Aspects of the Novel*, Clark Lectures, (1927).

**FÖRSTER, fūr'stär, FRIEDRICH W.** (1869- ). A German pacifist and social philosopher, born at Berlin. He studied philosophy, sociology, and political economy at the univer-

sities of Berlin and Freiburg. After teaching philosophy at the Zurich Polytechnikum, he became in 1912 professor of philosophy at the University of Munich. He resigned his chair in 1920 and retired to Switzerland. Förster opposed the German government's policy all through the World War. After the Armistice, he became one of the spiritual leaders of the new Germany. In the manner of the idealistic philosophers of classical Germany, he published an appeal to the people's conscience. In his *World Politics and World Conscience* (*Weltpolitik und Weltgewissen*, 1919), he made a penetrating attack on the policy which Germany had followed since 1870. He pleaded for the return to pacific federalism. From Switzerland he published an autobiographical account of his long struggle with German militarism (*Mein Kampf gegen das Militarismus Deutschlands*, 1920). Förster's other works include *Technik und Ethik* (1905); *Schule und Charakter* (1907); *Sexualethik und Sexualpädagogik* (1907; English translation, *Christianity and Sex*, 1908); *Christentum und Klassenkampf* (1908); *Autorität und Freiheit* (1910); *Schuld und Sühne* (1911); *Politische Ethik und Politische Pädagogik* (1919); *Christentum und Pädagogik* (1920); *Angewandte politische ethik* (1922, 2d ed., 1924); and *Franco-German Reconciliation* (1923).

**FORSYTH, ANDREW RUSSELL** (1858- ). A British mathematician (see Vol. IX). He became professor emeritus of mathematics at the Imperial College of Science and Technology in 1923. His later works include *Calculus of Variations* (1927). He also edited Cayley's *Collected Mathematical Papers* and Burnside's *Theory of Probability* (1928).

**FORT, PAUL** (1872- ). A French poet, born in Rheims; who continued the tradition of the symbolist school of the eighties and nineties. His verse style was a sort of rhythmic prose without any of the ordinary transpositions. His works, largely published as sub-titles in a series entitled *Ballades Françaises*, include *Montagnes, Forêts, Plaines, Mers; Le Roman de Louis XI; L'Amour Marin, Les Nocturnes; Réponse de l'Aube et de la Nuit; Coqcombe, ou l'Homme tout Nu Tombé du Paradis; Vivre en Dieu; Deux chaumières au pays de l'Yveline* (1916); *Poèmes de France* (1916); *La lanterne de Prollet* (1918); *Chansons à la Gauloise* (1919); *Hélène en fleur et Charlemagne* (1921); *L'arbre à poèmes* (1922); *Louis XI, curieux homme* (1922); *Les Compères du roi Louis* (1923); *Ysabeau, chronique de France* (1924); *Le camp du drapeau d'or* (1926), and *L'or Ruggieri* (1927), all plays; *La Tourangelle* (1925); *Fantômes de chaque jour* (1925), and, with Louis Mandin, *Histoire de la poésie française depuis 1850* (1926). Consult *Six French Poets*, by Amy Lowell (1915), *Selected Poems and Ballads of Paul Fort*, translated by J. S. Newberry with an appreciation of Carl Sandburg (1921), and *Paul Fort, sa vie, son œuvre*, by G. A. Masson (1922).

**FORTESCUE, SIR JOHN WILLIAM** (1859- ). A British historian who was librarian at Windsor Castle (1905-26). He received honorary degrees from Edinburgh and Oxford Universities, and was made Knight Commander of the Royal Victorian Order in 1926. His works included *History of the 17th Lancers* (1895); *Dundonald* (1896); *The Three Pearls* (1916); *History of the British Army* (12 vols., to 1859; 1899-1921); *My Native Devon* (1924); *Wellington* (1925); *Six British Soldiers* (1928); *His-*

*torical and Military Essays* (1928); and *The Empire and the Army* (1928). He edited *The Correspondence of King George the Third, 1760-1783* (6 vols., 1927-28); *The Recollections of Rifleman Harris* (1928); *The Note-Books of Captain Coignet* (1928); and *The Life and Adventures of Mrs. Christian Davies*, by Daniel Defoe (1928).

**FORT WORTH.** A city of Texas and an important grain, meat-packing, and oil-refinery centre. The population rose from 73,312 in 1910 to 111,536 in 1920 and to 170,600 in 1928 by estimate of the Bureau of the Census. The area of the city was considerably enlarged by the annexation of a closely built-up territory at the outskirts. In 1925 the city-manager plan of government became effective. During the World War, Camp Bowie and three flying fields were built close to the city. Shortly afterward, the discovery of oil fields near by brought increased activity, and by 1928 the value of petroleum products turned out by the nine refineries in the city was \$54,000,000 annually. The United States helium-gas plant, costing \$5,000,000, was established at Fort Worth, and the city was named one of the four stations for dirigible airships. The dam across Trinity River, begun in 1913, was completed, and on the lake so formed a municipal bathing beach was opened in 1917. A filtration plant was also built. Several large office skyscrapers and many minor buildings were erected, and in the area that had been Camp Bowie, 3500 houses were built. In 1928 building permits reached nearly \$20,000,000. The assessed valuation of property in 1927 was \$164,938,000; the net debt was \$19,803,000. In 1925 industrial plants gave employment to 6968 persons who received \$8,492,000 in wages. The value of products was \$100,329,000.

**FOSDICK, HARRY EMERSON** (1878- ). An American clergyman and professor, born at Buffalo, N. Y., and educated at Colgate University, Union Theological Seminary, and Columbia University. He was ordained to the Baptist ministry in 1903, holding a pastorate at Montclair, N. J., until 1915, when he was named professor of practical theology in the Union Theological Seminary, in New York City (where he had been instructor in homiletics since 1908). He became pastor of the Park Ave. Baptist Church of New York in 1927, having previously served for several years as preacher for the First Presbyterian Church of that city. In 1920 work was in progress upon the new Riverside Church, New York, of which Dr. Fosdick was to become pastor. His works include *The Manhood of the Master* (1913); *The Assurance of Immortality* (1913); *The Meaning of Prayer* (1915); *The Challenge of the Present Crisis* (1917); *The Meaning of Faith* (1917); *The Meaning of Service* (1920), *Christianity and Progress* (1922); a Spanish translation of one of his books, as *La Personalidad del Divino Maestro* (1923); *Twelve Tests of Character* (1924); *The Modern Use of the Bible* (1924); *Adventurous Religion* (1926); *Spiritual Values and Eternal Life* (1927); *A Pilgrimage to Palestine* (1927).

**FOSTER, BEN (JAMIN)** (1852-1926). An American landscape painter (see Vol. IX). In his later works, among which may be mentioned "Late Summer Moonrise," "Litchfield Hills," "Hazy Moonrise," and "From Hill to Hill," his interest in the misty effects of dawn and twilight and moonlit nights was still conspicuous. In 1917 he was awarded the Altman Prize, Na-

tional Academy of Design, and the gold medal and prize, awarded by the National Arts Club.

**FOSTER, SIR GEORGE EULAS** (1847- ). A Canadian public official (see Vol. IX). In 1916 he was a representative of the British government at the Economic Conference in Paris. After the Armistice, he was Canadian representative at the Peace Conference (1919), at the first assembly of the League of Nations in 1921, of which he was elected a vice president, and at the seventh assembly (1926). His publications include *Citizenship* (1926).

**FOSTER, JEANNE ROBERT** (Mrs. MATLACK FOSTER) (1884- ). An American editor and author, born at Johnsbury, N. Y., and educated at Boston University, in Harvard courses, and the Stanhope-Wheatcroft Dramatic School in New York. After various newspaper experience, she became literary editor of the *Review of Reviews*, 1910-22. She was also American editor of the *Transatlantic Review*. Her works include *Wild Apples* (1916), *Neighbors of Yesterday* (1916), and *Rockflower* (1922); all of these are poetry. She edited the *John Quinn Letters* (1925).

**FOSTER, MAXIMILIAN** (1872- ). An American author born in San Francisco and educated at Andover Academy (Mass.). His career started in the newspaper field, which he abandoned for magazine work. Since 1902 he has published several plays and novels, which include *Keeping Up Appearances* (1911), *The Whistling Man* (1913), *The Trap* (1920), *The Silent Partner* (1923), *Humdrum House* (1924), *I Want to Be a Lady* (1926), and various motion-picture plays. During the World War, he was official correspondent for the United States government in France.

**FOSTER, WILLIAM TRUFANT** (1879- ). An American educator (see Vol. IX). He resigned from the presidency of Reed College in 1920 and accepted the directorship of the Francis D. Pollak Foundation for Economic Research (1920- ). He wrote *Should Students Study?* (1917). With Waddill Catchings he wrote: *Money* (1923), *Profits* (1925), *Business Without a Buyer* (1927), and *The Road to Plenty* (1927).

**FOUGNER, G. SELMER** (1884- ). An American journalist, born in Chicago, Ill. He was educated at the Sorbonne, Paris, and began his newspaper career as a member of the editorial staff of the *Paris Herald* (1906-09). He was later with the *New York Press* (1909-12), the *New York Sun* (1912-17), London correspondent for the *New York Sun* (1915), manager of the Press Bureau of New York for the Liberty Loans (United States Treasury, 1917-20), director of newspaper publicity for the second, third, fourth, and fifth loans, and for many organizations and committees of the World War. He directed the publicity of the New York Republican campaign for the Governorship in 1926. He also edited *Paper, The Publisher's Guide*, and *L'Exportateur Américain*.

**FOULKE, WILLIAM DUDLEY** (1848- ). An American civil-service reformer (see Vol. IX). In September, 1923, he was head of a delegation which visited President Coolidge and urged reform of the methods of appointing postmasters. In 1923-34 he was president of the National Civil Service Reform League. He wrote: *A Hoosier Autobiography* (1922); *Is Our Civilization Really Declining?* (1923). A

*Random Record of Travel During Fifty Years* (1925); *Roosevelt and the Spoilsmen* (1925); *Songs of Eventide* (1928).

**FOULOIS, BENJAMIN DELAHAUF** (1879- ). An American army officer, born in Connecticut. He enlisted in the Army as private, became 1st lieutenant in the Signal Corps in 1908, and in 1914 was appointed captain of the Aviation Section of that Corps. From that time he was constantly on aviation duty and was the senior military aviator in the point of service. He commanded the air-service troops on the Mexican border in 1916-17 and in 1917-18 was Chief of the Air Service, A. E. F. He was the American member of the Aviation Committee of the Supreme War Council from 1917 to 1919, in 1920-21 was assistant military observer for the American Commission at Berlin, Germany, and in 1921-24 served as assistant military attaché to the American Embassy at Berlin. He was promoted to be brigadier general in the Signal Corps in 1917, was appointed commanding officer of Mitchel Field, N. Y., in 1925, and assistant chief of the Air Corps in 1927.

**FOUNDATIONS.** The interval since 1914 has not witnessed striking developments in the method of constructing foundations, though there were naturally many improvements in the organization and execution of the work, due to better appliances and incidental improvements. There naturally has been a tendency toward the more extended use of steel or concrete-steel in many cases where wood was formerly used. In foundation construction, reinforced concrete has become an indispensable construction material. The foundation work of the most important character has to do with bridge piers and with large office or public buildings, such as hotels, state or municipal buildings and opera houses.

In modern building construction, the foundation not only supports the skeleton steel frame which with modern construction is constantly increasing in height, but also has to be considered in connection with the increased space in the basement and cellars for machinery for various purposes. As a result, there are involved not merely the piers to carry the main columns of the structure, but also a continuous exterior wall which not only serves as a foundation for the exterior columns but also acts as a retaining wall or coffer dam to resist the pressure of soil or soil and water on the outside of the wall and permits the cellar excavation to be carried below water level. A typical instance of such modern construction was shown in the Federal Reserve Building completed in New York in 1924, where 2,910,000 cubic feet of space, or 182,000 square feet of floor area was provided below curb level for machinery, vaults for securities, storage of various kinds and other general purposes. The deepest pier in this building went down 118 feet below the high curb on Nassau Street and the deepest floor was 80 feet below the same level.

In bridge foundation construction, there have been several notable works since 1914. One of these comprised the anchorages and piers for the suspension bridge across the Delaware between Philadelphia and Camden. An essential element of the Camden anchorage was two reinforced concrete cribs, each 40 feet by 140 feet in plan, which were sunk through silt, sand, and gravel of the river to rock 110 feet below high-water level on the Delaware River. For the river piers, pneumatic caissons were employed which

were fitted with horizontal locks and galleries in the body of the pier so as to afford safety and more convenient access to the working chamber. These pneumatic caissons were built of steel and reinforced concrete 70 feet by 180 feet, and were sunk to a depth of over 75 feet. This did not show a very striking development either in size or method, as the caisson for the New York and Brooklyn suspension bridge, though made of timber, was 172 feet by 102 feet, while that for the Eads Bridge at St. Louis was of boiler plate, 60 feet by 82 feet, both of which works were built a half-century ago.

It has been claimed that in building the piers for the Carlton Railroad-Highway Lift Bridge over the Kennebec River at Bath, Maine, the astounding and long-standing record made in sinking the caissons of Ead's St. Louis Bridge over the Mississippi in 1873 was broken. The east pier of Ead's Bridge was carried down 115 feet below water level, but even this record was surpassed in the east abutment which went down 130 feet below high water. The pier caissons at Bath reached depths of 114.3, 118.3 and 123 feet below high tide. On Ead's Bridge, however, there were 600 men in all employed at various times in the compressed-air work sinking the huge caissons. The air pressure reached 50 pounds per square inch, and it is said the gauge was then removed and there is no record of the highest pressure. Fourteen men died of caisson, or compressed-air disease and there were 119 cases of the malady in all.

At the present time, however, a great deal of compressed-air practice has been standardized, an important addition to the modern caisson being a patented excavating lock through which an ordinary bucket could pass in and out of the compressed air without being detached from the hoisting rope. Improved air compressors are employed. However, most of the improvements in caissons for deep foundations involved such adjuncts as telephones and electric lights in the working chamber, and a better understanding of the physiological effects of compressed air. There was also developed the use of the hospital lock so that the workmen were better protected and less exposed to danger, notwithstanding the fact that their employment under conditions of air pressure was regulated and restricted by local statutes or ordinances. Thus, on the Bath Bridge, a pressure reaching 50 pounds per square inch was used with no difficulty.

Another foundation method first employed on a large scale in sinking the piers for the Poughkeepsie cantilever bridge in 1886, has been recently used on two notable works. At Poughkeepsie there was 100 feet depth of water, and rock was 140 feet below water level. The open dredging process was used. Open caissons divided into a number of compartments were floated to position and sunk in place. Excavation was carried on under water through the open wells, the river bottom being removed by a clam-shell bucket. After completing the excavation, the caisson is solidly filled with concrete. In 1927 unexpected difficulty was encountered in sinking the east pier for the Mid-Hudson suspension bridge just below the Poughkeepsie cantilever bridge. The work was being carried out by the same method, open dredging, but at one time the east caisson was as much out of plumb as  $43\frac{1}{2}$  degrees. In July, 1928, it was finally righted and work again resumed.

In the Carquinez Straits Bridge, crossing an arm of San Francisco Bay and completed in 1927, the fourth largest cantilever in the world, the same open dredging process was employed and a record depth, either close to that at Poughkeepsie or slightly over it, of 132 feet was attained.

Certainly one of the most remarkable pieces of bridge-pier work recently carried out was the foundation construction for the west pier of the great Hudson River suspension bridge. Borings showed rock sloping off steeply from the shore. At the west or shoreward edge of the piers (there are two piers side by side 89 by 98 feet in size and 153.5-ft. centres) rock averaged 39 feet below mean high tide, while at the east or river edge the depth averaged 68 with a maximum of 76 feet. Such depth would usually be reached by pneumatic caissons, but in this case a huge steel sheet-piling cofferdam, with double walls on three sides and of course requiring very heavy interior bracing, was used. The entire excavation was unwatered, the rock surface cleared off and the masonry tower footings were built in the dry. This is probably the largest and deepest bridge-pier work ever undertaken by the cofferdam method.

Pile foundations, of course, continue to be extensively employed. The modern tendency in using piles is to substitute those of concrete for timber piles, and several types of the former are being used extensively. One leading advantage is that the concrete pile when properly made is absolutely permanent under practically all conditions of use including both wet and dry service. Obviously, their use did away with the possible danger of decay in case of water level below the cut-off level which was likely to happen under conditions where much subterranean construction acts to alter the natural water level. The simplest form of modern pile is one of reinforced concrete which has been cast and seasoned before driving and is used in the same manner as one of timber. There was also developed a steel shell and driving mandrel which was left in the ground and acted as a form in which the concrete could be poured. Still another type was a pipe which was closed at the bottom by a loosely fitting cast-iron point. This pipe was sunk in the ground and then after being filled with concrete was removed, leaving the concrete pile and the point in the ground. Another system employed an open pipe which was driven in the ground and the material inside excavated by using a jet of compressed air. The vacant space thus formed could be filled with concrete, both pipe and concrete filling being left in the ground. For driving such pipes, a hydraulic jack was employed and the method was found to be particularly useful in underpinning buildings.

**FOUNDATIONS, EDUCATIONAL.** See UNIVERSITIES AND COLLEGES.

**FOURTEEN POINTS.** See WORLD WAR, DIPLOMACY OF THE, under *War Aims*.

**FOWLER, CHARLES EVAN** (1867- ). An American engineer, born in Bartlett, Ohio. He studied engineering at the Ohio State University and in 1886 began active practice. He designed and built many important railroad and other bridges and was consulting engineer for the Williamsburg Bridge in Manhattan. He planned the Detroit suspension bridge (1920-21), the arch bridge at Sydney, Australia, and the 24-mile causeway over Lake Ponchartrain

at New Orleans, La. He also built many large plants and performed other work in Manila, Mexico, Cuba, and cities of the United States. He was a member of several scientific engineering societies and wrote much on building construction, including *Engineering and Building Foundations* (1919); *World Ports and Harbor Data* (1921).

**FOX, DIXON RYAN** (1887- ). An American historian and professor, born at Potsdam, N. Y., and educated at Columbia University. He was assistant professor of history there, 1919-22, associate professor, 1922-27, and professor since 1927. His works include *Decline of Aristocracy in the Politics of the United States* (1919); *Historical Atlas of the United States* (1920); an *Outline of Early American History* (1922); *Herbert L. Osgood, an American Scholar* (1923); *Caleb Heathcote, Gentleman Colonist* (1926). With A. M. Schlesinger, he edited *A History of American Life* (1928).

**FOX, FONTAINE (TALBOT, JR.)** (1884- ). An American newspaper cartoonist born in Louisville, Ky., best known for his creation of "Fontaine Fox's Funny Folk," "Fontaine Fox's Cartoons," "The Toonerville Trolley," all collected in book form, and many other cartoons. He was connected with the Wheeler Syndicate from 1915 to 1920, with the McNaught Syndicate, 1920-25, and since 1925 has been with the Bell Syndicate, supplying humorous cartoons to about 250 newspapers.

**FOX, PHILIP** (1878- ). An American astronomer, born in Manhattan, Kan. He graduated from the Kansas State Agricultural College in 1897, and from Dartmouth in 1902, taking post-graduate courses in Berlin. After serving on the faculty of Dartmouth College, he became Carnegie research assistant at the Yerkes Observatory at the University of Chicago in 1903, and was instructor in astro-physics at the University of Chicago from 1907 to 1909, when he became professor of astronomy and director of the Dearborn Observatory at Northwestern University. He served in the World War as major of infantry, and as assistant chief of staff in the 7th Division. Professor Fox is the author of *Annals of the Dearborn Observatory* (vols. i and ii).

**FOX, WILLIAM** (1879- ). A motion-picture producer born in Hungary and brought to the United States in infancy. He began his career as a theatrical manager in Brooklyn in 1904 and became president of the Fox circuit of theatres and the Fox Film Corporation. He was one of the earliest moving-picture producers, beginning, like Zukor, with the "penny arcades" and gradually expanding his interests until he was maintaining studios in California and New York. In 1916 he began exhibiting in Europe. Soon he was showing his pictures in many countries. His best-known productions include *Les Misérables*, *Tale of Two Cities*, *Romeo and Juliet*, *A Daughter of the Gods*, *Salome*, *Oleopatra*, *Evangeline*, *Over the Hill*, *The Queen of Sheba*, etc. He did excellent work assisting the Red Cross organization in its drives during the World War.

**FRAENKEL, frēn'kel, SIGMUND** (1868- ). Austrian biochemist, known for his exhaustive works. Born in Krakau, he received the degree of M.D. from the University of Vienna and was appointed professor extraordinary of medical chemistry there. His *Arzneimittelsynthese*, devoted to the synthetic medical drugs and the

relations between chemical constitution and physiological action, appeared in 1901, and has gone through several editions and a translation into English. *Descriptive Biochemie* appeared in 1907, *Dynamische Biochemie* (1911), *Praktikum der Medizinische Chemie*, (1918), and *Arzneimittelsynthese* (1927).

**FRAMPTON, SIR GEORGE JAMES** (1860-1928). An English sculptor (see Vol. IX). He was made a member of the Royal Academy of Belgium (1926). Among his later works, marked by the decorative quality and fine modeling that distinguish his productions, were the Edith Cavell Memorial, London, the statues of Queen Mary for Victoria Memorial Hall, Calcutta, and for Government House, Delhi, and the portrait busts of King George and Queen Mary for the Guildhall.

**FRANCE.** A country of western Europe, bordered on the south by the Mediterranean Sea and Spain, on the east by Italy, Switzerland, and Germany, on the north by Belgium and Luxemburg, and the English Channel, and on the west by the Bay of Biscay and the Atlantic Ocean. Since the Treaty of Versailles, its territory has been increased by the addition of Alsace and Lorraine, which had been in the possession of Germany since 1870. Before the World War, France was divided for administrative purposes into 87 departments (including the territory of Belfort, the remnant of the Haut-Rhin department left to France after the Franco-Prussian War of 1870). The Treaty of Versailles in 1919 restored Alsace-Lorraine to France, adding the three departments, Haut-Rhin, Bas-Rhin, and Moselle. The area of France was 207,054 square miles in 1913, and was increased, by the restoration of Alsace-Lorraine, to 212,659 square miles. The population of France (the old area) in 1911 was 39,604,992, with a population density of 191 persons to the square mile, but War losses brought the population in 1921 down to 39,209,518, with an average density of 184 to the square mile, in spite of the new territories added, which had in 1921 a population of 1,709,740, with a density of 305 to the square mile. The population in 1927 was estimated at 40,960,000 and the density in 1926 at 191.5 per square mile.

About 55,657,000 acres were devoted to crops in France in 1926, this representing 26.4 per cent of the total land area (136,101,760 acres); 27,669,000 acres were used for permanent meadow and pasture; 5,919,000 for trees, shrubs, and bushes; 25,587,000 were covered by woods and forests; and 11,741,000 acres were waste and uncultivated land.

**Population.** The capital and largest city of France, Paris, had a population of 2,906,472 according to the census of 1921 and in 1926 of 2,871,429. The Department of the Seine, which comprises Paris and its suburbs, had a population of 4,628,037 in March, 1926, in an area of 185 square miles. Other important cities are Marseilles (population 652,196 in 1926), the chief Mediterranean port and in most respects the leading port of France; Lyons (population 570,840 in 1926), the centre of French silk manufacture, at the confluence of the Rhone and Saône rivers; Bordeaux (population 256,026), the chief port of southwestern France, the outlet of the Garonne Valley; Lille (population 201,921), textile and industrial city of northern France, before the War one of the most rapidly growing French cities; Nantes (population 184,000 in 1926), a chief port on the Atlantic coast.



500), on the Loire River near its mouth, the outlet for the valley of central France; Toulouse (population 180,771), an inland city on the upper Garonne River, in the centre of an important agricultural and viticultural region; St. Etienne (population 193,737), an important centre for silks, ribbons, and other industries; Strasbourg (population 174,492), formerly in German territory, an important river port and manufacturing city on the Rhine; and Le Havre (population 158,022) at the mouth of the Seine, a port of entry for Paris, of rising importance.

The population of France, even in times of peace, tends to increase with extreme slowness. Several years in the period before the War showed excess of deaths over births; for instance, those of 1890, 1891, and 1892, and 1911. In 1920 and 1921 the birth-rate increased, the excess of births over deaths being 160,000 and 117,000, respectively. The average number of births from 1923 to 1927 was 758,213 and of deaths 689,204, the excess of births being 69,009. The average birth rate per 1000 inhabitants was 18.7 and the death rate 17. In 1928 there were 745,315 births and 675,110 deaths, or a surplus of 70,205 births over deaths. In 1927, 59,271 foreign workers came into the country under contract, and 89,982 such workers departed. Between 1923 and 1927, the excess of entrance of such workers over departures was 589,761.

There is no state religion in France, but the dominant faith is Roman Catholicism. The higher clergy in France included 17 archbishops and 70 bishops. In addition, there were 51,000 clergy of various grades. There were also a number of ecclesiastics teaching in the universities and in the Catholic institutions. Protestantism in France was represented chiefly by synodal Presbyterianism. The Protestant population of France was estimated at about 1,000,000. Judaism and Mohammedanism (the latter chiefly in Algeria) were also represented in France.

**Education.** Educational freedom is provided for by law in France. There are, consequently, a number of private schools maintained by individuals and associations, but all have to conform to national standards of learning and morality, and the state alone has the right to award diplomas and degrees, through examination of the aspirants. The public schools formed the bulk of the French educational system; together they made up the so-called Université de France, divided into three orders—primary education, secondary education, and higher education. The most elementary schools in France were the *écoles maternelles*, a sort of kindergarten; in 1912-13, there were 3976 of these schools, and in 1926-27 only 3690, due to the slowness of reestablishing schools of this type in the devastated regions; the number of pupils attending was 608,315 in 1912-13 and 303,652 in 1926-27. Next were the primary schools proper, numbering 83,095 with 159,982 teachers and 5,669,251 pupils in 1912-13, and 80,183 with 3,853,431 pupils in 1926-27. In 1912-13 there were 83 primary normal schools each for males and females, with 4629 male and 4959 female pupils; while in 1926-27, there were 85 normal schools for males with 5653 students, and 86 for females with 6702 pupils. Secondary education for boys was given in 343 schools in 1913 to 100,203 students and in 262 schools in 1927 to 115,096 students, while secondary education for girls was given in

138 schools in 1913 to 33,282 students, and in 205 schools in 1927 to 52,459 students. Higher education was given to 60,000 students in 1927 of whom 17,125 were under the law faculty, 11,182 students studying medicine, 12,820 science, and 13,343 letters. In 1929 there were 17 universities in France, at Aix-en-Provence, Algiers, Besançon, Bordeaux, Caen, Clermont-Ferrand, Dijon, Grenoble, Lille, Lyon, Montpellier, Nancy, Paris, Poitiers, Rennes, Strasbourg, and Toulouse. The oldest was the University of Paris, founded in 1200, the newest that at Algiers, founded in 1885. The only illiteracy statistics available for France were those in connection with conscription for the army. In 1912 the percentage of illiterate conscripts was 4.18 and in 1921 it was 4.07. In the earlier year, 7694 could neither read nor write, and in the latter year, 6600. In 1926, 9.44 per cent of the conscripts could not write.

**Agriculture.** France is preponderantly an agricultural country, notwithstanding the great importance of French manufactured products, but the proportion of rural inhabitants was steadily, though gradually, decreasing. According to the 1911 census, the rural population was 22,096,000 out of a total of 39,605,000, and according to the 1921 census, for the same area, the rural population was 20,119,000 out of a total of 37,500,000; for the new area of France in 1921, the rural population was 21,004,000 out of a total of 39,210,000. The proportion of persons actually engaged in agricultural work was slightly less; in 1911, the working population of France was 20,931,000, while the agricultural workers numbered 8,517,000. Thus, in 1911 the ratio of agricultural workers to total workers was 407 to 1000, and the ratio of rural population to total population 558 to 1000.

**Agriculture.** The following table gives a comparison between pre-war production and that for 1927. It will be noted that post-war acreage and production in most instances have not caught up with the pre-war figures.

Crop	Area (thousands of acres)		Production (thousands of units—bushels, except as indicated)	
	1909-1913	1927	1909-1913	1927
Wheat	16,500	13,209	325,644	284,353
Rye	3,095	1,970	52,502	36,799
Barley	1,988	1,754	52,827	55,572
Oats	9,829	8,542	368,465	372,539
Potatoes	4,066	3,895	526,789	629,960
Sugar beets	612	545	5,937 <sup>a</sup>	5,573 <sup>a</sup>
Grapevines	4,017	3,393	1,326,821 <sup>b</sup>	1,300,399 <sup>a</sup>

<sup>b</sup> Unit, gallon of wine.

<sup>a</sup> Unit, metric ton.

The value of the principal crops in 1926 was as follows: wheat, \$374,812,000; oats, \$192,312,000; potatoes, \$265,022,000; grape wines, \$262,255. On Dec. 1, 1926, there were 14,482,000 cattle, 5,777,000 swine, 10,775,000 sheep, 1,388,000 goats, 2,804,000 horses, 185,000 mules, and 264,000 asses. The figures for 1913 were: horses, 3,222,000; cattle, 14,788,000; swine, 7,036,000.

**Fisheries.** The French fishing industry was greatly damaged by the War, not only by the requirement of fishermen for service in the army, but also by the requisitioning of boats and equipment. At the end of 1926, the number of vessels was only 23,648, in spite of increases since 1918, as compared with 29,451 in 1912. The number of steam and motor vessels is in-

creasing, but sailing craft (19,812) still predominate. The value of all fishery products in 1926 was placed at 1,057,567,000 francs, and the industry gave employment to 134,532 persons.

**Minerals and Industries.** The leading minerals produced in France are coal, iron, gold, lead, zinc, silver, copper, antimony, manganese, tungsten, bauxite, iron pyrites, mineral oils, salt potash, and stone of various kinds, but not all of these are produced in important quantities.

The accompanying tables give a comparison of representative post-war years with the pre-war year, 1913, for mineral and metal production and manufacturing industries:

**MINERAL AND METAL PRODUCTION**  
(Thousands of Metric Tons)

	1913	1923	1927
Coal and lignite	43,847	37,679	51,780
Coke (metallurgical)	4,027	4,287	4,068
Briquets	...	3,056	3,906
Iron ore	43,054	23,349	45,672
Iron pyrites	311	186	204
Potash (K <sub>2</sub> O content)	350	249	372
Bauxite	309	314	540
Pig iron	9,071	5,468	9,298
Steel (ingots and castings)	6,976	5,302	8,268
Iron and steel (finished products) *	3,592	3,321	...

\* 1913 is exclusive of Alsace-Lorraine.

NOTE.—Data for 1913 are for production within the present boundaries unless otherwise noted.

**MANUFACTURING PRODUCTION**

Product		1913	1923	1926	1927
Silk (conditioned at Lyon)	1000 lbs.	18,519	10,370	14,577	12,707
Wool (conditioned at Roubaix-Tourcoing)	1000 lbs.	204,525	212,250	223,864	229,049
Wool (conditioned at Mazamet)	do	59,842	52,619	46,006	58,387
Cotton cloth	1000 yds.	1,377,950	1,224,844	1,356,064	1,298,103
Artificial silk	metric tons	2,900	3,700	8,000	13,000
Boots and shoes (estimated)	1000 pairs	49,000	52,000	80,000	...
Alcohol	1000 gals.	78,036	47,225	39,217	...
Refined sugar *	metric tons	717,319	445,368	666,055	...
Vessels launched	1000 gross tons	176	97	111	42

\* Data are for seasons ended following year.

**Foreign Trade.** In 1927 the total value of French imports was 52,853,000,000 francs (\$2,073,952,000), as compared with 59,598,000,000 francs (\$1,932,258,000) in 1926 and 10,724,000,000 francs (\$2,070,000,000) in 1913. In comparing 1927 figures with those of 1913, the change in the value of the franc must be taken into consideration. Exports in 1927 were valued at 55,225,000,000 francs (\$2,102,729,000), as against 59,678,000,000 francs (\$1,935,178,000) in 1926 and 9,260,000,000 francs (\$1,787,000,000) in 1913. The weights of both exports and imports were much higher in 1927 than in 1926. The lower value in terms of francs resulted evidently from declines in French selling and buying prices abroad following the improvement in the exchange value of the franc. Imports of manufactured articles were lower both in value and volume in the later year. Imports of foodstuffs, particularly wheat, increased in value and weight, due, in a large measure, to the insufficient crops harvested during 1926.

That the visible trade balance was so favorable is traceable almost entirely to trade with the French colonies and protectorates. Imports from the United States, the largest suppliers, were valued at \$276,691,000 in 1927 as against \$256,698,000 in 1926. Of this total, 36 per cent was represented by raw cotton. Total exports to the United States in 1927 were valued at \$141,462,000, as compared with \$126,516,000 in 1926.

Lingerie and clothing made up approximately 13 per cent of the total export values.

In 1927 the United States supplied 13.3 per cent of the imports and purchased 6.5 per cent of the exports; Argentina, 4.4 and 2.1; Belgium, 7.0 and 13.7; Germany, 8.0 and 11.7; United Kingdom, 12.2 and 18.4; Algeria 4.8 and 7.1. The five leading imports in the order of value in 1927 were wool, cotton, wheat, coal, and wines; the five leading exports in similar order, silk fabrics, cotton fabrics, iron and steel, pearls, and wool and waste.

In contrast to the favorable trade balance of 1927, there was a heavy adverse balance in 1928, as the imports amounted to 53,448,265,000 francs and the exports to 51,346,799,000 francs. The imports in 1928 were classified as follows: foodstuffs, 12,549,775,000 francs; raw materials, 32,089,027,000 francs; and manufactured articles, 7,909,403,000 francs. The exports were: foodstuffs, 6,240,247,000 francs; raw materials, 13,077,023,000 francs; and manufactured articles, 32,029,529,000 francs. The trade with foreign countries as distinguished from that with the colonies and protectorates was responsible in large measure for the heavy adverse balance referred to. Imports from foreign countries were valued at 46,720,343,000 francs and exports at 43,022,282,000 francs. The value of imports from the French colonies and protec-

torates in 1928 was 6,727,922,000 francs, and of exports 8,324,517,000 francs. As in previous years, the United States was the principal supplier to France, followed by Great Britain, Germany, Belgium-Luxemburg, and Argentina in the order named. Great Britain was the heaviest buyer of French merchandise, followed by Belgium-Luxemburg, Germany, Switzerland, and the United States. French imports from the United States were valued at 6,200,346,000 francs and the exports at 3,331,481,000 francs.

**Reconstruction.** The population of the devastated region in the northern and eastern departments of France which totaled 4,790,000 in 1914, had fallen to 2,075,000 in 1918, but in 1928 had increased to 4,645,000. Out of the 1,258,053 dwellings and farm buildings, 866,844 were destroyed; by 1928, 641,011 had been reconstructed, the difference being due to concentration in building. For the same reason, only 8296 factories had been reconstructed, whereas 9332 out of 11,189 plants employing at least 10 workmen were destroyed. Of the 17,616 public edifices destroyed, out of 20,824 which existed in 1914, 14,756 had been rebuilt. Summing up, of the 1,290,066 buildings of all kinds, contained in the census of 1914, a total of 893,792 were destroyed; these had been replaced by 663,063 buildings which were much superior to the pre-war structures.

In 1914 this area had 2,236,227 hectares of land under cultivation, of which 1,922,479

hectares were damaged; 1,862,852 hectares, all that could be restored profitably, were again fit for cultivation. The number of live stock which was reduced almost to nothing was greater than before the war. Of 120,000 kilometers of roads, practically one-half were rendered unfit for use, and 2490 kilometers of main railway lines were destroyed; this damage was practically all repaired. The lines operated by the railways of local interest were longer than before the war, and the length of the navigable waterways also had been increased.

The developments regarding the mining industry are no less striking. In 1914 the coal mines of the Departments of Nord and Pas-de-Calais comprised 271 pits, 3399 kilometers of galleries, 1233 kilometers of track, and 220 machines for extraction of coal; the monthly production of coal averaged 2,260,000 tons. Though all the pits were destroyed in 1918, in 1928 the coal-mining facilities comprised 295 pits, 3788 kilometers of galleries, 1321 kilometers of track, and 236 machines for extraction; the average monthly extraction has increased to 2,706,000 tons. In the iron mines of the Briey and Longwy Basins, which were also destroyed, the facilities in 1928 were much better than formerly, and the output had increased much beyond the pre-war figure.

The work of restoration had included the filling in of 310,675,000 cubic meters of trenches, the clearing of 379,000,000 square meters of barbed wire, the destruction of 22,134,000 tons of munitions found underground, and the pumping out of 107,000,000 cubic meters of water in the coal mines and 10,218,000 cubic meters in the iron mines. The commissions for the evaluation of war damages had examined 3,092,884 demands and had rendered decisions covering indemnities totaling 77,752,750,000 francs. Of this amount the payments made covered 73,525,870,000 francs. It was estimated that the total indemnities due would reach 85,500,000,000 francs and that they would be entirely paid in 1930.

**Finance.** Before the War, French budgets had a practical balance of receipts and expenditures, though in some years expenses showed a greater or less excess. The accounts for the fiscal period, 1913 (i.e., amounts properly attributable to the year 1913, whether received or spent in that year or in 1914) showed revenues amounting to 5,103,000,000 francs and expenses amounting to 5,349,700,000 francs, with an excess of expenses amounting to 246,700,000 francs. The budget for the year 1914 provided for a slight surplus, but war expenses upset the calculations, and initiated the period of large budgets which have continued ever since.

The French budget for 1929 as finally passed on Dec. 30, 1928, varied very slightly from the proposals of the Government. Expenditures were fixed at 45,366,000,000 francs and revenues at 45,430,000,000 francs, leaving an estimated favorable surplus of 64,000,000 francs. These totals represented an increase of approximately 2,780,000,000 francs over the receipts and expenditures of the preceding year. In addition to the general budget, there were various annexed budgets, which for 1929 amounted to 6,233,674,000 francs. Each of the additional budgets included its own independent revenues, which, as a general practice, correspond exactly with the expenditures authorized. The following tables show proposed revenues and expendi-

tures by categories for 1929, with comparative figures for 1928:

REVENUES AND THEIR SOURCES IN THE FRENCH GENERAL BUDGET FOR 1929 (In millions of francs)		
Item	Estimated 1928	Proposed 1929
Direct and assimilated taxes	8,536	9,737
Registry taxes	3,760	3,712
Stamp taxes	1,850	1,898
Taxes on transactions on the bourse	391	347
Tax on securities	3,426	3,525
Luxury tax	21	24
Customs duties	3,677	4,227
Indirect taxes	6,568	6,181
Business turnover tax	8,562	8,509
Sugar and saccharin tax	1,135	1,081
Monopolies	532	557
Public domain	444	444
Reimbursements	2,050	2,181
Sundry receipts	1,186	2,553
Exceptional receipts	342	288
Amounts recoverable in Algeria	17	22
<b>Total</b>	<b>42,497</b>	<b>45,281</b>

EXPENDITURES IN THE FRENCH GENERAL BUDGET FOR 1929 (In millions of francs)		
Ministries	1928 Estimated	1929 Proposed
Finance	25,279	25,241
Justice	246	286
Foreign Affairs	236	245
Interior	736	888
War	6,031	6,815
Marine	2,451	3,091
Public Instruction and Fine Arts	2,585	3,091
Commerce and Industry (commerce and industry, aviation and air transports)	40 218	46 317
Labor, Health, and Social Welfare	959	1,234
Colonies	457	561
Agriculture	381	454
Public Works	2,034	2,180
Pensions	792	907
<b>Total</b>	<b>42,445</b>	<b>45,225</b>

Below are shown the amount and composition of the public debt on July 31, 1926, and Feb. 29, 1928.

FRENCH PUBLIC DEBT ON JULY 31, 1926, AND FEBRUARY 29, 1928 (In millions of francs)		
Allocation	July 31, 1926	Feb. 29, 1928
<b>INTERNAL DEBT</b>		
Perpetual	101,676	101,740
Amortizable	48,644	77,579
Short term	42,262	25,757
Floating	94,197	77,018
<b>Total, internal debt</b>	<b>281,779</b>	<b>282,094</b>
<b>FOREIGN DEBT*</b>		
Commercial:		
United States	17,273	17,121
Great Britain	6,122	280
Netherlands	665	...
Argentina	452	300
Uruguay	197	79
<b>Total, commercial</b>	<b>24,609</b>	<b>17,780</b>
Political:		
United States	74,709	74,443
Great Britain	81,002	86,957
<b>Total, political</b>	<b>155,711</b>	<b>161,400</b>
<b>Total, foreign debt</b>	<b>180,320</b>	<b>179,180</b>

\* The official figures for the foreign debt are given in gold francs at the old parity. In the above table, they have been converted into the new franc created by the law of June 24, 1928, by using the coefficient 4.917.

Probably the outstanding event of post-war French finance was the stabilization of the franc on June 25, 1928. Until that date, the franc was worth 19.3 cents. Actually, however, the franc had, since December, 1926, been worth approximately four cents, and, in previous years, had declined to two cents. Its fluctuations were many and varied and worked a great hardship on many persons, particularly the holders of securities yielding a fixed income in francs. The stabilization law created a new monetary unit, still called the franc, but defined as 65.5 milligrams of gold 0.900 fine, or slightly more than one-fifth the former weight. The gold parity of the franc is 25.52 francs to the dollar, which corresponds very closely to its exchange value at the time the law was promulgated.

Aside from budget deficits and the increase in the public debt, the chief reason for the depreciation of the French currency in 1924 was the large note circulation of the Bank of France, as compared with the metallic reserve. In 1913 the average metallic reserve of the Bank of France was 3,342,800,000 francs in gold and 629,300,000 francs in silver, making a total of 3,972,100,000 francs. The average note circulation of the bank in the same year was 5,665,300,000 francs, making the percentage of metallic reserve to note circulation just over 70. On Dec. 21, 1927, the gold reserve in the bank was 3,681,000,000 francs, that held abroad, 1,864,000,000 francs and the silver reserve 343,000,000 francs, making a total reserve of 5,836,000,000 francs. On the same date, the note circulation was 56,551,000,000 francs, and the percentage of metallic cover to note circulation

10½. On Jan. 11, 1929, the gold reserve of the bank had risen to 33,709,000,000 francs, as compared with 28,935,000,000 francs at the time of stabilization on June 25, 1928.

Transportation. France is well provided with means of communication, internally by means of railways, rivers, and canals, and externally by the same means and also through harbors and ports and with the help of an extensive merchant marine. The length of navigable rivers and canals in 1925 was 6796 miles with a total traffic of 37,105,000 metric tons.

The French railway system comprises six private lines and one state line with a total mileage open for traffic in 1928 of 25,947 miles. This mileage was comprised as follows: State, 5629 miles; Nord, 2378 miles; Est, 3121 miles; Paris-Orleans, 4651 miles; Paris-Lyons-Mediterranean, 6091 miles; Midi, 2652 miles; Alsace-Lorraine, 1425 miles. The total receipts of the seven systems for 1928 was 14,576,975,000 francs and for 1927, 12,996,071,000 francs. For the latter year, the operating expenses amounted to 10,903,100,000 francs and fixed charges to 2,680,900,000 francs, the deficit for the year being 321,700,000 francs. By 1928, 716 miles of French railway had been electrified in pursuance of a settled policy. The State Railway had 66 miles in the suburbs of Paris electrically operated; the Orleans Railway, 144 miles, including 127 miles of the Paris-Vierzon Railway; the Paris-Lyons-Mediterranean Railway 16 miles from Chambéry to St. Pierre d'Abigny; and the Midi Railway about 500 miles. Statistics of railways in 1913 and 1926 are given in the accompanying table:

## STATISTICS OF PRINCIPAL RAILWAYS

		1913	1926	State, 1926	Private, 1926
Length of line	miles	24,573	26,872	6,907	19,965
Locomotives	number	14,150	20,942	5,888	15,054
Passenger cars	do	31,504	36,108	11,303	24,805
Freight cars	do	365,452	545,434	133,660	411,774
Passengers carried	thousands	541,342	800,957	269,286	531,671
Passenger miles	millions	12,000	17,635	4,409	13,226
Freight carried	1000 metric tons	204,321	319,542	83,940	235,602
Ton miles	millions	16,264	26,336	5,111	21,225
Train miles	thousands	161,805	274,257	62,904	211,353
Gross receipts*	1000 francs	2,039,706	18,378,320	2,971,672	10,401,648
Passenger service	do	662,513	8,038,375	653,197	2,380,177
Freight service	do	1,113,280	10,121,913	2,253,466	7,868,447
Gross receipts, equivalent \$1000		393,663	483,296	96,282	337,013

\* Including miscellaneous receipts not shown separately.

## MERCHANT MARINE (VESSELS OF 100 TONS OR OVER) YEARS ENDED JUNE 30

		1913	1923	1926	1927
Number of vessels					
Capacity	gross tons	1,552	2,021	1,769	1,752
Steam or other power	do	2,201,164	3,737,244	3,490,606	3,469,980
Sailing	do	1,793,310	3,452,940	3,324,397	3,361,679
		407,854	284,304	166,209	108,301

## ENTRANCES AND CLEARANCES OF VESSELS IN FOREIGN TRADE

		Entrances		Clearances	
		1913	1927	1913	1927
Number of vessels with cargo		27,918	27,503	21,661	24,781
Capacity (1000 net registered tons): Total		84,509	49,055	26,109	41,983
Bordeaux		2,007	2,315	955	1,390
Boulogne		3,478	4,089	3,273	3,346
Calais		1,225	1,060	749	792
Ocherbourg		4,593	10,726	4,582	10,635
Dunkirk		1,680	3,430	1,193	3,421
Havre		3,850	6,462	3,154	5,691
La Rochelle-Pallice		855	948	218	436
Marseilles		8,571	10,524	7,695	9,962
Rouen		2,285	2,439	377	646

France had witnessed considerable growth of air traffic, mileage of airways having increased from 3556 in 1921 to 6000 in 1925 and the mileage flown from 1,460,000 to 3,000,000. The passengers carried in 1921 numbered 10,619 and in 1925, 19,708. Freight by airplane had increased from 577,000 lbs. in 1921 to 2,092,000 lbs. in 1925 and mail from 77,000 lbs. in 1921 to 1,963,000 lbs. in 1925. See AERONAUTICS.

**History.** On Dec. 1, 1913, the moderate Barthou cabinet was overthrown and was succeeded by a ministry formed by Gaston Doumergue, whose Radical-Socialist Party filled seven of the twelve seats. Joseph Caillaux was the directing genius of the cabinet, but was kept from the premiership by the stigma of the Morocco settlement of 1911. He was made Minister of Finance. In view of the forthcoming elections, the cabinet chose to concentrate on his financial proposals rather than on the delicate question of reducing military service from three to two years, at the time the central issue with the Radical-Socialists. On that issue, nevertheless, the Radical-Socialists and Unified Socialists cooperated to form a pacifist bloc, in clear-cut opposition to the Federation of the Left which Barthou, Millerand, and Briand had organized with a programme of electoral reform and the Three Years Law. In the latter part of March, 1914, both Caillaux and his lieutenant, Monis, Minister of Marine, were forced to resign because of the shooting of Gaston Calmette by Madame Caillaux and the subsequent revelation of an old financial scandal. Meanwhile, the electoral campaign was on, centring for the most part around the Three Years Law. In the May elections, the Radical and Socialist bloc more than held its own, but the Doumergue cabinet, in accordance with custom, resigned before the meeting of the new Chamber, and a ministerial deadlock ensued in which a Ribot cabinet was smashed by the Radical-Socialist bloc within 24 hours after its formation. Finally, René Viviani succeeded in forming a cabinet based on a national-defense policy which received the Chamber's support.

While the French public was deeply absorbed in the sensational trial of Madame Caillaux during the latter part of July, President Poincaré, accompanied by Premier Viviani in his capacity as Foreign Minister, set out to visit France's ally, Russia. The Kronstadt Conference brought a further cementing of the alliance between France and Russia. The French statesmen returned to Paris on July 29, just after the Austrian ultimatum had been delivered to Serbia. When war between Russia and Germany seemed unavoidable, the German government requested of the French government a definite answer as to the attitude of France in case of a Russo-German conflict. In view of her alliance with Russia, France felt compelled to answer that she "would consult her interests." Orders for mobilization were issued in France and Germany on August 1, and two days later, war was declared by Germany on France. See WORLD WAR.

The French people received the news with patriotic fervor. Their outward calmness was marred, outside of a few minor occurrences, only by the assassination of Jean Jaurès, the great Socialist and pacifist, on July 31 by Raoul Villain, who acted under the influence of the extreme Royalists. Confronted with a situation which called for the greatest efforts and

sacrifices, the parliamentary factions abandoned all partisan strife and concluded a truce, known as the "Union Sacrée," to which even the Socialists subscribed. The draining of man power from all walks of life took place without friction and a financial panic was averted by a moratorium. Measures were taken to provide for the maintenance of an adequate food supply, and a rigid censorship was imposed.

With the rapid German advance threatening Paris, Premier Viviani resigned on August 26 and formed a more representative cabinet. General Gallieni, a capable and resolute soldier, was appointed military governor of Paris, but the danger became so great that the government moved to Bordeaux on September 2 and returned only in December, 1914. When Parliament reopened in Paris on Dec. 22, 1914, Premier Viviani passionately declared that France would not lay down her arms until Alsace-Lorraine was regained, Belgium restored, and Prussian militarism broken. Parliament criticized freely the conduct of the war, especially the handling of medical and munitions supplies by Millerand, Minister of War.

The Viviani government, however, withstood all attacks until Oct. 22, 1915, when the failure of its Balkan policy brought its downfall. A new coalition government was formed, by Aristide Briand, which included members of practically all political parties. Reports of lack of provision in the defense of Verdun in the spring and summer of 1916 brought a very stormy secret session of Parliament July 16-22, but the Government withstood all attacks, and the Battle of the Somme and the great diplomatic success of securing Rumania's entrance into the War on the side of the Allies prolonged its life. In December, 1916, Briand reconstructed his cabinet, giving the Ministry of War to General Lyautey (q.v.) but when the Chamber shortly afterward drove Lyautey from office and severely criticized Briand's economic policy, the cabinet resigned, on Mar. 17, 1917. The succeeding ministry under Ribot differed from the outgoing ministry only in that it contained as Minister of War a Radical-Socialist, Paul Painlevé, who on May 15, 1917, made important changes in the army command by appointing General Pétain commander-in-chief, in place of General Nivelle, and General Foch chief of staff at the War Office.

During the spring and summer of 1917, the seemingly interminable duration of the War and the terrible losses and sacrifices, coupled with grave economic troubles, seriously affected the morale of the French people and produced widespread war-weariness. The symptoms of this state of mind were "defeatism," industrial unrest, and mutinies at the front. Socialists increasingly took a stand of opposition to the War. Caillaux and other Radical-Socialist leaders, who had always more or less openly opposed the French war policy, were carrying on a campaign for a "White Peace," i.e., a peace without victory. The situation became so critical during the summer of 1917 that immediate energetic action seemed imperative to prevent a breakdown. During August, Georges Clémenceau made a vehement attack in the Senate on Minister of the Interior Malvy for the way in which he permitted the spread of defeatism and pacifism. This brought about the fall of Malvy on Aug. 31, 1917, and a week later that of the entire cabinet. Paul Painlevé succeeded Ribot



as Premier on September 12 and inherited all the troubles that beset the holder of this office.

Upon the speedy fall of the Painlevé ministry, Clémenceau assumed office and began to clean the Augean stable of treason and of neglect. He abandoned coalition and the political dilly-dallying of his predecessors and declared that he would pursue but one policy, that of vigorously prosecuting the War. In pursuance of this policy, he assumed, aside from the Premiership, the Ministry of War as the all-important cabinet post and filled his ministry for the most part with men who had been little before the public eye but who stood out for ability and energy and were thoroughly faithful to his policy. He put a speedy end to the defeatist campaign by ordering the arrest of its more important leaders. At the end of 1917, the prosecution of Caillaux was ordered, and the arrest of this former Prime Minister and leader of the great Radical-Socialist Party took place on Jan. 14, 1918.

A series of treason trials now followed in rapid succession. On February 14, the adventurer, Bolo Pasha, was condemned to death for using German money to invest in French newspapers for defeatist purposes. Other trials resulted in the execution of M. Duval, editor of the defeatist newspaper *Bonnet Rouge*, and Pierre Lenoir, and the imprisonment of many others, while Malvy, lieutenant of Caillaux and Minister of the Interior in five successive cabinets, was sentenced to five years' exile for "negligence equivalent to treason." Caillaux himself was not brought to trial until the spring of 1920. He was convicted of giving the enemy material aid but was exonerated of having guilty intentions, and was sentenced to two years' imprisonment, which he had already served, loss of civic rights, and five years' residence in an assigned district. The importance of these treason trials lies in the fact that they marked the temporary conclusion of a struggle, started long before the War, between the policy which aimed at a Continental concert under French and German leadership and that which looked toward a military victory over Germany and an entente with England.

Having checkmated the anti-war elements, etc., Clémenceau set to work organizing all energy in the country to prosecute the War. He refused to follow his predecessors in the policy of deceiving public opinion and stated to the country the sombre truth as to the military and political situation. He supplied the weakened army with new soldiers by drastically draining offices, factories, and fields of dispensable manpower. At the same time, he instituted rigorous measures to ensure an adequate food supply. His rationing system had not, however, the same success which similar measures had in Great Britain and Germany because of the disinclination of the French people to submit to strict alimentary discipline. Clémenceau also dealt sternly with the Socialist and Syndicalist opposition which raised its head during the summer of 1918. French morale improved steadily notwithstanding severe trials, such as the Parisians experienced during the bombardment and air raids in the spring and the summer of the last year of the War. If the desired end, military victory over Germany, was finally achieved, it was in no small measure due to the iron rule of Clémenceau.

Immediately after the Armistice, the politicians made a determined effort to reestablish the cabinet system and to divest Clémenceau of that one-man power which he had exercised during the War and which had enabled him to hold the country together till the final victory. In opposition to such designs, Clémenceau made clear in the debates in the Chamber during November, 1918, that he had no intention of giving up his powers as peace-maker and that, outside of a general outline, he would not take the whole country into his confidence in regard to his peace policy. In this attitude, he was sustained by the Chamber by a vote of 398 to 93. Clémenceau conducted the peace negotiations (see PEACE CONFERENCE) in secrecy, aided not by eminent French politicians but by his own faithful and trusted collaborators. This caused considerable resentment in Parliament. Moreover, able as Clémenceau had been as War Premier and as peace negotiator, he had failed in his economic and labor policies. Extremist agitation and the failure of the Government to remedy economic distress, and particularly the high cost of living, brought about a number of serious strikes during the first half of 1919. When the Peace Treaty came up for discussion in the Chamber in September, 1919, the Left censured the spirit of harshness in which it had been conceived, while the Nationalist deputies maintained that it did not go far enough in providing France with security, especially since Germany was permitted to retain the left bank of the Rhine. A rejection of the Treaty being out of the question, it was finally ratified by 372 votes against 52.

Great interest centred in the elections of 1919, the first since 1914. With the aid of Alexandre Millerand, Clémenceau organized an electoral phalanx, the National Bloc, composed of the more conservative parties, to combat Socialism and Bolshevism. The elections to the Chamber, held on Nov. 16, 1919, resulted in a decisive victory for the National Bloc and in a defeat for the Socialists and the Radical-Socialists. The balance of power was shifted from the Left and the Left Centre to the moderate Centre and the conservative Right. Moreover, since the two parties which had hitherto opposed anti-clerical legislation, the Progressists and the "Action Libérale," made the greatest gains, the election signified, for the time at least, a Catholic revival. It was quite evident from the results that the election was an expression of the spirit of the War and not of peace. The most important business before the new Parliament was the election of a successor to Raymond Poincaré as President of the French Republic. Clémenceau, though not eager, was induced to stand for election, but was defeated by Paul Deschanel in the Republican Caucus ballot which was held before the election. Thereupon, the National Assembly chose Deschanel by 734 out of 888 votes on Jan. 17, 1920. On the following day, the Clémenceau Ministry resigned, and Alexandre Millerand formed a new cabinet, in the composition of which he followed Clémenceau's example of choosing men of practical experience rather than brilliant politicians.

The new Government was soon called upon to deal with very serious strikes which began in February, 1920. These were caused by extremist sections in the French labor movement and were unpopular with the great mass of the

French people; they failed disastrously by the end of May, dealing a severe blow to the *Confédération Générale du Travail*. The chief aim of the Millerand government was the application of the terms of the Peace Treaty, and toward this end Raymond Poincaré was appointed President of the Reparations Commission on February 20. The successive Conferences at Boulogne, Spa, and Hythe produced very few results. The unsatisfactory trend of the Reparations policy engendered no little discontent in Parliament and Millerand might have had to contend with very strong opposition had it not been for the success of his labor policy and of his Polish policy. In accordance with the French post-war policy of erecting Poland as a strong "buffer" state between Russia and Germany in order to prevent a union of interest between these two former Powers, the Millerand government during the summer of 1920 gave successful aid to Poland in its struggle with Soviet Russia. The national approval accorded to this policy made, in conjunction with other factors, Millerand the logical candidate for the Presidency when President Deschanel was forced to resign on account of illness on Sept. 16, 1920. Millerand accepted the candidature and issued a statement declaring that, if elected, he would continue the same policy which he had pursued while Premier. He was duly elected on November 26 by 695 out of 892 votes and immediately thereafter let it be known that he intended to increase the powers of the presidential office and to assume a greater control over foreign affairs than his predecessors had done. A new ministry was formed by Georges Leygues, but this cabinet was clearly intended as a makeshift and gave way in the middle of January, 1921 to a cabinet under Aristide Briand.

The return to power of the parliamentary veteran Briand marked a revival of government by coalition and an attempt to modify the French Reparations policy and above all improve the somewhat strained relations with England. Ever since the Peace Conference, there had been gradually increasing disagreement between France and Great Britain (q.v.) as to the application of the terms of the Treaty. The French interpreted the English counsel for moderation as an attempt to whittle down France's share after England had been fully indemnified by the German colonies, markets and ships. They reasoned, moreover, that the English could well afford to be lenient with the Germans since England as a result of the Allied victory had been secured against any possible German aggression, while France, situated on the continent, had to reckon with a rapid recovery of a neighbor possessed of great powers of recuperation. Whatever the merits of this contention were, it produced on the part of the French public and government a tendency to use the policy of the strong arm in continental European affairs and it brought discord into the Franco-British relations. This estrangement was also fostered by other points of divergence in policy, such as Franco-British differences in the Near East, notably in Syria; the conflict between the French pro-Turkish and the British anti-Turkish policy; the British negotiations for resumption of trade with Soviet Russia and the vehement opposition of the French to Soviet Russia because of the Poles and the Russian debt; the refusal of the British to follow the French in giving unconditional

support to the Poles in the Danzig and Upper Silesian questions, etc. Briand made an earnest effort to remove the diplomatic friction between the two countries but from the outset he encountered the opposition of the conservative elements under the leadership of Poincaré. Further dissatisfaction in France was produced by the results of the Washington Conference at the end of 1921. See *WASHINGTON CONFERENCE*. By virtue of the fact that this Conference concerned itself chiefly with problems of the Pacific, France was placed at this meeting in a position of less importance than either the United States, Great Britain, or Japan. The Agreement on Naval Limitation, subscribed to by Briand, was felt to be disadvantageous to France. This discontent delayed the ratification of the Five Power Naval Treaty by France until July 7, 1923. The hostility toward Briand in the Chamber, resulting from what was considered his too conciliatory attitude, reached such intensity after the Cannes Conference, Jan. 6-12, 1922, that Briand deemed it best to resign (Jan. 12, 1922).

The reaction against Briand's policy brought Poincaré into office. The new Prime Minister stated from the outset that he preferred strong methods and the old diplomacy to conciliation and conferences and in consequence a distinct change for the worse took place almost immediately in Franco-British relations. Poincaré had inherited from his predecessor a pledge to attend the forthcoming Genoa Conference (Apr. 10-May 19, 1922), and, while refusing to go himself, he felt bound, in compliance with the obligation entered into by Briand, to send a delegation which was headed by Louis Barthou, the President of the Reparations Commission, as his personal representative. Owing to Poincaré's insistence that neither the Peace Treaty nor Reparations should be subject to discussion at the Conference, the Genoa meeting had at best only a moral effect.

The Hague Conference, held in June of the same year, which was intended to be a continuation of the Genoa Conference, likewise ended in failure, since no agreement could be reached with the Soviets. In the Turkish question, France found herself during 1922 often in a rather embarrassing position to Great Britain and it was only after the sweeping Turkish victory in August, 1922, that the two Powers recognized the harmful effects of their disagreement and arrived at more effective cooperation in regard to Turkey; but the Reparations problem, and the connected problems of the inter-Allied debts and of security for France, tended more and more to produce serious divergence of opinion between France and Great Britain, all the more so in view of Poincaré's reversion to strong methods at the close of 1922. At the conference with Great Britain, held in Paris during the opening days of 1923, Poincaré announced his intention of seizing from Germany productive guarantees with the view of holding them till Germany fulfilled her obligations under the Peace Treaty. Accordingly, French troops were ordered on Jan. 10, 1923, to occupy the Ruhr. See *REPARATIONS*.

This action not only caused anger abroad and among France's allies, but also evoked protests from the Left groups in the French Chamber. When it came to a showdown, however, the Chamber, with the exception of the Communists and some of the Socialists, supported Poincaré

in his venture. The Ruhr occupation involved a heavy drain on French resources and complicated still further the already very serious French financial situation. During his premiership, Poincaré strove with zeal to consolidate French military supremacy by encouraging the afterward discredited Separatist movement in the Rhineland and by cementing France's relations with the Little Entente (q.v.). The French policy toward the latter aimed at the building up of a wall of defense for France out of the succession states which had been constructed by the Peace Conference on the ruins of the former three great Powers of the European continent. By rendering political, military, and financial assistance to these new states, France bound them to her in close alliance and thereby sought to prevent the possible rise of these former Powers in challenge to her own hegemony on the European continent.

Meanwhile the failure of Poincaré's Ruhr and Rhineland ventures and the comparative isolation of France among the Powers resulting from his policy had greatly diminished his popularity at home. Already, during the summer of 1923, a number of by-elections had gone against the government and the Radical-Socialists and the United Socialists had formed the Bloc des Gauches for the purpose of offering a compact political organization in the forthcoming elections in opposition to Poincaré's and Millerand's Bloc National. Moreover, the Prime Minister was seriously embarrassed in the early spring of 1924 by a domestic crisis due to the dwindling of the value of the franc and the increase in the cost of living. Poincaré's proposal to meet the critical financial situation by an increase in the taxes amounting to 20 per cent, while credit to his courage, did not improve his chances in the impending elections. In the face of strong opposition, the Government's tax bill was carried on Feb. 22, 1924. Poincaré took drastic measures to stop the continued fall of the franc, but the currency crisis was not remedied until Morgan & Co. stepped into the breach with a loan. All these measures were used by the opposition against Poincaré in the Chamber and in the constituencies. When defeated on March 26 on an unimportant issue, Poincaré resigned but resumed office two days later with a reconstructed cabinet.

In regard to the Dawes Report of Experts, Poincaré after some hesitation signified his approval, but raised and left open the all-important question of "sanctions" in case of German default. He also refused to declare his willingness to evacuate the Ruhr. His attitude was, however, of less importance than formerly in view of the results of the elections on May 11, 1924, which indicated a defeat of the Bloc National by the Bloc des Gauches. The composition of the new Chamber was as follows: Conservatives, 11; Republican Entente, 137; Left Republicans, 92; National Radicals, 34; Radical Socialists, 127; Independent Socialists, 39; Unified Socialists, 101; Communists, 29. The government strength was roughly 274, while the opposition was able to muster at least 296.

The radical opposition immediately brought strong pressure to bear against Poincaré and Millerand. They aimed not only at the fall of the Poincaré government, which was a foregone conclusion, but at the resignation of President Millerand as well. They charged the President with having gone outside the non-

partisan sphere within which the President of the French Republic is confined by tradition and the spirit of Republican French government. The chief reason for their opposition to Millerand was, however, the fact that the latter was, in conjunction with Poincaré, the maintainer of the Nationalist policy inaugurated by Clémenceau during the War. Upon the assembling of the Chamber on June 1, the Poincaré government stepped out of office. Determined opposition, however, was encountered from President Millerand, who was not willing to relinquish his office without a serious fight. A tense parliamentary crisis ensued in consequence. Millerand attempted to gain time by appointing the stop-gap cabinet of François-Marsal, on June 8, but the radical opposition, which numbered by this time 307 deputies, would have no relations with it and forced it out on June 10. A message of the President was met by a vote of 329 to 214 in the Chamber and of 154 to 144 in the Senate in favor of the technical motion to adjourn all discussion of the message, whereupon President Millerand resigned his office on June 11. On June 12 the moderate Radical-Socialist Doumergue, President of the Senate, was elected President by 515 votes against 309 for the more advanced Radical-Socialist Painlevé, President of the Chamber, and two days later Herriot formed a Radical-Socialist cabinet. Since the Radical-Socialist Party, the party of Caillaux, was now in power, supported by the Socialists, and since the new Premier had been Caillaux's successor as the leader of this party, the change in the French government may reasonably be regarded as a step in the direction of the policy of Caillaux.

This development was signified by the immediate passage by the Chamber of an Amnesties Bill of broad scope with specific clauses under which the cases of Caillaux and Malvy could be included, although the Senate did not pass the bill until near the close of the year. With a narrow majority in face of the large Nationalist bloc in the Chamber, the Herriot government had to take into consideration the wishes of the Nationalists and could not at once abandon the Poincaré policy entirely. On the whole, the Bloc des Gauches in internal affairs favored chiefly reduction of taxes and of military service and a resumption of anti-clerical legislation, while in foreign affairs it stood for complete accord with England, a betterment of Franco-German relations through conciliatory methods on the part of France, for international as against isolated French action in regard to Reparations, and against the occupation of the Ruhr.

These foreign policies were clearly in evidence at the London Conference in July and August, 1924, which provided for the application of the Dawes Report, and for the time being removed the vexed question of Reparations from the field of discussion. Second in importance only to Reparations was the evacuation of the Ruhr, which the Allies promised would take place within a year if the Germans fulfilled their obligations under the Dawes Plan. Evacuation, in fact, began almost at once and by the end of the year was well advanced. A happy outcome of the conference was the reestablishment of the cordial understanding between France and England which had seemed on the point of vanishing before the advent of the two radical ministries. The Poincaré party naturally op-

posed the terms of the agreement, but Herriot was supported by substantial majorities in both houses of Parliament.

Various other policies of the Herriot ministry reflected its liberal character. French ports were opened to German shipping for the first time since the War. The government's match monopoly was reestablished. Military maneuvers due in the autumn were postponed. A strong supporter of the League of Nations, Premier Herriot personally attended the meeting of the League Assembly in September; and his ideas supplied the basis for the Geneva Protocol adopted there, providing for arbitration, mutual guarantees of security, and a future disarmament conference. On October 28, France extended recognition to the Russian government, stipulating that the old Russian debts to French bondholders were still considered valid by France and that there was to be no interference by either country in the internal affairs of the other. On December 4, Leonid Krassin was received as the first Soviet Ambassador to France. His arrival was made the signal for riotous demonstrations and for wholesale arrests on the discovery of an alleged revolutionary plot. While the opposition to these various measures was more or less pronounced, the real storm came over the decision to discontinue French representation at the Vatican, and other anti-clerical moves.

In Alsace-Lorraine, the Government proposed to put through a programme of secularizing the schools, all of which offered religious instruction of some kind. The old religious fires were rekindled and discussion raged throughout France. See *ALSACE-LORRAINE*. In September, the cardinals of France addressed a letter to the Prime Minister protesting against the action with regard to the Vatican and Alsace-Lorraine, as well as the Government's strict application of the laws suppressing religious orders. Herriot replied rather tartly. The bill suppressing the Vatican Embassy finally passed the Chamber Feb. 2, 1925, but Alsace-Lorraine was left with a special representative at Rome. The long religious controversy weakened the Herriot ministry, however, and contributed to its early downfall. It also alienated some of its supporters by the stand Herriot took toward the question of evacuating the Cologne area in accordance with Treaty provisions. In December, 1924, the Council of Ambassadors decided it could not carry out this evacuation because Germany had not kept faith in disarming, and on Jan. 28, 1925, Premier Herriot made a speech supporting that position and emphasizing the necessity of military security for France. While Parliament supported him, the Socialists were none too well satisfied. The troops were actually withdrawn a year later.

But the leading issue which led to Herriot's resignation was one which was to trouble France increasingly until it brought her to the brink of disaster. This was the highly critical state of French finances. Poincaré's efforts to check the depreciation of the franc early in 1924 had had only a temporary effect. Under the Herriot regime, with the extremists insisting on a capital levy and with increased taxes inevitable, the exodus of French capital became more pronounced than ever. Further falling-off in exchange and rise in living costs were the immediate results. To raise the thirty-three and one-half billion of francs called for by the 1925

budget, which was not passed until the spring of that year, the Government proposed an internal loan of 10 per cent on the country's entire wealth and an increase in the limits of note issue by the Bank of France from 41 billion to 45 billion francs. On this latter issue, the Government was defeated in the Senate and resigned, Apr. 10, 1925. On April 17, Painlevé formed a cabinet in which he retained for himself the position of Minister of War.

The formation of the new government was signalized by the return of Caillaux, who became Minister of Finance. He had long enjoyed the reputation of being almost a miracle-worker in finance and the country looked to him to find a way out of its difficulties. At the end of June, he proposed a further note issue of six billion francs and a loan to be used in part to consolidate the floating debt. He also turned his attention to the war debts which France owed to England and the United States. In August, he arranged in London a settlement of the former, conditional on the making of a similar agreement with the United States, and he then made a somewhat hurried visit to Washington. He was unable to agree on terms with the American commissioners. Returning to France with diminished prestige, he was eventually forced out of the cabinet on the capital levy issue (Oct. 27, 1925).

The Painlevé ministry itself survived only until November 22, when it likewise foundered on the rock of finance. It was succeeded by another Briand ministry with Louis Loucheur as Minister of Finance, but he soon gave way to Doumer, and when Briand reconstructed his ministry in March, 1926, Doumer's place was filled by Raoul Peret. All their efforts failed to stop the downward course of the franc. A committee of experts appointed in June made a number of recommendations which influenced the Government's later policies, but did not save the immediate situation. On June 15, Briand again resigned, but once more formed a cabinet, turning again to Caillaux for the post of Finance Minister. With the franc down to a value of about two cents United States currency, the situation became desperate. There was more and more talk of an overthrow of the Republic and the setting up of a dictatorship. On July 17, Caillaux requested dictatorial financial powers for a limited period but was refused by a vote of 288 to 243. Briand then resigned. Herriot formed a cabinet which lasted but a day or two. President Doumergue then called upon Poincaré to head a government of National Union, and he succeeded in forming such a coalition, with six former premiers in his cabinet. Parliament willingly rushed through the measures he desired, including notable increases in taxes on foreign trade, transportation, sales, property transfers, and foreign investments. As a result of these and other energetic measures, the franc rapidly recovered, public tension was eased, and the greatest crisis the country had faced since the War was passed.

During the remainder of the year, the financial position steadily improved. The budget for 1927 was approved well before the beginning of the year, a rare occurrence in modern French history. A discordant note came from the Left, which continually reminded Poincaré that he was put in control to stabilize the franc. As a matter of fact by December, 1926, the franc had attained a value of about four cents, and for

a year and a half it was actually, though not legally, stabilized at that figure. By the middle of 1928, the floating debt had been reduced, a gold reserve built up, and other requirements met and Parliament passed the bill which put France on a gold basis again with the value of the franc fixed at 8.92 cents, or 25.52 to the dollar. Premier Poincaré continued to enjoy the support of Parliament and the country, as evidenced in Senatorial elections on Jan. 16, 1927, and general elections Apr. 22 and 29, 1928. The latter were held under the new electoral law of July, 1927, by which deputies were elected separately by districts, as in the United States, instead of collectively by "lists."

While the domestic life of the nation was thus passing through dramatic phases, foreign affairs were somewhat more felicitous. As Foreign Minister, Briand pursued a course of his own which often fretted Poincaré but which he had to accept as the price of Radical support for his government. On Apr. 29, 1926, M. Bérenger, appointed Ambassador to the United States to succeed the veteran Jusserand, had come to an agreement with the American government on terms of settlement of the war debt which brought a vexed question one step nearer solution. The total debt was fixed at \$4,025,000,000. With increasing rates of interest, it was to be paid in 62 annual installments rising gradually from \$30,000,000 in 1926 to more than \$113,000,000 in 1927. Payments were to be made in gold or United States securities, and were not to be contingent on payments of reparations by Germany.

Strong objection to these terms developed in France, and continual efforts were made by the Government, urged on by public opinion, to have them modified. As the United States continued obdurate, French feeling became increasingly bitter toward that country. A growing anti-Americanism threatened to mount to serious proportions, when suddenly it was turned into an almost cordial goodwill by a dramatic and unheralded event. On May 21, 1927, Charles A. Lindbergh in *The Spirit of St. Louis* made his non-stop, 33-hour flight from New York to Paris. For weeks he was wildly acclaimed wherever he went, and the diplomats were quick to seize on the happy occurrence to bring again into being a friendly sentiment for America. See AERONAUTICS.

Opposition to the Mellon-Bérenger debt settlement nevertheless continued and found expression in various ways. It was felt by some American commentators that the feeling had much to do with the action of France in establishing a higher general tariff rate to apply to American imports among others, and at the same time concluding a tariff agreement with Germany (Aug. 17, 1927) under which certain imports would enjoy special rates. The United States protested vigorously, and France finally accorded American goods the same favors as German. Action upon the Mellon-Bérenger agreement was finally forced by the fact that \$400,000,000 which France owed the United States for war supplies was to come due Aug. 1, 1929. This amount was funded in the debt settlement, and if the agreement was ratified, immediate payment would not have to be made. Poincaré threw the whole weight of his ministry into the fight for ratification, staking the life of his government on the outcome, and on July 21, 1929, the Chamber approved the terms without reservations by a

majority of only eight votes. The Senate ratified the agreement, and the approval likewise of the Caillaux-Churchill agreement signed with Great Britain in 1926 was taken for granted. Owing to ill health, Poincaré resigned on July 26, 1929, and was succeeded by Aristide Briand, who formed a ministry representative of the different parties.

Among the achievements of Briand in the field of foreign relations, his coöperation with other European statesmen to bring into being the Locarno Pact particularly stands out. By this agreement, concluded in October, 1925, Germany was admitted to the League of Nations, her western boundaries were accepted, and mutual guarantees of security were given by the leading powers. France received the agreement in somewhat critical mood, but readily accepted it and accorded to Briand his full measure of prestige. The accord with Germany was still further strengthened by a commercial treaty, by conversations looking toward a *rapprochement*, and by the withdrawal of the Inter-Allied Commission of Military Control from Germany.

Relations with Italy were marked by some friction when French authorities at Nice, on Nov. 4, 1926, arrested Colonel Garibaldi and proved that he was acting for the Italian government in instigating anti-Fascist sentiment for its own purposes. The visit of an Italian squadron to Tangier in 1927 provoked some critical comment in France and in December of that year France signed a treaty of friendship with Yugoslavia, as an offset to the Treaty of Tirana between Italy and Albania.

Relations with Russia were marked by a certain tension because of the charges freely made that the Russian Embassy in Paris was being used as a centre for Communist propaganda. An incident apparently confirming these charges occurred in the middle of 1927 and resulted in the recall of the Russian Ambassador, Rakovsky. In 1925 the revolt of the kifi in Morocco under Abd-el-Krim for a while took on serious proportions, but he was eventually captured and banished to the island of Réunion. See MOROCCO. In the same year, a revolt in Syria culminated in the shelling of Damascus by General Sarraïl, bringing criticism at home and abroad.

Perhaps the most felicitous development of this period in the field of foreign relations arose almost casually, when Briand on Apr. 6, 1927, the anniversary of the entrance of the United States into the War, suggested a treaty between France and the United States outlawing war. Exchanges of notes developed the suggestion into a proposal for a multilateral agreement among the leading Powers. France at first deprecated the suggestion but widespread popular interest led Mr. Kellogg to follow it up, with the result that in 1929 the Kellogg Peace Pact, by which war was renounced as an instrument of national policy was signed by practically all nations.

The year 1929 saw also a great stride forward in settling the question of German Reparations. In September, 1928, Briand and Stresemann, German Foreign Minister, agreed to arrange for a committee of experts to determine a "final and definitive" settlement of the Reparations question. While the Dawes Report worked out a means by which Germany could pay reparations in given amounts, the actual total to be paid was left undetermined. Two experts from each



of the leading countries concerned were selected, Owen D. Young and J. Pierpont Morgan, being the unofficial delegates from the United States. They met in Paris on Feb. 11, 1929, and chose Mr. Young as chairman of the committee. After four months' work, they arrived at an agreement, signed June 7, 1929, by which the amount of German payments is definitely fixed over a period paralleling that in which the war debts are to be paid by European countries to the United States.

All France was plunged in mourning by the death of Marshal Foch, at the age of 77, on Mar. 20, 1929. See FOCH, FERDINAND.

**FRANCE**, frāns, ANATOLE (1844-1924). Pseudonym of Jacques Anatole Thibault, a French writer (see VOL. IX), who won the Nobel Prize for Literature in 1921. His later works include *La révolte des anges* (1914); *Sur la voie glorieuse*, addresses, etc. (1914); *Ce que disent nos morts* (1916); *Amycus et Célestin* (1916); *Le petit Pierre* (1918) and *La vie en fleur* (1922), both autobiographical; *Le génie latin*; *La Grèce et la paix* (1919); *Le Comte Morin, député* (1921); *Marguerite* (1921); *Les noces corinthiennes*, a lyrical tragedy with music by Henri Busser (1922); *Dernières pages inédites d'Anatole France*, published by Michel Corday (1925), and *Prefaces, Introductions, and Other Uncollected Papers* (trans. 1928). Nearly all of his works have been translated into English. Consult *Les théories sociales d'Anatole France*, by Maurice Gaffiot (1923); *Anatole France, the Man and his Work* by James Lewis May (1924); *Pensées d'Anatole France*, collected by M. Laussel and René Ledoux-Lebard (1925); *Anatole France Himself*, by his secretary, Jean Jacques Brousseau (1925); *La vie et les opinions d'Anatole France*, by Jacques Roujon (1925); *Anatole France and his Circle*, by Paul Gsell (1926); *Anatole France the Parisian*, by Leslie Stewart (1927); *Anatole France d'après ses confidences et ses souvenirs*, by Michel Corday (1927), and *Anatole France Abroad*, by Jean Jacques Brousseau (1928).

**FRANCHET D'ESPEREY**, frān'shā' dēs-per'ā, LOUIS FÉLIX MARIE FRANÇOIS (1856- ). A French marshal, born in Mostaganem, Algeria. He saw service in North Africa and elsewhere, and in 1913 was commander of the 1st Army Corps, doing distinguished service in attempting to hold back the German advance in the retreat from Mons, in September, 1914. He succeeded General Lanza in command of the 5th Army before the first battle of the Marne. In 1916 he was given command of the northern armies in France, in 1917 of the central armies, and in 1918 he was made Commander-in-Chief of the Allied Army in the Near East. He organized, and successfully carried out, a general attack of the armies which forced the Bulgarian armistice in September, took Belgrade in October, and forced Turkey and Hungary to capitulate in the same month. He was in charge of the Allied forces in Eastern Turkey and the Balkans in 1919, was created a marshal in 1921, and was a member of the Higher War Council and Inspector General of the African field troops. Consult *Le Maréchal Franchet d'Esperey*, by Alphonse Louis Grasset (1920).

**FRANCIS**, DAVID ROWLAND (1850-1927). An American merchant (see VOL. IX). He became United States Ambassador to Russia in 1916 and was the first representative of a foreign nation to recognize the new Republic of Russia.

He returned to the United States when the Bolsheviks gained control of the government.

**FRANCIS**, EDWARD (1872- ). An American pathologist born at Shandon, Ohio. Having received the degree of Sc.B. from Ohio State University in 1894, he studied medicine at the University of Cincinnati, graduating in 1897. Since 1900 he has been associated with the Hygienic Laboratory of the U. S. Public Health Service, in which capacity he has studied yellow fever, pellagra, filariasis, tetanus, undulant fever, and tularemia. He is best known for his pioneer work on the latter subject (see TULAREMIA). The American Medical Association awarded him its gold medal in 1928 for "his thorough and important scientific contributions to the knowledge of tularemia." In the same year, he contracted undulant fever while at work on that disease and was incapacitated for some months.

**FRANCK**, HARRY ALVERSON (1881- ). An American traveler and author, born at Munger, Mich. He studied at Michigan, Columbia, and Harvard universities in this country and did graduate work abroad. He is the author of *A Vagabond Journey around the World* (1910), *Four Months Afoot in Spain* (1911), *Tramping through Mexico, Guatemala, and Honduras* (1916), *Vagabonding down the Andes* (1917), *Vagabonding through Changing Germany* (1919), *Working North From Patagonia* (1921), *Wandering in Northern China* (1923), *Glimpses of Japan and Formosa* (1924), *Roving Through Southern China* (1925), *East of Sudan* (1926), and *The Fringe of the Moslem World*, (1928).

**FRANCKE**, KUNO (1885- ). A German-American scholar and author (see VOL. IX). He became professor emeritus and honorary curator at Harvard in 1917 and was president of the Modern Language Association of America (1917). He wrote *A German-American Confession of Faith* (1915); *The German Spirit* (1916); *Personality in German Literature before Luther* (1916); *Die Kulturwerte der Deutschen Litteratur von der Reformation bis zur Aufklärung* (1922); *Die Kulturwerke der Deutschen Litteratur in Ihrer Geschichtlichen Entwicklung* (1923); *Kant and Art* (1925), and *German After War Problems* (1927).

**FRANÇOIS-MARSAL**, frān'swā-mār'sōl', FRÉDÉRIC (1874- ). A French public official, military man, and financier who was educated at the Lycée Louis-le-Grand and at Saint-Cyr, the French military academy. After serving in the army, as a member of the governor general's cabinet in Indo-China, and in the banking world, he entered the Senate in 1919 as a Union-Republican. Early in the following year, he became finance minister under Millerand and Leygues (until Jan. 12, 1921), and again under Poincaré (Mar.-June, 1924), when he floated the peace loan of 1920 and took measures to consolidate the floating debt of 70,000,000,000 francs (1924) of the French Republic. On the fall of Poincaré with the radical victory in the elections of 1924, President Millerand chose François-Marsal as premier (June 9-13), but the radical majority in the Chamber refused to accept a cabinet named by Millerand. Both Millerand and François-Marsal resigned and Herriot became premier. François-Marsal remained a leader of the opposition and was influential in causing Herriot's downfall. He was president of the International Colonial Institute (1927-

29), and wrote *Trois mois au Rouang-Si*, as well as books and articles on finance and political economy.

**FRANK, BRUNO** (1887- ). A German writer, poet, and dramatist, born at Stuttgart. His plays, noted for their psychological study of social problems, include *Die Schwestern unter der Fremde* (1918), and *Das Weib auf dem Tiere* (1921). He also wrote the novels *Die Fürstin* (1915); *Der Baron Trenck* (1926, Eng. trans., 1928); and the biography, *Tage des Königs* (Frederick the Great, 1924).

**FRANK, GLENN** (1887- ). An American publicist and university president, born at Queen City, Mo., and educated at Kirkeville State Normal School and at Northwestern University (1912). He was editor-in-chief of the *Century Magazine*, 1921-25. Since 1925 he has been president of the University of Wisconsin. He published *The Politics of Industry* (1919), *An American Looks at His World* (1923), and *Thunder and Dawn* (1928), studies in the outlook of Western civilization. He was co-author of *The Stakes of the War* (1918), and *The League of Nations—The Principle and the Practice* (1919).

**FRANK, REINHARD** (1860- ). A German jurist and privy councilor, born at Reddighäuser Hammer, and educated at the universities of Marburg, Munich, and Kiel. In 1887 he became lecturer at Marburg, and subsequently held professorships at Giessen (1890), Halle (1900), Tübingen (1902), and Munich (1914). In 1920-21 he was rector of the University of Munich. His numerous publications include *Wolfsche Strafrechtsphilosophie und ihr Verhältnis zur Kriminalpolitischen Aufklärung im Achtzehnten Jahrhunderts* (1887); *Naturrecht, Geschäftliches Recht und Soziales Recht* (1891); *Strafrechtliche Fälle zu Akademischem Gebrauch*, 5th ed. (1912); *Schutzstrafe und Vergeltungsstrafe* (1908); *Die Belgische Neutralität* (1915); *Kann Wilhelm II Ausgeliefert Werden?* (1910); and *Sinn und Tragweite des Auslieferungsgesetzes* (1920). He became editor of the *Vergleichende Darstellung des Deutschen und Ausländischen Strafrechts* and the *Pitaval der Gegenwart*. He was also made a member of the *Kommission für das Strafgesetzbrauch*.

**FRANKFURTER, FELIX** (1882- ). An American lawyer and educator, born at Vienna, Austria. He came to the United States in 1894 and in 1902 graduated from the College of the City of New York. He studied law at Harvard and from 1906 to 1910 was United States Attorney of the Southern District of New York. After 1914 he was professor of law at the Harvard Law School. During the World War, he acted as major and judge-advocate, and as secretary and counsel of the President's mediation commission. In 1918 he was appointed chairman of the War Labor Policies Board. He was also a member of the board of directors of the Institute for Government Research, and was the author of *Cases Under the Interstate Commerce Act* (1922), *Oregon Hours of Labor Case* (1923), *District of Columbia Minimum Wage Cases* (1923), and *The Case of Sacco and Vanzetti* (1928).

**FRANKLIN, EDWARD CURTIS** (1862- ). An American chemist, born at Geary City, Kan., and educated at the Universities of Kansas, Berlin, and Johns Hopkins. He was an assistant in chemistry at the University of Kansas, where in 1899 he attained the chair of physical chemistry. In 1903 he was called to the associate

professorship of organic chemistry in Leland Stanford, Junior, University, where in 1906 he became full professor. He was professor of chemistry with the hygienic laboratory of the United States Public Health Service (1911-13), physical chemist of the Bureau of Standards (1918), and held similar posts with other government advisory boards. His original investigations, published in chemical journals, have had to do with liquid ammonia as an electrolytic solvent, the ammonia system of acids, bases, and salts, and various other preparations of which ammonia is an important constituent.

**FRANKLIN-BOUILLON, HENRI** (1870- ). A French diplomat and public official, born on the Island of Jersey. He was elected a Radical-Socialist deputy to the French Parliament in 1910 and during the World War was chairman of its committee on foreign affairs, establishing the "committee for parliamentary action abroad" through which French war propaganda in Austria, the Balkans, and the Orient was directed. As French representative in Angola in 1921, he negotiated the treaty establishing peace with Turkey. After 1924 he was again president of the parliamentary committee on foreign affairs and played a leading part in the debates on reparations and war debts. See **TURKEY**.

**FRANKLIN COLLEGE**. A coeducational institution at Franklin, Ind., founded in 1834. The number of students increased from 206 in 1914 to 309 in the autumn of 1928, at which time the faculty numbered 28, and the volumes in the library 31,000. The endowment increased from \$312,500 in 1914 to \$860,000 in 1928, and the income from \$49,498 to \$108,918 in 1927-28. Between 1914 and 1924, departments of Biblical literature, sociology and economics, and art, were established; and between 1924 and 1928, new departments of music and public speaking were added to the curriculum; a science building was completed; and a new liberal arts curriculum, largely prescribed for the first two years and elective for the last two, was put into effect. President, Homer Price Rainey, A.M. Ph.D.

**FRANZ, SHEPHERD IVORY** (1874- ). An American psychopathologist (see **VOL. IX**), attached to the United States Government Hospital for the Insane. He edited the *Psychological Bulletin*, 1914-24, and was associate editor of *Psychobiology*. He was a member of the Psychology committee of the National Research Council in 1917 and president of the American Psychological Association in 1920. In 1925 he was appointed professor of psychology in the University of Southern California. In 1923 he published *Nervous and Mental Reeducation*.

**FRANZEN, AUGUST** (1863- ). An American portrait and genre painter (see **VOL. IX**). He became a member of the National Academy of Design in 1920 and was awarded the Academy's Portrait Prize in 1924.

**FRASER, JAMES EARLE** (1876- ). An American sculptor. He was born at Winona, Minn., and studied at the Art Institute in Chicago and at the École des Beaux Arts and Colarossi and Académie Julian, Paris. He was assistant to Augustus Saint-Gaudens and won the first prize in sculpture awarded by the American Art Association, Paris, in 1898, and many medals. Among his best-known works are the bust of Theodore Roosevelt in the Senate Chamber at Washington, the monument to Bishop Potter in the Cathedral of St. John the Divine,

New York, the monument to John Hay at Cleveland, "The End of the Trail" in Tulare County, Calif., the bust of Saint-Gaudens in the Hall of Fame, New York University, the portrait bust of Elihu Root, and the groups "Discoverers" and "Pioneers" for the Memorial Bridge at Chicago. He has been instructor at the Art Student's League, New York, since 1906. He was president of the National Sculpture Society in 1925-26 and became a member of the National Academy of Design in 1917.

**FRAZER, SIR JAMES (GEORGE) (1854- )**. A British anthropologist and folklorist (see VOL. IX). He received the Order of Merit (1925). His work, *The Golden Bough*, originally published in 2 volumes in 1890, rewritten and expanded to 12 volumes (1911-15), was republished in an abridged edition in 1922. He is also the author of *The Belief in the Immortality and the Worship of the Dead* (vol. i, 1913; vol. ii, 1922; vol. iii, 1924); *Essays of Joseph Addison, chosen and edited with a preface and a few notes* (1915); *Folklore in the Old Testament* (1918, abridged ed. 1923); *Sir Roger de Coverley and Other Literary Pieces* (1920); *Apollodorus, with an English translation* (1921); *Sir Ernest Renan* (1923); *The Worship of Nature* (vol. i, 1926), *The Gorgon's Head, and Other Literary Pieces* (1927); and *Man, God, and Immortality* (1927).

**FRAZER, JOSEPH CHRISTIE WHITNEY (1875- )**. An American chemist and educator, born at Lexington, Ky. He graduated from the Kentucky State University in 1897 and took post-graduate courses at Johns Hopkins. From 1901 to 1907, he was assistant and associate in chemistry at that university, and from 1907 to 1911 was chemist at the United States Bureau of Mines. In 1911 he became professor of chemistry at Johns Hopkins, and in 1921 B. N. Baker professor. He has conducted researches on osmotic pressure and vapor tension of solutions, catalysis, and the chemical behavior of surfaces.

**FRAZIER, LYNN JOSEPH (1874- )**. A United States Senator, born in Steele County, Minn., who was graduated from the University of North Dakota in 1901. A farmer by occupation, he was elected Governor of North Dakota for the term 1917-18, 1919-20, and 1921, but was recalled in 1921. He was elected U. S. Senator as a Republican for the term 1923-29 and reelected for the term 1929-35. He was a member of the group of Republican senators headed by Senator George W. Norris of Nebraska who frequently opposed Administration measures.

**FREDERICK, PAULINE (MRS. C. A. RUTHERFORD) (1885- )**. An American actress, born in Boston. She made her debut in New York in 1902. She played in many Broadway productions including *Innocent* and *Don't Shoot* and made her screen debut in *The Eternal City*. She later appeared in film versions of *Zaza*, *Tosca*, *The Woman on the Index*, *Bonds of Love*, *The Paliser Case*, *Madame X*, and *The Glory of Clementina*. She reappeared on the dramatic stage in 1923 in *The Guilty One*.

**FREDERICQ, frâ/de-rêk, PAUL (1850-1920)**. A Flemish historian (see VOL. IX). The German government exiled him from Belgium during the World War because of his activity in strengthening the morale of the Belgians. After the Armistice, he was appointed rector of Ghent University, but weakness from imprisonment

caused his death. He was a member of the Académie Royale de Belgique and the Académie des Pays-Bas.

**FREEMAN, EDWARD MONROE (1875- )**. An American botanist, born at St. Paul. He graduated from the University of Minnesota in 1898 and did graduate work there and at Cambridge. He became professor of botany and plant pathology at the University of Minnesota in 1908 and has been dean of the College of Agriculture, Forestry, and Home Economics at that university. Professor Freeman is the author of *Minnesota Plant Diseases*.

**FREEMAN, LEWIS RANSOME (1878- )**. An American author, born at Genoa Junction, Wis., and educated at Leland Stanford, Junior, University. He spent much of his time in traveling and as foreign war correspondent, with the British, French, and Italian armies (1915-17) and in Germany (1918). He wrote *Many Fronts* (1918), *Stories of the Ships* (1919), *Sea Hounds* (1919), *To Kiel in the Hercules* (1919), *In the Tracks of the Trades* (1920), *Hell's Hatches* (1921), *The Yellowstone to New Orleans* (1922), *When Cassi Blooms* (1922), *The Colorado River* (1923), *Down the Grand Canyon* (1924), *On the Roof of the Rockies* (1925), *By Water Ways to Gotham* (1926), *Water Ways of Westward Wandering* (1927), *The Nearing North* (1928).

**FREEMAN, ROBERT (1878- )**. An American clergyman, born in Edinburgh, Scotland. After engaging in mission work in Pennsylvania and New York for four years, he was ordained in the Baptist ministry in 1900; thereafter he held various pastorates until 1910. Since 1911 he has been pastor of the Pasadena, Calif., Presbyterian Church. He was moderator of the Synod of California in 1920-21. During the World War, he directed the first expeditionary division of the Y. M. C. A. and in 1917-18 was director of religious work in France. He is author of *The Hour of Prayer* (1914), *The Land I Live In* (poems, 1921), and *New Every Morning* (1927).

**FREE VERSE**. See LITERATURE, ENGLISH AND AMERICAN.

**FRENCH, DANIEL CHESTER (1850- )**. An American sculptor (see VOL. IX). He was awarded a medal of honor at the Panama-Pacific Exposition, in 1915, and a gold medal of honor by the National Institute of Arts and Letters, in 1918. From 1910 to 1915, he was a member of the National Commission of Fine Arts. His work after 1914 includes "Sculpture" (marble, St. Louis Museum); figures symbolic of Manhattan and Brooklyn on Manhattan Bridge; "Memory" (marble, Metropolitan Museum, New York City), his finest female nude; a statue of Lafayette, Easton, Penn.; the Dupont fountain, Washington, D. C.; and especially, a colossal bronze "Lincoln" for the Lincoln Memorial at Washington. Consult *Memories of a Sculptor's Wife*, by Mrs. Daniel Chester French (1928).

**FRENCH, JOHN DENTON PINKSTONE, FIRST EARL OF YPRES (1852-1925)**. A British field-marshal (see VOL. IX). He commanded the British forces in France from the beginning of the World War until December, 1915. On his resignation, he was made Viscount French of Ypres and High Lake and commander-in-chief of the United Kingdom, holding that post till May, 1918, when he was appointed Lord Lieutenant of Ireland. He resigned in 1921 and was made

an earl on returning to England. He received many honors from European governments and in 1920 was given the Freedom of the City of London and a sword of honor. See WAR IN EUROPE, under *Western Front*.

**FRENCH EQUATORIAL AFRICA.** A French possession in west-central Africa comprising the colonies of Gabun, Middle Congo, Ubangi-Shari, and Chad. Its area is estimated by the French at 912,649 square miles, excluding the Cameroon (See CAMEROON), of 166,489 square miles, which forms a separate colony joined to Equatorial Africa. By the census of 1926, it had a population of 3,127,707, of whom 2502 were whites. The largest cities had the following populations: Libreville, 20,000; Brazzaville, 40,000; Fort Lamy, 10,000. The tropical products continued the sources of economic wealth. Caoutchouc, lumber, ivory, palm kernels, palm oil, were the principal exports in 1926. Coffee and cacao were beginning to receive attention. Large herds of cattle, sheep, camels, horses, and ostriches were the property of the natives, but the lack of transportation eliminated them from the export trade. In 1927 total exports were 136,747,844 francs as compared with 21,181,768 francs in 1913. Imports in 1927 were 172,319,683 francs, as compared with 21,181,768 francs in 1913. The fall of the franc after the World War made the actual decrease in trade greater. In February, 1921, a line was commenced from Brazzaville to the Atlantic Ocean (300 miles). It is expected to be finished in 1930. The general budget in 1929 called for an expenditure of 54,500,000 francs. The four colonial budgets included expenditures of 53,740,000 francs. Colonization has been tardy because of the difficulties of transport. To hasten the country's settlement, the French Chamber passed, in 1920, a measure calling for the expenditure of 171,000,000 francs on railway, port, road, telegraph, and river developments. These improvements are being carried out gradually.

**FRENCH ESTABLISHMENTS IN INDIA.** Five provinces in India belonging to the French empire. These are Pondichéry (187,406 inhabitants in 1928), Karikal (57,488 population), Chandernagore (25,830 population), Mahé (11,706 population), Yanam (Yanaon, 4743 population). Total area, 196 square miles; total population, 287,173. The chief towns are Pondichéry (47,999), Oulgarret (24,518), and Villenour (21,774). Principal products are rice, sugar cane, cotton, manioc, cacao, coffee, ground-nuts. Imports in 1927 were 10,795,928 rupees; in 1913, 10,837,115 francs. Exports for 1913, were 43,720,095 francs, for 1927, 28,630,790 rupees. The budget for 1928 was 2,757,550 rupees.

**FRENCH ESTABLISHMENTS IN OCEANIA.** See PACIFIC OCEAN ISLANDS, under *Society Islands*.

**FRENCH GUIANA.** See GUIANA.

**FRENCH INDO-CHINA.** The general name for the French possessions in southeast Asia. It is made up of the following units: (1) Colony of Cochin-China, 26,476 square miles; population in 1926, 9,119,832; of which 13,452 were Europeans; largest city, Cholon, 198,713 population. (2) Protectorate of Annam, 39,758 square miles; population in 1926, 5,580,974, of which 2584 were Europeans; largest city, Binh-Dinh, 147,199 population. (3) Protectorate of Cambodia, 67,550 square miles; population in 1926, 2,535,178, of which 1901 were Europeans; largest city, Pnôm-Penh, 81,712 population.

(4) Protectorate of Tonking, 40,530 square miles; population in 1926, 7,401,912, of which 9143 were Europeans; largest city, Hanoi, 103,235 population. (5) Protectorate of Laos, 82,604 square miles; population in 1926, 855,146; largest city, Vientiane. (6) Kwangchow Wan territory, 190 square miles; population, 205,000. Total area, 274,385 square miles; total population in 1927, 19,999,423 (18,000,000 estimated in 1914); number of Europeans, 34,443. The activities are largely agricultural, the country being one of the most important rice districts in the world. Cinnamon, sugar, and tea were also grown in central Annam. Minerals mined were coal and lignite, antimony, tin, wolfram, iron, and zinc. Cotton is becoming important in Cambodia. In 1926 total exports were 3,033,440,986 francs; imports, 2,641,945,471 francs. Leading imports are cotton tissues, cotton thread, iron and steel, machinery, and mineral oils.

In 1926, 878 ships of 1,959,577 tons entered the port of Saigon, Cochin-China. Other ports, though of less importance, were Tourane (Annam), Haiphong (Tonking), and Kwangchow Wan. Railways in 1927, 1485 miles. The general budget for 1927 balanced at 97,500,000 piastres, though excesses, never less than 7,000,000 piastres, occur annually. The debt of Indo-China in 1926 was 434,209,000 francs. Local budgets for the separate areas totaled 62,137,159 piastres in 1927. Money in circulation June 30, 1927, 149,412,000 piastres.

In 1918 and 1920, new codes of law were promulgated, while educational progress steadily made headway. In 1917 the various technical and professional schools were united to form the University of Indo-China and in 1918, a European college was opened at Hanoi. During the World War, France was able to draw upon the region for troops, money, boats, provisions, and raw materials.

**FRENCH LITERATURE.** French literature, after the outbreak of the World War in 1914, quite naturally must be divided into two periods, the WAR PERIOD, and the POST-WAR PERIOD.

From January to August, 1914, the literary world had remained untouched by the momentous political events; i.e., the movement started during the preceding decade had continued normally, namely: away from dilettantism, æstheticism, skepticism, and cynicism, toward social reform, national traditionalism, and Catholicism. For example, in poetry, Péguy's *Eve*; in prose, M. Barrès's *Grande Pitié des Eglises de France*; Juliette Adam's *Chrétienne*—(to refute her own *Païenne* of some years before); E. Baumann's *Le Baptême de Pauline Ardel*; also Lichtenberger's *Le Sang Nouveau* (the blood of those who are going to win the war), and J. des Gâchons's *Vive la Vie!* On the stage, Claudel had scored once more, with *L'Otage*, of the most consistent Catholicism; while Curel, *La Danse Devant le Miroir*, and Croisset in *L'Épervier* had described the hyper-sensitive soul of the generation; and Sacha Guitry affected the tone of indifference which he—one among very few indeed—was going to keep up all through the War.

Now let it be recalled at once, that in France especially, the war period in literature did not stop in November, 1918; it lasted until about the end of 1921, since which time only, one can truly say that the effects of the crisis are no longer the primary element of inspiration; neither did they ever stop altogether; we shall

mention under *War Literature* all books related to the subject to the close of 1928.

**War Literature.** With the first cannon shot, all, even periodical, literature stopped for several weeks, except the *Revue des Deux Mondes*, *L'Illustration*, and *Revue Hebdomadaire* (the latter in form of a newspaper); and *Le Temps*, *Les Débats*, *Le Matin*, *L'Echo de Paris*—but they contained articles from the pens of masters, like Barrès (*Echo de Paris*), Maeterlinck, Lavedan, Doumic, Gourmont, Maurras, Masson-Forestier, etc.

Promptly, as soon as the rear was somewhat reorganized, this war prose came out in book form. Some of the most noteworthy of these collections of articles are Barrès, the series *L'Âme Française et la Guerre* ("Union Sacrée" "Saints de France" "Croix de Guerre", etc.); Lavedan, *Grandes Heures*; A. France, *Sur la Voie Glorieuse*; Loti, *La Grande Barbarie*; Maeterlinck, *Débris de Guerre*; P. Adam, Maurras, Abbé Wetterlé (*Propos de guerre*, etc.), the Socialist Hervé (*Après la Marne, La Patrie en Danger*). Marcelle Tinayre, *La Veillée des Armes* will remain as one of the fine books of the great first hours of the War. Then in 1915 Romain Rolland published in book form his much resented *Au-Dessus de la Mée*, of Tolstolian or pacifist inspiration, a note sounded again in *Le Temps viendra* (1921). In the course of the year 1916, the first soldier diaries began to appear, preceded by the gallant, but hardly very trustworthy volume of fiction *Gaspard*, by René Benjamin. One after the other they came out, especially in 1916, these books which will remain as a stirring testimonial to the horrors of the World War: Paul Lantier, *Ma Pièce*; *Lettres d'un Soldat* (by the painter Lemerrier, but published anonymously); Rédier, *Méditations dans la Tranchée*; Genevoix, *Sous Verdun*; etc. The year 1917 brought Jean des Vignes Rouges's *Bourru, Soldat de Vauquois*, one of the notable war books, Adrien Bertrand's *Appel du Sol*, Marcel Nadaud's *Ohignole*, a remarkably alert account of military aviation; and also, the same year the much discussed *Le Feu* came out, written by Barbusse. (The chief objection to it in France was that it was spreading discouragement at a time when all needed so much courage.) Finally, the year 1917 was also the year of Duhamel's *Vie des Martyrs* (later followed by *Possession du Monde*, the Goncourt prize for 1918); Duhamel's books were translated into many languages; he is one of the great number of writers whom the War revealed to the public, and one of the very few who remained really famous after the war. For others who distinctly forced public attention by their forceful description of the war, we will just give a few names here and refer for titles to the bibliographies named below: Dieterlen, Péricard, Le Bail, Dupont, Tuffrau, Belmont (*Lettres*), Erlande, Milan, Franconi, Binet-Valmer, Malherbe (Goncourt Prize 1917 for *Flamme au Poing*), Fribourg (*Croire*), Giraudoux, Fonck, Pirenne (a Belgian, *Vainqueurs de l'Yser*). The fourth year of the war was at hand, and while the diaries became less numerous, they were often more bitter; e.g., Léon Werth (*Clavel soldat*), M. Berger (*Jean Darboise, auxiliaire*), Barbusse (*Ôlarté*). Of the many decidedly superior war books since the close of the War, a few of the best are R. Dorgeles' *Croix de bois* (1920), Girard, *Les Vainqueurs* (1924), and L. Delteil, *Les Poilus* (1926), which was much discussed. Some sad stories are told

by Zavie, *Prisonnier en Allemagne*, Hennebois, *Journal d'un Grand Blessé*, Blanche, *En Représailles*, Max, *Mes Six Évasions*.

Among the books which relate war achievements but were written by noncombatants, a few must be mentioned here: Le Goffic, a series of volumes the first of which is *Diamude, un chapitre de l'Histoire des Fusiliers marins*; H. Bordeaux, *Les Derniers jours du Fort Vauv*, and *Les Prisonniers délivrés*. Jean de Pierrefeu (who gave out the daily war bulletins), *Au G. Q. G. (Grand Quartier Général)*; M. A. Leblond, *Gallieni*; then Bédier's sober and impressive *L'Effort Français*, and Madelin's *Verdun*.

Here may be added a reconstitution of the phases of the War by Dumur, in his trilogy in Zola style: *Nach Paris, Boucher de Verdun, Les Défaitistes*; and in 1928, by the same, a very realistic reconstruction of the Rasputin episode, *Dieu protège le Tsar*. Books not dealing directly with the War and the army, but with events in the rear of the fighting zone and yet remarkable, are Isabelle Rimbaud, *Dans les remous de la bataille*; Donnay, *Lettres à une Dame Blanche* (Red Cross); Géraudy, *La Guerre, Madame . . .* (one of the most widely read for some time); Blanche, *Cahiers d'un Artiste*. It was in 1918 that the since very popular André Maurois earned his first laurels with the witty picture of the English in France during the War in *Les Silences du Colonel Bramble*.

When the War and victory exaltation came to a standstill, several talented authors endeavored to have the country realize the problems of reconstruction; such are, in 1920, Parmentier in *L'Ouvrage*; in 1921, Claude Anet in *Quand la Terre trembla*; in 1923 R. Dorgeles in his *Le Réveil des Morts*; and Pierre Hamp in his series of *Les métiers blessés*.

Of the works of fiction, that is, the novels, which, without depicting actual war episodes, take the War as background, these are a few samples: Bourget's *Le Sens de la Mort* and *Lazarine*; Prévost, *Adjudant Benoît*; Rosny, *L'Enigme de Gwreuse* and Giraudoux, *Stegfried et le Limousin* (two cases of double personality in a soldier); Bazin, *Les Nouveaux Oberlé*, about Alsace (1919) and *Baltus, le Lorrain* (1926); Estaunié, *L'Appel de la route*; Villetard, *Mon-sieur Bille dans la Tourmente*; Foley, *Sylvestre et son Blessé*; Colette Yver, *Mirabelle de Pampe-lune* (and other stories), *Les Cousins Riches* (the Americans); Marcel Boulenger, *Charlotte en guerre*. Some humorous stories: De la Foucardière, *Scipion Pégoulade* (a sort of Tartarin de Tarascon); M. Prévost, *Mon cher Tommy*; Boissière, *L'Extravagant Teddy de la Croix Rouge anglaise*; Dekobra, *Sammy, Volontaire Américain*; Valmy-Baisse, *Le Retour d'Ulysse*.

Short stories were published in fabulous number among which are *Contes véridiques des Tranchées*, by many "poilus," and collections by Arnoux, Bazin, Bordeaux, Farrère, Pawloski, Gus-Bofa, Frapié, and Mille.

The theatre of the war period is not extremely important. At first, old plays exalting devotion to the mother-country provided what was needed: Cornille's *Horace*, Sophocles *Œdipe roi*, Bornier's *Fille de Roland*, Sardou's *Patrie*, Kistemaeker's *Flambée*, Lavedan's *Servir*. Then early in 1915 new plays began to appear: Fronson's *Kommandantur*, depicting the invasion of Belgium (Fronson is a Belgian); Donnay's charming *Impromptu du Paquetage*; Claudel's *Nuit de Noël*; E. Morand's



*Les Cathédrales*, spectacular mourning over Rheims and Strasbourg especially. In 1916 Bataille gave an unpleasant description of the effect of war on women in *L'Amazone*; while Hennique and Veber offered a cheerful two-act vaudeville *Le Poilu*. In 1917 came Bernstein's *Élévation*, hailed by many as the most stirring war play produced; Farrère and Népote offered *La Veillée des Armes*. In 1918 Kistemaker wrote *Un Soir au front*, and Maeterlinck, *Bourgeois de Stilemonde* (which was first presented in America). In 1919 there was F. Porché's very ingenious and successful allegorical *Les Butors et la Finette*; in 1920, the exquisite *Maison du Berger* by Fleg; the opportune (or inopportune) *Les Américains*, by Brieux; and the two plays—both painful for different reasons—Donnay's *Chasse à l'homme*, and Méré's *Les Captives*. In 1922 F. de Curel scored with *Terre Inhumaine*.

In the domain of poetry, again relatively few collections can be recorded as absolutely above par. It would not be right to leave unnoticed Botrel's *Chants de Rosalie* ("Rosalie" was the bayonet), *Chants du Bivouac*, *Chants de Route*; he was called the bard of the trenches; and Claudel, *Trois Poèmes de Guerre*. In 1916: Bataille, *La Divine Tragédie*; Zamacoïs *L'Ineffaçable*; Paul Fort, *Poèmes de France*; and especially Verhaeren, *Les Ailes Rouges de la Guerre*. In 1917: The exquisite *Couronne douloureuse*, by H. Ghéon; and two of the most popular productions—rightly so—L. Mercier, *Prières de la Tranchée*, and the instantly famous *La Passion de notre Frère le Poilu*. In 1918 came out the very striking poems, *Nous . . . de la Guerre*, by Henry Jacques; and Mme. Delarue Madrus, *Souffles de Tempête*; in 1919 Rostand's *Vol de la Marseillaise*; and J. Suberville's strong *Fibre de Bernadotte* and *Fosse aux Lions*. In 1921 F. Porché republished with other poems his "L'Arrêt sur la Marne" (in the collection *Commandements du Destin*), and Suberville, *Le Soldat Inconnu*, which won for the author the Grand Prix de Poésie. See the anthology of the war poets, Prévost and Dornier, *Le Livre épique*.

For bibliography on the literature of the War, see: Baldensperger, *Avant-guerre dans la Littérature*; Albert Schinz, *French Literature of the Great War* (1919); Jean Vic, *La littérature de la guerre, manuel méthodique* (5 vols. 1918-1923); Thierry Sandre, *Anthologie des écrivains morts à la guerre* (1924).

**Post-war Period.** Just as the war literature did not stop on Nov. 11, 1918, so did the post-war literature not begin at this date exactly; as early as 1917 there is a distinct tendency on the part of some writers to ignore the monstrous accident of the War.

Bearing on the question of language in post-war Europe, consult Meillet, *Langues de l'Europe nouvelle* (1918).

**Poetry.** Some volumes from 1917 to the end of 1923 which cannot be passed without mention, if it were only on account of the fame of the authors, are Rostand, *Cantique de l'Aigle* including war poems, and Verhaeren, *Chants en forme de dialogues* (both posthumous); Rosemonde Gérard (Madame Rostand), *Pipeaux* (crowned by the French Academy); H. de Régnier, *Vestigia Flammæ* and *Flamma Tenax*; Comtesse de Noailles, *Forces Éternelles* and *L'honneur de souffrir*; Claudel, *Messe de Lù-Bas* and *Feuilles de Saints*; Fr. Jammes, *La Vierge et*

*les Sonnets*; Paul Fort, *Ballades Françaises* (continuation); Jules Romains, *Europe, Puissances de Paris*, and *Chants de dix années*. Two poets had a remarkable revival: Philéas Lebesgue (with his *Chansons de Margot*), and especially Paul Valéry, who is almost a god of poetry now; he was received in the French Academy in 1927; he was a bone of contention in the controversy over "Poésie pure" which started in 1925 (see *New International Year Book*). Among the best known of the poets of the new generations are L. Mercier and Suberville. To get an idea of the extra-modern poetry, see Paul Morand, *Lampes à Arc*; and the cubists and dadaists, Blaise Cendrars, *Du Monde entier*; A. Salmon, *Prikaz*, and Cocteau, *Poésies*. (Cf. Schinz, "Dadaïsme," in *Smith College Studies*, October, 1923). Consult H. Clouard, *Poésie française moderne des Romantiques à nos jours* (1923); de la Vaisière, *Anthologie des poètes du siècle* (1924); Tresch, *Evolution de la chanson française* (1924), and especially E. Bouvier, *Initiation à la littérature d'aujourd'hui*.

**Drama.** In the theatre, we witness early an attempt to go back to pre-war subjects: Claudel is continuing the series of *L'Annonce faite à Marie*, and *L'Otage*, by *Le Pain dur*; Bataille gives *Sœur d'Amour*. In 1920 Curel, *L'Âme en Folie*; Bernstein, *L'Animateur*; Saint George Bouhélier, *Esclaves*; DuBois, *L'Hérodiade*; Brieux, *L'Avocat*, *L'Enfant*; Curel, *Comédie du génie*; Bataille, *Chair Humaine*; Bernstein, *Judith*. In 1921, we have no less than three versions of *Don Juan*: Rostand (posthumous), Bataille, and H. de Régnier; and in 1925 no less than three versions of Joan of Arc, especially Porché, *La vierge au grand cœur*. Then, there are those who belong to what may be called an intermediate generation, like P. Fort, *Louis XI*, *Homme Curieux*, Ghéon, *Pauvre sous l'Escalier*, Géraudy, *Aimer*. The younger group claims attention aggressively: Magre, *La mort enchaînée*; Lenormand, *Les ratés*, *Mangeurs de Rêves*, *Le Simoun*; Natanson, *Enfant Truqué*, *Amants Saugrenus*; Pierre Frondaie, *L'Appassionata*, *L'Insoumise*, *Le Reflet*; J. J. Bernard, *Feu qui Prend Mal*; Sarmant, *Mariage de Hamlet*, *Pêcheurs d'Ombres*; Cromelynck, *Cocu Magnifique*; Cocteau, *Mariés sur la Tour Eiffel*; Régis et Veynes, *Bastos le Hardy*. Among the comedies that scored decidedly, there are Jules Romains' *Knock* (1924), Vautel's *Mon curé chez les riches*, from the author's novel (1925), and Bourdet's *Vient de paraître* (1927). The most famous theatres endeavoring, with changing fortunes, to favor young authors were: L'Œuvre, Le Vieux Colombier, L'Atelier, La Chimère, La Flamme, with such directors as Lugne Poé, Copeau, Dullin, Pitoëff, and Baty. Cf. Delpit, *Paris—Théâtre contemporain* (1924-25). Several plays stirred up considerable discussion in recent years: Raynal's *Tombeau sous l'Arc de Triomphe* (1924); Obey et Amiels's *La Carcasse* (1926); Bourdet's *La prisonnière* (1926), and Maurice Rostand's *Napoléon IV* (1928). See *New International Year Book*.

**The Novel.** Reaching the chapter of the novel since the War, we face such a deluge of works of interest that nothing can be done within the space allotted except to group the various tendencies, give the names of the most important writers in each group, and refer for all details to the *New International Year Book*, 1914-28 (and, until 1923, to "Le Roman Français depuis

la Guerre" by Albert Schinz, in *Modern Language Journal*, May, 1923).

Authors representing the great classical literary style and aiming to create works of lasting beauty: Ch. Géraux, Estaunié, A. de Chateaubriant (Grand Prix du Roman in 1923, for *La Brière*). Catholics: Bourget, H. Bordeaux, Ardel, Baumann, and Mauriac (Grand Prix du Roman, 1926). Novelists dealing with the world beyond: Marcelle Tinayre (*Priscille Séverac*), H. Bordeaux (*Fantôme de la Rue Michel-Ange*), and Pérochon (*Les Ombres*). Provincial and regional novelists: Bazin, Pérochon (*Nèze*, Prix Goncourt, 1920), J. de Pesquidoux, Bordeu, H. Pourrat, R. Escholier (*Cante-gril*), J. des Gachons, Mme. Jean Balde (*Vigne et Maison*), Bouzinac-Cambon, *Domaine abandonné*, and the most famous of them all, L. Hémon, author of the Canadian novel, *Maria Chapdelaine*. Psychologists: André Gide, J. Romains, Marcel Proust (Prix Goncourt, 1919), who still has a tremendous following (he died in 1922); Chardonne, *L'Épithalame*; and Martin Du Gard, *Les Thibault*, etc. Novelists of deep gloom and sentimentality: Arnoux, Jaloux, Chéreau, Josepivici, t'Serstevens; and three women, André Corthis (Grand Prix du Roman, 1921, for *Pour Moi Seule*), Machard, and Vioux. Pictures of moral disequilibrium in consequence chiefly of the War: Marcel Prévost (*Don Juanes*), Rosny, Marguerite, and Mme. Colette. Novelists depicting the life of characters outside regular society: Carco (Grand Prix du Roman, in 1922, for *L'Homme traqué*), Mac Orlan, Cl. Anet, and Kessel. The "Indifférents," to use the name chosen by one of them, i.e., who take the attitude of interested and amused, sometimes cynical, observers of our present nerve-racked world: H. de Régulier, Fr. de Miomandre, Giraudoux, and Paul Morand. Young Cocteau belongs either here, or to a group of extreme modernists, some of whom had adopted the flag of Dadaism, like Aragon, Ph. Soupault, Delteil. Humorists would be Tristan Bernard, Duvernois, H. Béraud (Prix Goncourt for *Le Martyre de l'Odyssée*, 1922), and Billotey. The great king of the *roman d'aventure* is Pierre Benoît (author of *L'Atlantide*); of Exotism: Loti, Farrère, Rhais, and later Barrès (*Jardin sur l'Oronte*); and Bordeaux (*Yamilé sous les Cèdres*). A very special place belongs to the Brothers Tharaud with their remarkable knowledge of the Near East. Historical novels: Louis Bertrand, Tancrède Martel; H. Béraud (*Vitriole de Lune*, crowned by the Goncourt in 1922). Pre-historical novels: Rosny, Forbin, Jean d'Esme, etc. A number of serial novels extending over years of publication have appeared, or begun to appear, since Romain Rolland's *Jean Christophe*; the best known are Marcel Proust, *À la recherche du temps perdu*; Roger Martin Du Gard, *Les Thibault*; Romain Rolland, *L'Âme enchantée*; René Behaine, *Histoire d'une société*; Jules Romains, *Le dieu des corps*.

If we were to mention the novels which in the last fifteen years have shown signs of possible protracted life, we would name, in alphabetic order Barrès, *Jardin sur l'Oronte*; Benoît, *L'Atlantide*; Béraud, *Bois du Templeur pendu*; Bernanos, *Sous le soleil de Satan*; Francis Carco, *L'Homme traqué*; Chateaubriant, *La Brière*; Duhamel, *Vie des Martyrs*; Estaunié, *Au bord de la route*; L. Hémon, *Maria Chapdelaine*; Em. Henriot, *Arctio Brun*; Kessel, *L'équipage*; Leblond, *Ulysse Cofre*; Mauriac, *Gonitria, Désert de l'amour*; Montherlant, *Les Bestiaires*; Mor-

and, *Ouvert la nuit*; Proust, *À l'ombre des jeunes filles*. . . ; Tharaud, *À l'ombre de la Croix*. . . Much has been made lately of Giraudoux's or Miomandre's books, also of J. Green, *Monte Cinère*, and Panait Istrati, *Mikhail*.

Other Literary Genres. One of the most important during the period under consideration was that of personal recollections by writers of fame, which at times are merely poetical evocations of the past, like A. France's *Petit Pierre*, Loti's *Prime Jeunesse*, A. Maurois's *Bernard Quesnay*, L. Bertrand's *J. Perbal*, H. Béraud's *Gerbe d'or*, R. Dorgèlès's *Mon mari mon pays*, Ph. Soupault's *Histoire d'un blanc*, Jammes, A. Gide, Willy, etc; or many diaries of young authors who wrote about their years of formation so as to present a picture of their whole generation. The following claimed attention: Oudart, *Ma jeunesse*; L. Werth, *Dix-neuf Ans*; Cazin, *Décadé*; A. Obey, *Enfance inquiète*; Chardonne, *Inquiète Adolescence*; Benj. Crémieux, *Premier de la Classe*; Gilbert des Voisins, *L'Enfant prit Peur*; and the pitiful *Diable au corps*,—written by Radiguet when he was 17 (it is said. He died in 1924). Accounts of travel have been raised to the level of art in Chardonne's *Pot au Noir*; by the Brothers Tharaud with their remarkable descriptions of the Near-Eastern nations of Europe; also by A. Bonnard's and Gilbert des Voisins's books on China, Morand's *Rien que la terre*, H. Béraud's *Ce que j'ai vu à Berlin*, and Béraud's, Duhamel's, and L. Durtain's books on Soviet Russia. A Chevrillon's, *Enchantement Breton* is another fine sample of geographical literature. The (so far five) series of the famous barrister M. Henri-Robert, *Les Grands Procès de l'Histoire*, have been much read.

By far the most successful genre in recent years has been the literary biography, i.e., opposing to the absolutely objective biography the interpretative biography. A Maurois's *Arctio*, *Vie de Shelley*, soon followed by Pourtales's *Liszt*, started the movement. Now there are a number of collections of "lives", all written by very well-known authors, and of which four are particularly successful: *Roman des Grandes existences* (Balzac, Rimbaud, Villon, Baudelaire, Vingy, Montaigne, etc.); *Nobles vies, Grandes œuvres* (Gyguemer, Racine, Demosthène [by Clémenceau], La Pérouse, Madame Roland, etc.); *Vie des hommes illustres* (Goethe, Stendhal, Montaigne, Disraeli, Alcibiades, Bismarck, Ilugo, Mistral, etc.); *Leurs amours* (La vie amoureuse de Talma, Louis XIV, Musset, Beethoven, La Fontaine, Cléopâtre, Messaline, Hélène de Troie, Madame de Pompadour, Grande Catherine, etc.).

History of Literature and Literary Events. Bédier and Hazard, *Histoire de la Littérature Française illustrée* (1924) in two large volumes has proved very popular, being both less bulky and more up to date than the Petit de Julleville (8 vol.) of 1900. Simultaneously an illustrated edition of Lanson's well-known *History of French Literature* was published. Most worthy of mention are also volumes xii and xiii (they are called "*Histoire des Lettres*") of Hanotaux's *Histoire de la Nation Française*, in 15 vols. Vol. xii, "*Des Origines à Ronsard*," is by Picavet, Jeanroy, and Bédier; vol. xiii, "*De Ronsard à nos Jours*," is by F. Strowski. In America, Nitze and Dargan, of the University of Chicago, published an English *History of French Literature* (1922 2d ed., 1927). For the Middle Ages specially; Ch. V. Langlois, *La vie en*

*France au Moyen-Age*, as reflected in literature, 4 vols. For modern times, there was Le Goffic, *La Littérature Française au XIX<sup>e</sup> et au XX<sup>e</sup> Siècles*. A very valuable publication concerning contemporary writers was *Vingt-Cinq Ans de Littérature Française, de 1895 à 1920*, under the direction of E. Monfort. Not quite satisfactory on account of the author's frequent partiality, is Lalou's little book on *Histoire de la Littérature Française Contemporaine, de 1870 à nos jours*; (new ed., 1928). Mostly an accumulation of names and titles is found in F. Parmentier, *Littérature Française de 1885 à nos jours*; in America, *French Literature of the Last Half-century*, by Cunliffe and de Bacourt. Other efforts to illuminate the public on contemporary literature are those of M. Braunschvig, *La Littérature Française contemporaine* (1925), of A. Billy and of D. Mornet (1927), of E. Bouvier (1928), and E. Sée, *Théâtre contemporain* (1928). A work on a great scale which led the author to the Academy even before its completion is Abbé H. Brémont's *Histoire du Sentiment Religieux dans la Littérature depuis le XVII<sup>e</sup> Siècle* (8 vols. have appeared to date). Other important works include the following authors and titles: Thieme, of the University of Michigan, *Essai sur l'Histoire du Vers Français*; P. Champion, *François Villon, sa vie, son temps* (1914); A. Garnier, *Agrippa d'Aubigné et le parti protestant* (3 vols., 1928); Nollac, *Ronsard et l'Humanisme*; Ducros, *Rousseau* (3 vols.); M. Souriau, *Histoire du Romantisme en France* (3 vols., 1928,—crowned by the French Academy); Vincent, *Georges Sand* (4 vols.); Baldensperger, *Mouvement des idées pendant l'émigration*; B. Faÿ, *Esprit révolutionnaire en France et en Amérique à la fin du 18<sup>e</sup> siècle*; Arbelet, *Stendhal* (2 vols. in connection with the new edition of Stendhal's works); J. Larat, *Tradition et Exotisme dans l'Œuvre de Nodier*; H. Girard, *Émile Deschamps* (2 vols.); Sainte-Beuve, *Mes poisons* (posthumous); Ibrovac, *José-Maria de Hérédia*. New valuable editions which render the study of great French authors more and more profitable are: Villon, Ronsard, Montaigne, Pascal, Rousseau (Mornet's *Nouvelle Héloïse*), Stendhal, Lamartine (Lanson's *Méditations*), Hugo (ed. nationale published by Ollendorff's), and Bérét's *Légende des Siècles*, and Vianey's *Contemplations*. The *Correspondance générale de J. J. Rousseau* comes out since 1924 at the rate of 3 vols. a year, edited by Dufour-Plan. As to language, Brunot's *Histoire de la Langue française des Origines à 1900* has reached its ninth volume ("Révolution et Empire"); also we may note here Bonaffé's *Anglicismes et Américanismes dans la Langue Française*, and Mumford Jones, *America and French Culture*.

A time has never been in France without literary quarrels of some sort. The Goncourt controversy is ever going on: whether or not to publish the *Goncourt Journal* containing material offensive to living people or their relatives. During the World War (1917), there was the Barbusse episode, many maintaining that the book had been dishonestly used for pacifist propaganda; in 1919 Pierre Louys startled the world in ascribing to Corneille some of the best of Molière's plays; in 1920 the accusation was brought against P. Benoit that he had plagiarized Sir Rider Haggard's *She*, for his *L'Atlantide*; the same year the episode of Dadaism came to a climax in the ar-

tistic and literary world; in 1922 it was the shock of Margueritte's *Garçonne*; in 1922-23, the "querelle des manuels littéraires" (well summarized in *Chronique des Lettres Françaises*, January, 1923); in 1924 it was the attack on representatives of the Government who were supposed to use influence abroad in favor of certain publishing firms (see H. Béraud, *Croisade des longues figures*); and the vile attacks on Anatole France's memory; in 1925 it was the *Querelle de la Poésie pure* (see *New International Year Book*, 1925-26); in 1920-27, it was the great battle around the *Action Française* and royalist writers; in 1928 it was the accusation that André Maurois was a plagiarist on a great scale; and the Lauth-Boulenger affair regarding the latter's attack on George Sand's memory. (See also paragraph *Drama*, above).

Among the innumerable literary prizes, some are of real importance. Let us recall a very few: Grand Prix de Littérature went to no one (1914), E. Nolly (*Capitaine d'Étanger*, 1915), P.-M. Masson (1916), Fr. Jammes (1917), Mme. Gérard d'Houville (1918), the Brothers Tharaud (1919), E. Jaloux (1920), Mme. de Noailles (1921), P. Lasserre (1922), F. Porché (1923), Abel Bonnard (1924), General Mangin (1925), Courteline (1926), J. Pesquidoux (1927), and L. Vaudoyer (1928). The Grand Prix du Roman went to P. Acker (1915), Avesnes (*Comte de Blois*, 1916), Ch. Geniaux (1917), Camille Mayran (1918), P. Benoit (1919), André Cortis (1920), Villetard (1921), F. Carco (1922), A. de Chateaubriant (1923), E. Henriot (1924), Fr. Duhourcau (1925), Fr. Mauriac (1926), J. Kessel (1927), and Jean Balde (1928). The Prix Goncourt went to Benjamin (1915), A. Bertrand and Barbusse (1914—retroactively—and 1916), Malherbe (1917), Duhamel (1918), Proust (1919), Péronchon (1920), R. Maran (1921), Béraud (1922), L. Fabre (1923), Th. Sandre (1924), M. Genevoix (1925), H. Deberly (1926), M. Bedel (1927), and M. Constantin-Weyer (1928). The Prix de la Vie Heureuse, or Prix Femina, went to Y—(René Milan, 1917), H. Bachelin (1918), Dorgeles (1919), E. Goyon, a poet (1920), Escholier (1921), Lacretelle (1922), Jeanne Galzy (1923), Ch. Derennes (1924), J. Delteil (1925), Silvestre (1926), Marie Le Franc (1927), and Mme. Dunois (1928).

Many jubilees were celebrated: with special splendor, those of La Fontaine (1921) Molière, Pasteur—not only a man of science but also a member of the French Academy—(1922), Renan, Pascal, Ronsard (1924), since 1927—to last until 1930—Romanticism, and H. Taine (1928). Many deaths are to be recorded: in 1914, Lemaître, Masson-Forestier, Mistral, L. Séché, Ch. Péguy; 1915, Hervieu, R. de Gourmont, Stuart Merrill, J. H. Fabre (the entomologist); 1916, Faguet, de Ségur, de Vogüé, Verhaeren; 1917, A. Bertrand; 1918, G. Ohnet, Rostand, Péladan, Guill. Apollinaire; 1919, Tailhade, Ch. Morice; 1920, P. Adam, Lintilhac; 1921, Montesquiou; 1922, Bataille, Boutroux, Capus, La-visse; 1923, Aicard, Loti, Barrès; 1924, Anatole France, Comte d'Haussoville, H. Cécad; 1925, Pierre Louys, E. Bourges; 1926, Jean Richepin, Boylesve, Le Braz; 1927, R. de Flers; and 1928, François de Curel.

In 1928 the heirs of Victor Hugo bequeathed to the city of Paris, to be turned into a museum, Hauteville House, on the island of Guernsey, where the poet lived in exile from

1853 to 1870, where he wrote, among other works, *Les Misérables* and *La légende des siècles*.

**FRENCH SOMALI COAST.** See **SOMALI-LAND**.

**FRENCH WEST AFRICA.** A single administrative unit of the French colonial possessions since Jan. 1, 1921, comprising the following colonies: Senegal, area 74,112 square miles, population in 1926, 1,318,287 (4650 non-African); Guinea, 89,436 square miles, population, 2,095,988 (2262 non-African); Ivory Coast, 121,590 square miles, population, 1,724,545 (1614 non-African); Dahomey, 41,302 square miles, population 979,609 (884 non-African); French Sudan, 360,331 square miles, population, 2,634,982 (1819 non-African); Upper Volta, 142,820 square miles, population, 3,240,147 (425 non-African); Mauretania, 154,400 square miles, population, 289,184 (279 non-African); Niger Territory, 463,200 square miles, population, 1,218,717 (260 non-African). Total, 1,247,191 square miles, with a population of 13,541,611, of whom 11,099 were French and 4300 other non-Africans. Dakar, the seat of the administration and the leading port, had 32,440 inhabitants in 1921, of whom 2331 were French. Other towns were: Saint Louis, 18,117 (620 French); Rufisque, 11,307 (168 French); Bamako, 14,496; Kayes, 11,322; Conakry, 8850. Forest and agricultural products are of greatest economic importance. In Senegal, the Sudan, and Guinea, the groundnut is of leading importance. Cotton culture, worked by natives, figures largely in Senegal, the Sudan, Dahomey, and the Ivory Coast. Other important activities, as reflected in the foreign trade, are palm kernels, palm oil, logs, gum arabic, hides and skins, and caoutchouc. Agricultural experiments indicated that the following were possible of development: cacao and coffee in Dahomey and the Ivory Coast, tobacco, vegetables, etc. Gold and salt were worked in paying quantities. Exports for the whole government in 1927 were 1,230,700,189 francs, as compared with 118,567,000 francs in 1912. Imports for the years 1912, and 1927, were 134,782,000 francs, and 1,407,620,740 francs. In 1927, 20,229 vessels of 16,466,259 tons entered and cleared ports of French West Africa. Communications are facilitated by the navigability of the Senegal and the Niger rivers. In 1927, 1950 miles of railway were in operation. The principal systems included: Dakar-Saint Louis (263 kilometers), Thiès-Kayes (144 kilometers), Kayes-Niger (155 kilometers), Guinea railways (662 kilometers), Ivory Coast railways (316 kilometers), Dahomey railways (375 kilometers). Miles of telegraph lines in 1927 were 14,386. The general budget for the whole administration was, for 1929, 245,044,000 francs, as compared with 56,250,000 francs in 1911. In 1929 the local budget for the separate colonies totaled: revenues, 400,000,000 francs, expenditures, 375,000,000 francs. At Dakar, the governor general, assisted by a council of native chiefs, administers the affairs of the whole government. Lieutenant governors are in charge of the individual colonies.

**FREUD, Sigmund** (1856- ). An Austrian physician, originator of the psychoanalytic method for the treatment of neuroses (see VOL. IX). The international reputation of Freud increased after the World War. The pathological cases in the armies during the War put Freud's theories to something like an empirical test, and it was recognized by his own disciples

that sex was not the controlling factor. In his writings after 1914, Freud tended to make less use of the principle of sexual symbolism and relied more on the direct intuitions afforded by the psychological situations. The conception of the libido continued to play an important rôle, but without complete identification with concrete sex experience. See **CONSCIOUSNESS AND THE UNCONSCIOUS**; **ÆSTHETICS**; **PSYCHOLOGY**, **ABNORMAL**, AND **PSYCHOANALYSIS**; **PERCEPTION**.

Freud's works after 1914 include *Totem and Taboo* (1915); *Wit and Its Relation to the Unconscious* (1916); *Leonardo da Vinci* (1916); *Delusion and Dream* (1917); *The History of the Psychoanalytic Movement* (1917); *Reflections upon War and Death* (1918); *Massenpsychologie und Ichanalyse* (1921; English translation, *Group Psychology and the Analysis of the Ego*, 1922); *General Introduction to Psychoanalysis* (1921); *Hemmung, Symptom und Angst* (1926); *Zur Frage der Laienanalyse* (1926), and *Die Zukunft eines Illusion* (1928). His works were translated into English, French, and other languages.

**FREY, Emil** (1838-1922). A Swiss statesman (see VOL. IX), who died near Basel, Switzerland. He was one of the technical experts attached to the Swiss delegation at the Genoa Conference.

**FRIDAY, David** (1876- ). An American economist and educator, born at Coloma, Mich. He graduated from the University of Michigan in 1908, and was a member of the faculty of that university from 1908 to 1916, when he was appointed professor of economics at New York University. In 1918 he was head of the department. He was professor of political economy at the University of Michigan, 1919-21; president of the Michigan Agricultural College, 1921-23; professor of political economy in the New School for Social Research, New York City, after 1923. He served as statistician and expert to many important commissions, and was also adviser to several governmental departments and boards. He wrote *Problems in Accounting*, 1915; *Readings in Economics*, 1915; *Profits, Wages, and Prices*, 1920.

**FRIEDBERG, Carl** (1872- ). A noted German pianist, born at Bingen. He received his musical education at the Hoch Conservatory in Frankfurt under Knorr, Kwast, and Clara Schumann, and later attended the University of Heidelberg. He made his début in Vienna in 1892. During 1893-1904 he taught at the Hoch Conservatory, and from then until 1914 at the Cologne Conservatory. At the outbreak of the World War, he came to the United States, where he immediately established himself in popular favor. In 1916 he was appointed professor at the Institute of Musical Art in New York. Since 1918 he has divided his time between Munich and New York, teaching and in concert tours. He is unsurpassed for his poetic interpretations of the romantic composers, especially Schumann, and equally remarkable as an ensemble player. With Carl Flesch and Hugo Becker, he formed a trio which has become internationally famous.

**FRIEDMAN, Ignaz** (1882- ). A famous Polish pianist and composer, born at Podgorze, near Cracow. After completing his academic education in his native city, he studied composition in 1900 under Riemann in Leipzig, and then went to Vienna to develop his remarkable pianistic talent under Leschetizky, making his début

there in 1904. Since then, he has met with great success in all the civilized countries of the globe, and is especially famous as an interpreter of Chopin. He first visited the United States in 1920, and at once established himself in the favor of the public. His compositions, entirely free from any modernistic influences, possess sterling merit. He has written a piano concerto, a piano quintet, songs and numerous pieces for piano solo. He is the editor of the great Chopin edition published by Breitkopf & Härtel, as well as of the Schumann and Liszt editions published by the Universal Edition.

**FRIENDS, RELIGIOUS SOCIETY OF.** The Friends, commonly known as Quakers, are composed of four branches: The Society of Friends (Orthodox), Society of Friends (Hicksite), Orthodox Conservative Friends (Wilburite) and Friends (Primitive). The Orthodox branch, which is by far the largest, decreased from 92,379 in 1916 to approximately 81,000 in 1928. This group organized, in 1902, the Five Years' Meeting which maintained, by 1929, seven colleges. *The American Friend*, a weekly, is the periodical of the denomination. The Hicksites, or Liberals, who separated in 1827, following Elias Hicks, had 17,170 members in 1916, and 16,560 in 1928. They publish *Friends' Intelligencer*, and a children's monthly, *The Scattered Seeds*. The membership of the Wilburites decreased from 3373 in 1916 to 2966 in 1926, and the Primitive Friends had two churches with 60 members in 1916, and one church with 25 members in 1926. In recent years, the various branches of the Friends in America have worked together, and cooperated with the Friends in England, maintaining several joint organizations. The Hicksite and Orthodox members held their first service together in over a hundred years at New York, in May, 1928. A conference of all branches of the Religious Society of Friends was held at Oskaloosa, Iowa, in 1929.

**FRIES, AMOS ALFRED** (1873- ). An American soldier and engineer, born in Vernon County, Wis. Appointed in 1894 to the U. S. Military Academy, he was graduated seventh in his class. His first army service was in the Philippines under Pershing against the Moros. He was made 1st lieutenant (1901), captain (1904), major (1912), colonel (1917), brigadier general (1918), and major general (1925). In 1911-14 he was director of military engineering at the Engineers' School, Washington Barracks, and edited *Professional Memoirs*, the official publication of the Corps of Engineers. For several years, he was in charge of the building of roads, fortifications, jetties, breakwaters, and dredging of the Colorado River, but his most conspicuous service in this period was in completing the improvement of Los Angeles Harbor in San Pedro Bay. Going to Europe in 1917, he was made chief of the Gas Service—a unit that developed under his direction into the Chemical Warfare Service, which at the Armistice had 600 officers and 3000 men. He was awarded the Cross of the Legion of Honor (1918), the Cross of the Companions of St. Michael and St. George (1919), and the D. S. M. (1920). After the World War, he was in command of Edgewood Arsenal in Maryland, and from 1920 he was Chief of the Chemical War Service. He was retired on his own application in 1929.

**FRIES, ARCHIBALD** (1864- ). An American railway official, born in Cincinnati, Ohio. He was educated in the public schools of that

city and began his railroad employ in a clerical capacity with the Ohio & Mississippi Railroad. For several years he was employed in various important capacities by the Baltimore & Ohio Railroad and served as general traffic manager of the Eastern Lines, 1916-18. His jurisdiction was extended over the entire system. During the World War, he served as traffic manager to the Railroad Administration. Since 1920 he has been vice president in charge of traffic and commercial development of the B. & O. system.

**FRIESEKE, FREDERICK CARL** (1874- ). An American painter (see VOL. IX). Among other recognitions received by him during the period, were a grand prize at the Panama-Pacific Exposition, in 1915, also the Palmer Gold Medal, Art Institute of Chicago, in 1920; and a gold medal, Philadelphia Art Club, in 1922. In his later works, among them "The Blue Gown," "Golden Locket," "Lady in Rose," he was still decidedly the impressionist chiefly interested in representing female figures and the nude.

**FRISCHEISEN-KOHLER, FRISH'IZÉN-KÖLÉR, MAX** (1878- ). A German professor of philosophy and pedagogy. His works include *Problems des Ewigen Friedens* (1915), *Grenzen der Experimentalen Methode* (1918), and *Simmel* (1919); he edited Ueberweg's *History of Philosophy* and translated the works of Shaftesbury and Hobbes.

**FRITCH, LOUIS CHARLTON** (1869- ). An American engineer, born in Springfield, Ill. He took an engineering course at the University of Cincinnati and was division engineer of the Baltimore & Ohio Railroad in that city until 1899, when he became superintendent. He acted successively as assistant to the general manager, assistant to the president, and consulting engineer for the Illinois Central Railroad until 1909, when he became chief engineer of the Chicago Great Western Railroad. From 1914 to 1917, he was general manager for the Canadian Northern Railway and was general manager for the S. A. L. Railway, Norfolk, Va., 1917-18, and vice president of the Chicago, Rock Island & Pacific Railway after 1918. He was president also of the Rock Island & Oklahoma Railway Company and several other important corporations.

**FROST, ROBERT** (1875- ). An American poet born in San Francisco and educated at Dartmouth and Harvard. After teaching English in the Pinkerton Academy (Derry, N. H.) and teaching psychology (1911-12) at the New Hampshire Normal School, he went to England and published there his first two volumes of prose. On his return to America, he did some active farming at Derry, N. H., and culled therefrom a knowledge of rural life in New England, as was illustrated in his *North of Boston* (1914), which immediately placed him in the front rank of contemporary American poets. In most cases, his pictures of Yankee shyness prove an intimate understanding and love of his neighbors which could come only through close contact. And in his hands, the folk speech of these people possesses a beautiful and melancholy dignity. In 1916-20, he was professor of English at Amherst College; then was poet in residence at the University of Michigan; and in 1923 returned to the faculty of Amherst. He also has written *A Boy's Will* (1913), *Mountain Interval* (1916), *New Hampshire* (1923), *A New Book of Lyrics*



(1928), *West-Running Brook* (1928), and many poems for the magazines. He won the Pulitzer Prize for poetry in 1924.

**FROTHINGHAM, PAUL REVERE** (1864-1926). An American clergyman, born at Jamaica Plain, Mass., and educated at Harvard University. After preaching for some years at New Bedford, Mass., he became minister of the Arlington Street (Unitarian) Church in Boston in 1900. He was preacher to Harvard University at various periods between 1899 and 1921. He was the author of *William Ellery Channing: His Messages from the Spirit* (1907); *A Confusion of Tongues* (1917); *We Believe* (1917); *Our Debt to Great Britain* (1919); *Edward Everett, Orator and Statesman* (1925).

**FRUIT.** See **HORTICULTURE.**

**FRYATT, CHARLES** (1872-1916). A British sea-captain, born near Harwich, Essex. In 1904 he became chief officer in the service of vessels of the Great Eastern Railway Company. During the first two years of the World War, he captained the *Brussels* between Harwich and Rotterdam. His ship was captured by the Germans and he was executed at Bruges on July 28, 1916.

**FUAD I, fū'ād, (AHMED FUAD PASHA)** (1868- ). King of Egypt, son of the late Khedive Ismail Pasha. He became Sultan on Oct. 9, 1917, and after the termination of the British Protectorate over Egypt in February, 1922, he was proclaimed king (March 16). He made a tour of London and other European capitals in 1927. King Fuad was the eighth ruler of the dynasty of Muhammad Ali, who made himself absolute ruler of Egypt by force of arms in 1805.

**FUCHS, fuchs, EMIL** (1866- ). An American sculptor, painter, and medallist, who was born in Vienna and studied under Tilgner and later in the academies of Vienna and Berlin. He spent five years in Rome, won the gold medal at Munich with the group "Mother Love," in 1890, and then executed a series of important commissions for the British royal family. In 1905 he went to the United States, where he became a naturalized citizen in 1924. He designed medals for the Hudson-Fulton Celebration, and the Hispanic and Numismatic societies, and executed the J. Pierpont Morgan Memorial Medal, and painted a number of portraits of distinguished men and of society women. He wrote *With Pencil, Brush, and Chisel* (1925).

**FUEL.** See **CHEMISTRY, APPLIED; BOILERS; COAL; MOTOR VEHICLES; PETROLEUM.**

**FUEL SHIP.** See **VESSEL NAVAL.**

**FUERTE, LOUIS AGASSIZ** (1874-1927). An American illustrator and mural painter (see Vol. IX). In his specialized field, bird and animal life, he illustrated several series for the *National Geographic Magazine*, 1914-19; Burgess's *Bird Book for Children* (1917), and Burgess's *Animal Book for Children* (1920); and executed paintings for the New York Zoological Society.

**FULDA, fū'l'dā, LUDWIG** (1862- ). A German dramatist and translator (see Vol. IX). His later plays include *Unter Uns* (1912), and *Der Dummkopf* (1928). He added to his translations Shakspeare's *Sonnets* and Ibsen's *Peer Gynt*, and edited *Arabian Nights*, a collection of Spanish comedies, and an anthology of epigrams.

**FULLERTON, GEORGE STUART** (1859-1925). An American professor of philosophy (see Vol. IX). His Columbia professorship ended in 1917.

His works after 1914 include *Germany of To-day*, a defense (1915), and a *Handbook of Ethical Theory* (1922).

**FUNCTIONALISM.** See **BEHAVIORISM.**

**FUNDAMENTALISM.** See **RELIGIOUS CONTROVERSIES.**

**FUNK, CASIMIR** (1884- ). A Polish biochemist, born in Warsaw, who is credited with the discovery of the vitamins. He received the degree of Ph.D. from the University of Berne in 1904 and during the next two years did research work in the Pasteur Institute, Paris. From 1906 to 1910, he was an assistant of Abderhalden's at Berlin and later did research work at the Lister Institute, London. Coming to the United States, he was for a time engaged in research work on cancer at Cornell University and later (1917-23) was chief biochemist to the firm of Metz & Co., New York. In 1921 he also became assistant professor of biochemistry at Columbia. When the State School of Hygiene was established at Warsaw in 1923, he was called to the chair of biochemistry. From 1910 to 1919, Funk wrote 28 papers on the vitamins, alone or in collaboration. His monograph *Die Vitamine* was published in German in 1914.

**FURMAN, FRANKLIN DERONDE** (1870- ). An American engineer and educator, born in Ridgely, Md. He graduated from the Stevens Institute of Technology in 1893, and from the same year was successively instructor, assistant professor, and professor of mechanism and machine design at that institution. He was a member of several engineering societies and wrote *History of the Stevens Family of Engineers; History of Stevens Institute of Technology; Questions and Problems in Machine Design; Questions in Engineering Drawing, Cam, Elementary and Advanced* (1921); *Planetary Gearing* (1924). He also contributed articles to magazines.

**FURNESS, CAROLINE ELLEN** (1869- ). An American astronomer and educator, born in Cleveland, Ohio. She graduated from Vassar College in 1891 and took post-graduate courses at Columbia. She became a member of the faculty of Vassar College and after 1915 was Maria Mitchell professor. She performed research work at the Yerkes Observatory and in Europe. She was the author of several star catalogues and *Introduction to the Study of Variable Stars* (1915). She also contributed articles to American and European journals.

**FURNISS, HARRY** (1854-1925). A British caricaturist, artist, author, and lecturer (see Vol. IX). Among his later works were *Our Lady Cinema* (1914); *More about How to Draw in Pen and Ink* (1915); *Deceit, a reply to "De-feat"* (1917); *Stiggins* (1920); *Some Victorian Women (Good, Bad, and Indifferent)* (1923); and *Some Victorian Men* (1924). He also gave many humorous lectures throughout England, and wrote numerous scenarios.

**FURTWÄNGLER, WILHELM** (1886- ). A noted German orchestral conductor, born in Berlin. Having completed his studies in Munich under Beer-Walbrunn, Rheinberger, and Schillings, he began his career in Zurich. From 1911 to 1914, he was principal conductor at the Opera in Lübeck, directing also the concerts of the Verein der Musikfreunde. In 1915 he succeeded Bodanzky in Mannheim, where he remained four years and established a reputation which brought him invitations for guest-appearances with the foremost German and Austrian

orchestras. He was regular conductor of the Vienna Tonkünstlerorchester (1919-20) and of the symphony concerts of the Berlin Staatsoper (1920-22), succeeding Richard Strauss. In 1922 he was chosen Nikisch's successor as conductor of the famous Gewandhaus concerts in Leipzig and of the Philharmonische Gesellschaft in Berlin. In 1923 he aroused great enthusiasm in London, so that for the season of 1924-25 he was engaged by the Royal Philharmonic Society and the London Symphony Orchestra to conduct several of their concerts. On Jan. 3, 1925, he made his American début with the New York Philharmonic Society with overwhelming success, leading to his engagement as regular conductor for the spring seasons of 1926 and 1927.

**FUTURISM.** See MUSIC; PAINTING; and SCULPTURE.

**FYFE, H. HAMILTON** (1869- ). An English author and journalist, born in London and

educated at Fettes College in Edinburgh. His career in journalism started as a reporter on the *Times* in 1889, and after 13 years of holding positions as sub-editor, reviewer, dramatic critic, etc., he edited the *Morning Advertiser* (1902-03), and *The Daily Mirror* (1903-07), subsequently becoming dramatic critic for the *World* (1905-10), and special correspondent of the *Daily Mail* (1907-18). He was a war correspondent (1914-18), honorary attaché in the British War Mission to the United States (1917), lectured throughout Great Britain (1918-22), and edited the *Daily Herald* (1922-26). He published many books and plays, which include *A. W. Pinero* (1902); *A Modern Aspasia* (play, 1909); *The Real Mexico* (1914); *Petrograd* (1916); *The Meaning of the World Revolution* (1919); *The Widow's Cruse* (1920); *The Making of an Optimist* (1921); *Behind the Scenes of the Great Strike* (1926); *The Religion of an Optimist* (1927), and *The British Liberal Party* (1928).

**GABRIŁOWITSCH, OSSIP (SALOMONOVITSCH (1878– )**. A Russian pianist (see VOL. IX). Besides being recognized as one of the greatest pianists of his day, he won fame as an orchestral conductor. From 1910 to 1914, he was conductor of the Konzertverein in Munich, but he did not abandon his career as a pianist. During 1912–13 he won veritable triumphs in several European capitals with his series of six historical concerts illustrating the development of the piano concerto from Bach to Rachmaninov. After the outbreak of the World War, he went to the United States giving the same cycle and arousing the same enthusiasm. In 1918 he became conductor of the Detroit Symphony Orchestra. He has also appeared frequently as guest-conductor with several of the great symphony orchestras.

**GAILOR, THOMAS FRANK (1856– )**. An American Protestant Episcopal bishop (see VOL. IX). He became chairman of the House of Bishops of the Protestant Episcopal Church in 1916, Presiding Bishop, 1919–26, and president of the National Council, 1922–25. He has received honorary degrees from Oxford (1920) and Oglethorpe University (1921).

**GÄL, HANS (1890– )**. An Austrian composer, born at Brunn. He studied in Vienna under Mandyczewski and Adler, and in 1918 became lecturer on musical theory at the university. In 1915 he won the Austrian State Prize with his first symphony. His works include the operas, *Der Arzt der Sobeide* (Breslau, 1919), *Die heilige Ente* (Düsseldorf, 1923), and *Das Lied der Nacht* (Breslau, 1926); the choral works with orchestra, *Von ewiger Freude*, *Vom Bäumlein das andere Blätter hat gewollt*, *Phantasien*, *Requiem für Mignon*; incidental music to Levetzow's *Ruth*; choruses a cappella and much chamber music. He also is the author of *Anleitung zum Partiturlernen* (1923).

**GALE, ZONA (MRS. WILLIAM BREESE) (1874– )**. An American writer (see VOL. IX). She wrote *Neighborhood Stories* (1914); *Heart's Kindred* (1915); *A Daughter of To-Morrow* (1917); *Birth* (1918); *Peace in Friendship Village* (1919); *The Secret Way* (verse, 1921); *The Neighbors*, a one-act play; *Miss Lulu Bett*, the dramatic version of which received the Pulitzer Prize of \$1000 as the best play of the year produced in New York (1920); *Faint Perfume* (1923); *Preface to a Life* (1926); *Yellow Gentians and Blue* (1927); *Portage, Wisconsin* (1928); *Borgia* (1929). *Mister Pitt*, a dramatized version of *Birth*, was produced in New York in 1924. In 1928 Miss Gale was married to William Breese.

**GALICIA, gá-lish'ya, EAST**. In the determination of the southeastern boundary of Poland, and in particular the disposition of the former Austrian province of Galicia, the Peace Conference following the World War was confronted by one of its most vexing problems. In fact

it was not until March, 1923, that the matter could be considered as settled, and then only after a fashion. The question of West Galicia roused little controversy; the district was solidly Polish, and the Supreme Council, in assigning it to Poland by the "Certain Frontiers" Treaty of Aug. 10, 1920, was clearly recognizing Polish historical and ethnical rights. But the eastern two-thirds of the province raised other questions. In East Galicia, the majority of the inhabitants were Ruthenians, i.e., Ukrainians; the 1910 census showed a population made up of 59 per cent of Ruthenians, 27 per cent Poles, and 13 per cent Jews. Besides the question of race, religious and cultural antipathies existed. The Poles are Roman Catholic; the Ruthenians, Greek Orthodox Uniate. Ruthenian interest centred in the question of race, while the Poles, in addition to their cultural and commercial dominance, sought East Galicia for military and economic reasons.

The Peace Conference had tried valiantly to cope with the problem. Undoubtedly, as the British contended, the Ruthenians were entitled to some sort of self-determination, and it was manifestly unfair to cede the territory to Poland outright. No group, however, seemed willingly to consider a transfer of East Galicia east of the Lemberg-Drohobycz line to Russia. But the Poles presented the delegations with a *fait accompli*, and it was no doubt with relief that on June 19 the Poles were authorized to continue their military occupation of the whole country. Plain justice, nevertheless, demanded a consideration of Ruthenian claims, and to the end of 1919 the Supreme Council concerned itself with plans for the guarantee of Ruthenian autonomy. But the French succeeded in blocking all these attempts. Undoubtedly, the just disposition of the province had presented almost insuperable obstacles; the League of Nations could not handle the task in 1919, for it was not yet functioning, while none of the European powers was in a position to take up the onerous duty of protection and administration in a region where hatreds were so implacable. As things were, 4,500,000 Ruthenians were under the domination of a Polish minority, with no provision for the protection of their liberties or the ascertainment of their wishes. On Mar. 14, 1923, the capstone was placed on the situation when the Council of Ambassadors, in definitely laying down the boundaries of Poland, assigned East Galicia to Poland. See POLAND, under *History*; WORLD WAR.

**GALLAGHER, MICHAEL JAMES (1860– )**. A Roman Catholic bishop, born at Auburn, Mich., and educated at Mungret College, Limerick, Ireland, and at the University of Innsbruck, Austria. He was ordained priest in 1893, and after filling several pastorates and holding various offices, he became bishop of Grand Rapids in 1916. In 1918 he was transferred to Detroit.

**GALLI-CURCI, AMELITA (1889– )**. A brilliant Italian coloratura soprano, born at Milan. Among the world's great singers, pres-

ent or past, her case is without parallel as the only example of an artist achieving distinction without technical training under a teacher. While studying at the Conservatory in Milan, she devoted herself exclusively to the piano, under Appiani, with the ambition of becoming a pianist, and with such success that in 1903 she won the first prize. Later, on discovering that she was gifted with a fine natural voice, she began a unique system of self-instruction. She had records made of her voice, and these she studied carefully, her exceptionally keen ear enabling her to discover and remedy imperfections. However, she acknowledged her indebtedness to Mascagni and William Thorner for advice. In 1909 she made her debut as Gilda in *Rigoletto* at the Teatro Costanzi, in Rome, winning instantaneous success, which secured her appearances at several important Italian opera houses during the same year. The next year she made her first tour of South America, after which she sang again in Italy. In 1912 she was again in South America; in 1914 she made her first tour of Spain, and in 1915 she sang in Havana. Then came her sensational success with the Chicago Opera Association (Nov. 18, 1916), of which she was a regular member until 1924. But all these triumphs were eclipsed by the ovations she received at her first appearance in New York (Jan. 28, 1918), when the Chicago company visited the metropolis for a four weeks' season. These visits were repeated annually till 1922. Beginning with 1923 Galli-Curci appeared every season as guest artist at the Metropolitan Opera House. London did not hear her till the fall of 1924. She was married in 1910 to the painter Luigi Curci, whom she divorced in 1920. In 1921 she married Homer Samuels, her accompanist.

**GALLIENI**, gā'lyā'nē', JOSEPH SIMON (1849-1916). A French general and statesman (see Vol. IX), who was military governor of Paris from Aug. 27, 1914, until October, 1915, when he entered Briand's cabinet as Minister of War. Ill health forced his resignation in March 1916, and he died on May 27 of that year. In 1920 *Mémoires du Général Gallieni; défense de Paris* was published. Consult *Gallieni parle* by Leblond (2 vols., 1920), and *Gallieni, 1849-1916*, by Gheusi (1921). See WORLD WAR, under *Western Front*.

**GALLIOLI**. See WORLD WAR, under *Turkish Front*.

**GALLOWAY**, BEVERLY THOMAS (1863-). An American botanist (see Vol. IX). In 1913-14 he was Assistant Secretary of Agriculture, and in 1914-16, dean of the State College of Agriculture of Cornell University. After the latter date, he was pathologist of the office of seed and plant introduction for the United States Department of Agriculture.

**GALLOWAY**, CHARLES WILLIAM (1868-). An American railway official, born in Baltimore, Md. He began his railway career as a messenger in the telegraph department of the Baltimore & Ohio Railroad in 1883. He served that road in various capacities and became superintendent of transportation in Baltimore in 1906. He served as general manager of the Baltimore & Ohio from 1912 to 1916 and as vice president and general manager of the Baltimore & Ohio Southwestern from 1916 to 1918. He was Federal manager for the Western lines of several railways during the World War, and after 1920 was vice president in charge

of operation and maintenance for the Baltimore & Ohio system.

**GALLSTONE DISEASE**. New methods of diagnosis and treatment of gallstone disease have been introduced by Dr. Lyon of Philadelphia and his disciples, which were incorporated in his large monograph on non-surgical drainage. By means of the duodenal sound, it is possible to obtain bile under all kinds of circumstances and subject it to analysis. The discovery that the bile in gallstone disease may be entirely normal is contrary to the old belief that stones cannot form in the presence of healthy bile. The chologogue action of various substances can be studied by introducing them into the duodenum through the stomach and watching their action on the flow of bile. It becomes evident that the empirically recognized chologogue substances are scientifically justified, for magnesium sulphate, olive oil, sodium phosphate, and a number of other substances appear to possess this property of expelling bile from the gall bladder into the duodenum. It is also possible by means of any one of these substances introduced into the duodenum to cause the escape of stones, or what is better, to prevent their formation by occasional resort to the sound.

The claim that the use of the latter may sometimes precipitate a severe attack of gallstone colic in a patient in whom the stones might never have caused trouble if left alone may be viewed from various angles. Thus, we may entirely disbelieve in this possibility in the absence of complete proofs, or we may look on it as a rare event of little practical importance to the public at large; finally, we may regard the expulsion of a quiescent stone as a good thing.

Following closely upon the introduction of the method of non-surgical drainage or duodenal tubage for the prevention and cure of gallstone disease another revolutionary advance has been made, this time chiefly in the domain of diagnosis and of radiographic diagnosis. While no advance has been made in increasing the visibility of gallstones, a very marked one is to be heralded as increasing the visibility of the gall bladder, both normal and diseased. The chief credit for this innovation goes to Dr. Graham, St. Louis surgeon, and its designation is "cholecystography." The earliest reports go back to 1925 and the full description of the method is found in the literature of 1926. A writer of the period sums up the discovery as follows: "Cholecystography is a new method of investigating the biliary system based on the ability of the liver to excrete certain dyes which are opaque to the X-rays. It is a means of studying the topography of the gall bladder in the living; throws light on its physiology; is of value in deciding the indication for operation; and is of equal value with the opaque meal in disease of the digestive tract and pyelography in urinary diagnosis." The rapid advance in the technique and the universal adoption of the method are quite characteristic of the age.

**GALLWITZ**, gāl'wītz, MAX C. W. VON (1852-). A German artillery general, born at Breslau, and educated at the Gymnasium and military academy. He entered the artillery service in 1870 and was progressively promoted until he became lieutenant colonel in 1896. He was made department chief in the War Ministry the following year and major general in 1902. In 1903 he had the direction of the army in the War Ministry; in 1906 he was made commander

of the 15th Division; and in 1911, general of artillery and inspector of field artillery. During the entire period of the World War, he was artillery corps commander. In 1918 he was made commander-in-chief of several armies. He was raised to the nobility in 1913. From 1920 to 1924, he was a Nationalist member of the Reichstag.

**GALSWORTHY, GÖLZWÜRTH I, JOHN** (1867- ). An English author (see Vol. IX). In June, 1929, he was decorated with the Order of Merit. Among his later works are *The Little Man and Other Satires* (1915); *The Freelanders* (1915); *A Sheaf* (vol. i, 1916; vol. ii, 1919); *Beyond* (1917); *Five Tales* (1918); *Saint's Progress* (1919); *Addresses in America* (1919); *Tatterdemalion* (1920); *Captures* (1923); *Caravan* (a collection of short stories, 1925); *Verses New and Old* (1926); *The Forsyte Saga* (1922); *The White Monkey* (1924); *The Silver Spoon* (1926); *Two Forsyte Interludes* (1928); and *Swan Song* (1928), four novels about *Forsyte Saga* characters, which were combined and published under the title *A Modern Comedy* (1929). Also the plays, *The Mob* (1914); *A Bit o' Love* (1915); *The Skin Game* (1920); *Star Short Plays* (1921); *Loyalties* (1922); *Old English* (1924); *The Show* (1925); *Escape* (1926). In all his later works appear the author's usual intellectual fineness and careful and thoughtful weaving. For additional information consult a biography: *John Galsworthy, A Survey*, by Leon Schalit (1929).

**GAMBIA.** A British colony and protectorate at the mouth of the River Gambia in West Africa. Area of colony proper, 4 square miles, (population 10,000); area of the protectorate 4130 square miles (population in 1921, 200,000). The chief export from Gambia is groundnuts, with a total valued at £907,941 in 1927. This made up 96 per cent of the total shipments. Other exports are palm kernels and hides. Total exports for 1927, £999,887, as compared with £926,127 in 1914. Imports for 1927 were £956,741 as compared with £688,097 in 1914. In 1913, 625,132 tons entered and cleared; in 1927, 1,284,664 tons. Revenues in 1913 were £124,990; 1926, £252,419. Expenditures in 1913 were £95,210; 1926, £277,625. The last figure includes £50,000 set aside for establishment of a Reserve Fund. The natives persisted in devoting themselves exclusively to the groundnut industry to the neglect of food crops. During the World War this caused a real food stringency because of the lack of shipping.

**GANDHI, MOHANDAS KARAMCHAND** (1869- ). An Indian nationalist leader, born at Porbandar, India. He went to London in 1888 to study law. After careful observation of Christianity and Western civilization, he returned to India in 1893, but soon afterward went to South Africa to practice law. Mistreated by the white men in South Africa, he developed a philosophy of passive resistance.

Nevertheless, during the World War, he raised Indian recruits in London and Kheda, except during his retreat in 1916 at Ahmadabad, where he came under the influence of the teachings of Tolstoy. In March, 1919, the Government put into operation the Rowlatt Act, which suspended civil rights and established martial law in any part of India where disturbances took place. In the same year occurred the shooting at Amritsar of 300 Indians by British troops. These events led Gandhi to start the non-

coöperative movement, in which British goods, titles, courts, education, public functions, and political life were boycotted. The Mohammedans, enraged at the division of the Moslem holy places of Turkey between Great Britain, France, and Greece, joined the movement. Gandhi was appointed by the All-India Congress of December, 1921, as sole executive of the non-coöperative forces.

For his part in various disturbances, he was tried in March, 1922, and sentenced to prison for six years. Many feared a gigantic uprising, but Gandhi admonished his followers not to resort to arms. He went to prison cheerfully and no disturbance occurred. During his imprisonment, the Nationalist movement took another direction, and Gandhi's influence declined. In 1926 he announced his temporary retirement from politics. On Mar. 4, 1929, he was arrested after a riot in Calcutta caused by the burning of foreign cloth. From time to time, his theories and speeches were published. Consult *Mahatma Gandhi*, by Romain Rolland (1924), and *Lenin and Gandhi*, by René Filop-Miller (1928). See INDIA, under *History*.

**GANS VON LUDASZY, JULIUS** (1838-1923). An Austrian journalist and author, born in Vienna. He was editor of the *Wiener Neue Freie Presse* from 1902 to 1915. His first publication was a thesis, *Die Wirtschaftliche Energie: System der Oekonomistischen Methodologie* (1893). He later published *Also Sprach Confucius* (1900). Thereafter, he devoted himself to drama and fiction. Among his plays, most of which were produced in Vienna, are *Bessere Leute* (1902), *Der Sonnenstaat* (1904), and *Die Trennende Brücke* (1913); among his stories, *Die Heilige Schlange* (1912), *Die Macht der Schatten* (1914), *Die Grosse Sünde* (1915), *Der Tanzende Stern* (1917), and *Der Turm der Liebe* (1920).

**GANT, SAMUEL GOODWIN** (1869- ). An American surgeon and proctologist, born at Knoxville, Mo., and educated at the Missouri Medical College. He practiced for some years in Kansas City, Mo. In 1899 he removed to New York City to become professor of surgery (proctology) in the Broad Street Hospital Postgraduate School of Medicine. For some years, he conducted private surgical hospitals. He published numerous works covering diseases of the colon, rectum, and intestinal tract: *Diagnosis and Treatment of Diseases of the Rectum* (1896; rev. 1902); *Constipation and Intestinal Obstruction* (1909), reissued in 1916 in revised form as *Constipation, Obstipation, and Intestinal Stasis; Diarrheal, Inflammatory, Obstructive, and Parasitic Diseases of the Gastro-intestinal Tract* (1915); and *Diseases of the Rectum, Anus, and Colon* (3 vols., 1923).

**GANZ, RUDOLF** (1877- ). A Swiss pianist (see Vol. IX). In 1921 he transferred his main activity from the field of piano playing to that of conducting, when he accepted the conductorship of the St. Louis Symphony Orchestra, which he directed until 1927. After his election as vice president of the Chicago Musical College, in 1928, he took up his residence in that city.

#### GARBAGE AND REFUSE DISPOSAL.

The net changes in garbage and refuse disposal since 1914 left the various processes in much the same relation to each other as at the beginning of the period, with a strong trend toward incineration, and a falling off of reduction and



hog feeding (garbage only), although the latter is still extensively practiced. The most extensive statistics on garbage and refuse collection and disposal ever made available in the United States were gathered by the United States Food Administration in 1917. They covered, as far as possible, places of 10,000 population and over. See discussion in *Engineering News-Record*, Oct. 17, 1918.

In the United States, probably in much lesser degree in other countries, garbage and refuse disposal is in many respects the most unsatisfactory of the various municipal services. In Europe, work in this field is on a more permanent and generally satisfactory basis than in the United States. It is not so much the collection service that is bad in America, although that is incomplete in a large percentage of municipalities and often poor, as it is the final means of disposal. The incompleteness of the American service, both as to collection and disposal, is in part due to the variety and extent of the demands on American municipal treasuries, but the poorness of the service performed and the constant shifting from one method of disposal to another and the very frequent abandonment or at best the very poor operation of disposal plants is due most of all to the failure of American cities to regard the garbage and refuse disposal service, and for that matter the collection service as well, as essentially an engineering problem. Shift from one method of disposal to another, utterly inadequate operating service of disposal plants, and the abandonment of plants representing large capital investments are common; together they result in the waste of very large sums of money. So seldom does a city turn to an engineer experienced in garbage collection and disposal for preliminary studies to determine the best method to be adopted, for the preparation of plans and specifications, and for supervision of contracts, that there are very few engineers specializing in garbage disposal, compared with the large number of waterworks and sewerage specialists.

**Methods of Disposal Outlined.** The chief methods of garbage disposal in use in various parts of the world in 1929 were dumping on land or into water; earth burial or covering with ashes instead of with dirt; incineration, with or without attempts at heat utilization; reduction, for the recovery of grease and fertilizer base, or in rare cases, for the conversion of garbage into stock food, which must still be considered as in the experimental stage; and fermentation, the end-product to be used as a fertilizer, a new method introduced in several Italian cities and tried in a small way in the United States. Although no exact figures are available, it is probable that throughout the world more garbage and other municipal refuse are disposed of by dumping on land or in water than by any other method. Water dumping was long the chief method of disposal practiced by New York City; in 1896 it was given up for disposal by reduction, but in 1918, with a political change in administration it was returned to for a considerable part of the city. In Richmond and Queens boroughs, most of the New York garbage is disposed of by incineration. Early in 1924, a 300-ton incinerating plant was put in use in Manhattan Borough; since then, two similar plants have been built in that borough, and in 1928 four more were authorized. In the same year, contracts were

let for three 500-ton incinerators for the Borough of Brooklyn, where two 100-ton plants were already in use. Chicago put in use in 1928 a 600-ton incinerator consisting of six 100-ton units. In the same year, New Orleans contracted for three incinerators, in addition to a couple already in use.

The incinerators thus far mentioned have mixed refuse—garbage and rubbish of various sorts. Refuse salvaging stations, for the recovery of salable paper, rags, and other substances, were in use in 1929 at 15 district stations in the Borough of Brooklyn, at two plants in Baltimore, and at one in Los Angeles, Calif. In addition, Los Angeles operated an incinerator for market waste, while its garbage, as stated further on, was sold to a contractor who feeds it to hogs. The land dumping of garbage and refuse, if little or no attempt is made to take the proper care of the dumps, is likely to give offense from odors, from scattering papers, and from smoldering fires in the dumps, but it is possible so to handle the dumps as to keep them from being a nuisance. Earth burial or the depositing of garbage in relatively shallow layers and covering it with a few inches of earth, may be an eminently sanitary and satisfactory method of garbage disposal, but as a rule it is practiced only by small places. A modification of this plan, used by cities large and small in the United States, Canada, and Great Britain, is to dump both garbage and other city refuse in successive layers of considerable depth, keeping the final level covered with dirt or ashes. This method was adopted by Seattle, Wash., after the abandonment of three refuse destructors or incinerators in 1913-15, and similarly at Ottawa, Canada, in 1918. The change from incineration to dumping and covering with earth or ashes at Seattle was made by the Health Department and was called the sanitary fill method of disposal. Mixed refuse dumps or "tips" have the sanction of the British Ministry of Health, which has issued regulations for their sanitary control. Often two objects are accomplished, refuse disposal and reclamation of low land. The plan was adopted at Dundee Scotland in 1928.

Incineration was for several decades the chief method of disposing of mixed refuse in England, where anything but dumping was used, but much British refuse was worked into the soil for its physical improvement and for such fertilizing value as the refuse might contain. Following the War, a marked change was made in British incinerating or refuse destructor practice; instead of sending all the garbage, ashes, and other refuse through the furnaces, the ashes and garbage were screened out for utilization on land; such low-grade commercial materials as paper, rags, etc., were picked out on movable belts, and only the coarser clinker and unburned coal was passed for burning. The same general method was practiced for several years at Paris. (See *Engineering News-Record*, Nov. 22, 1923.) Tests on the refuse of Munich made by the Bavarian State Institute for the Growth and Protection of Plants led to the conclusion that it would be wasteful to use for fuel the finer portions of refuse having low calorific value but rich in fertilizing material. It was concluded that the most economical use of refuse where soil deficient in humus is at hand is to devote sifted-fine refuse to agricultural purposes and to send the remaining refuse only

to the destructor. (*Zeitschrift des Bayerischen Revisionsvereins*, Nos. 7 and 8, 1921).

Reduction as a means of garbage disposal has been confined almost wholly to the United States, where the method was employed during a considerable number of years in most of the larger cities of the country which have what might be called improved means of garbage disposal. Originally, all these reduction works were built and operated by private companies under municipal contracts, but for some years, one after another was taken over by the city or else, in a few cases, municipal plants were built *de novo* or to replace the old privately owned plants. In 1929 there were municipally owned reduction plants in Schenectady, Syracuse, and Rochester, N. Y.; Philadelphia and Washington; Cleveland, Columbus, and Dayton, Ohio; Indianapolis, Ind., and Chicago. Such a plant at New Bedford, Mass., burned down in 1924 and was succeeded by an incinerator. The Syracuse plant was leased for operation for a second five-year term in 1928 to the contractor who built it. At Chicago, the garbage from a large district was deviated in 1928 to a new 600-ton incinerator, built in part because the reduction works were inadequate for the increased population and partly because incinerators were considered more economical under increased operating costs and decreased operating revenues due to a fall in the price of the grease and tankage produced by the reduction works. Other cities where the garbage was being disposed of by reduction in 1929 were Boston, Baltimore, Pittsburgh, and Detroit, in each case by private companies. Where reduction is practiced, only garbage, not mixed refuse, can be disposed of. The same is almost as true of disposal by feeding to hogs, although these animals will do much sorting over of mixed refuse.

Hog feeding as a method of garbage disposal is the general means which is employed throughout New England, and in many other cities throughout the United States, notably by the contractor for the disposal of the garbage at Los Angeles, Calif., who receives the garbage at a railway station, has it transported to the country, and feeds it to some 40,000 market hogs, under approved sanitary conditions and with the use of carefully devised mechanical appliances for distributing the garbage to the hogs, recovering, drying, and pulverizing the hog manure. (See *Engineering News-Record*, May 3, 1928, P. 692.) A corresponding method was long practiced at Providence, R. I., and Worcester, Mass., but in 1927 was superseded by incineration at Providence.

Fermentation by the *Beccari System*, named after an Italian, was practiced in Florence and some other Italian cities for several years. A demonstration plant was built by American promoters of the process at Paterson, N. J., in 1921. Late in 1923, a working-scale Beccari plant was put in operation by the village of Scarsdale, N. Y. This was followed in 1928 by a small plant at Dunedin, Fla. After a short period of use, the Scarsdale plant was shut down, on court order following complaint of nuisance; it was rebuilt along somewhat changed lines. At both these plants, the garbage is dumped into covered concrete cells from which the moisture in the garbage is drained out through a false bottom. Reports from the Italian plants are that after the garbage has remained in them for 30 days or so, it has been converted by fermenta-

tion to a substance similar to garden soil or humus, with a high fertilizing value. A considerably longer detention period is required for American garbage. For a description of the Beccari system as used in Italy, see *Engineering News-Record*, Feb. 15, 1923. For a description of the plant at Florence, Italy, see *The American City*, February, 1923, and for particulars of the Dunedin plant, consult the same journal for February, 1929.

Collection of mixed refuse generally costs more than the final disposal of the material; for economical service both of collection and of disposal, the two should be carefully correlated after engineering studies, which should be continuous in order to make readjustments necessary for economy and efficiency. Increasingly, motor-drawn vehicles are being used for collection, especially where there is a long haul after loading is completed. Theoretically, refuse collection districts should be so laid out that the material collected could be hauled to a central disposal plant in each district; this would materially reduce the haul as compared with that entailed by the use of only one disposal plant. Great practical difficulty is experienced in American cities when an attempt is made to locate district disposal plants; the people residing or doing business in the immediate vicinity usually protest that the plant will be a nuisance. The arguments advanced may be fallacious, but, when brought to bear on the councilman, they are likely to be effective, as was shown by experiences at Philadelphia, Minneapolis, and St. Louis. Most disposal plants in America are located in the outskirts of the city or beyond the municipal boundary lines, but in New York City the incinerators are being located each to serve a district. In some cases the disposal plant is so remote that special transportation after house-to-house collection has been effected is required, making use either of trailers or even or railway transportation, steam or electric. Although published some years ago, the most comprehensive book on this whole subject is Hering and Greeley's *Collection and Disposal of Municipal Refuse* (New York City, 1921). Among several British books is Thompson, *Modern Cleansing Practice* (London (1928)).

**GARBER, DANIEL** (1880- ). An American painter (see VOL. IX). Among his later awards were the first Altman Prize for figure painting, 1917, the first Clark Prize and gold medal, 1921, and the first Altman Prize for landscape (1922 and 1927). In "Buds and Blossoms," "A Summer Phantasy," and "The Hawk's Nest," he showed a continuance of interest in nature in her brighter and sunlit moods.

**GARD, ROGER MARTIN DU.** See **MARTIN DU GARD, ROGER.**

**GARDEN, MARY** (1877- ). An American soprano (see VOL. IX). In January, 1921, she was appointed director general of the Chicago Opera Association. She assumed control under most unfavorable circumstances, when the company was suffering from complications resulting from a dual directorship with divided responsibilities. In spite of all handicaps, she maintained the high standard of the performances and even added to the glory of the company with a tour which was an unequivocal artistic success, though it resulted in financial disaster. During her term as director, she continued to appear in her usual rôles. When the

new Chicago Civic Opera Company was organized in 1922, she was engaged as one of the principal artists.

**GARDEN CITIES.** See CITY AND REGIONAL PLANNING.

**GARDNER, EDMUND GARRETT (1869- )**. An English writer and Italian scholar (see VOL. IX). He was Barlow Lecturer on Dante, University College (1910-26), and Professor of Italian Studies, Manchester University (1919-23), of Early Italian Language and Literature, University of London (1923-25), and of Italian, University of London (1925- ). Among his later works are *The Book of St. Bernard on the Love of God* (1916); *The National Idea in Italian Literature* (1921); *Dante* (1923); *Tommaso Campanella and his Poetry* (1923); *Italian Literature* (1927), and *The Arthurian Legend in Italian Literature* (1928-29).

**GARDNER, ERNEST ARTHUR (1862- )**. An English classical archaeologist (see VOL. IX). He was dean of the faculty of arts, London University, in 1913-15 and vice chancellor in 1924-26. During the World War, he was in active service at Saloniki. His later works are a *Catalogue of the Museum of Oasts of Greek and Roman Sculpture at Birmingham* (1921) a collection made by him, and *The Art of Greece* (1925).

**GARFIELD, HARRY AUGUSTUS (1863- )**. An American college president, born at Hiram, Portage County, Ohio, the son of President James A. Garfield. He taught Latin and law and practiced law from 1888 to 1903 in Cleveland, Ohio. Subsequently, he became professor of politics at Princeton University (1903-08) and president of Williams College (1908- ). He has been chairman of the Institute of Politics, holding summer sessions at Williamstown, since 1920. President Wilson appointed him United States Fuel Administrator in August, 1917. The coal strike settlement did not receive his approbation, and in 1919 he resigned.

**GARIBALDI, gá-ré-bál'dé, GIUSEPPE (1879- )**. An Italian soldier, grandson of the great Garibaldi, born in Melbourne, Australia, and known as Peppino. He took part in the Greco-Turkish War in 1897 and afterward fought with the revolutionists in Venezuela, where he was imprisoned by Castro but escaped. After working on the Panama Canal under General Goethals, he entered the service of Madero in Mexico and was made chief of staff. He served in the Balkan Wars of 1912, and at the outbreak of the World War raised an Italian legion of 14,000, which fought with the Allied troops in France. When Italy entered the War, he joined her army and served with distinction. He was created brigadier general in June, 1918, and retired from the army a year later. He openly denounced the Fascists, and was forced to leave Italy following the establishment of the Fascist regime. He afterward resided principally in France and the United States.

**GARLAND, HAMLIN (1860- )**. An American author (see VOL. IX). Among his publications are *A Son of the Middle Border* (1914), *A Daughter of the Middle Border* (1921), *The Book of the American Indian* (1923), *The Trail Makers* (1926), and *Back Trailers of the Middle Border* (1928). He became a member of the American Academy of Arts and Letters in 1918.

**GARNER, JAMES WILFORD (1871- )**. An American professor of political science (see VOL. IX). Among his later writings are *Civil*

*Government for Indian Students* (1920), *Idées et Institutions Politiques Américaines* (1921), *International Law and the World War*, 2 vols. (1920), *Recent Developments in International Law* (1925), *American Foreign Policies* (1927), and *Political Science and Government* (1927). He edited *Essays on Southern History and Politics* (1914). He was Hyde lecturer in the French universities (1921) and Tagore lecturer in the University of Calcutta (1922). Since 1924 he has been associate editor of the *American Journal of International Law*.

**GARNETT, MRS. CONSTANCE (BLACK) (1861- )**. A British translator from the Russian, mother of David Garnett (q.v.). Her many translations include: All the novels of Ivan Turgenev (1894-96), as well as his *Dream Tales and Prose Poems* (1916) and *The Two Friends and Other Stories* (1921); *The Kingdom of God is Within You* (1894), *Anna Karénina* (1901), and *War and Peace* (1904), by Leo Tolstoy; *The Storm*, a play, by Ostrovsky (1899); *The Revolt of the Potemkin*, by Konstantin Feldmann (1908); all the novels of Feodor Dostoevski and Nikolai Gogol, and most of the plays of Anton Chekhov; *The Letters of Anton Tchekhov to his Family and Friends* (1920); *The Letters of Anton Pavlovitch Tchekhov to Olga Leonardovna Knipper* (1925); *My Past and Thoughts*, being the memoirs of Alexander Herzen (6 vols, 1924-27), and *Mirgorod*, stories by Gogol (1928).

**GARNETT, DAVID (1892- )**. An English novelist, a partner in the Nonesuch Press, who was educated at the Royal College of Science, South Kensington. He translated and edited *The Kitchen Garden and its Management*, by Professor Gressant. He wrote *Lady Into Fox* (1923), *The Man in the Zoo* (1924), *The Sailor's Return* (1925), and *Go She Must!* (1927).

**GARNETT, PORTER (1871- )**. A writer, critic, and play producer, born in San Francisco. He edited the Grove Plays of the Bohemian Club in 1918 and has published *The Bohemian Panama-Pacific International Exposition, Stately Homes of California*, and *A Documentary Account of the Beginnings of the Laboratory Press* (1927). He became associate professor of graphic arts at Carnegie Institute of Technology in 1922 and established there in 1923 the Laboratory Press, the first private press devoted to educational purposes.

**GAROFALO, gá-rô-fá-lô, RAFFAELE, BARON (1852- )**. An Italian jurist and senator (see VOL. IX). His later publications, many of them speeches before the Senate, include *Sull' Ordinamento Giudiziario* (1914); *La Neutralità dell' Italia* (1914); *Per l'Assicurazione Obbligatoria contro gli Infortuni sul Lavoro in Agricoltura* (1917); "Enrico Pessina, Filosofo e Legislatore" (in vol. xlv of the *Atti della Reale Accademia di Scienze Morali e Politiche*, 1918); and *I Delinquenti Abituati, gli Scioperi, il Bolscevismo* (1919). His *Criminology* (1885) was translated into English (1914) as the seventh volume of *Modern Criminal Science*, and a new and enlarged Italian edition was published in 1922.

**GARRETT, ALEXANDER CHARLES (1832-1924)**. An American Protestant Episcopal bishop (see VOL. IX). On the death of Daniel Sylvester Tuttle in April, 1923, he became presiding bishop. At that time, he was 91 years old and totally blind.

**GARRETT, GABET (1878- )**. An American economist and journalist, born at Pana, Ill,

He was financial writer on the New York *Sun* (1903-05), New York *Times* (1906-07), *Wall Street Journal* (1907-08), New York *Evening Post* (1909-12), editor of the New York *Times Annalist* (1912-14), and assistant editor of the New York *Tribune* (1916-19). He has written *Where the Money Grows* (1911), *An Empire Belleguered* (1916), *The Blue Wound* (1920), *The Driver* (1921), *The Mad Dollar* (1921), *The Cinder Buggy* (1922), *Satan's Bushel* (1923), *Harangue* (1927), *The American Omen* (1928), and many essays of an economic and political nature. He contributed regularly to the *Saturday Evening Post* and other magazines.

**GARRETT, JOHN WORK** (1872- ). An American diplomat and banker, born in Baltimore and educated at Princeton. He was appointed Ambassador to Italy on Aug. 5, 1929. Mr. Garrett was a secretary to the American legations at The Hague (1901-05), Berlin (1905-08), and Rome (1908-10), and served as Minister to Venezuela (1910-11), to Argentina (1911-14), and to The Netherlands and Luxemburg (1917-19). From 1914 to 1917, he was at the American Embassy in Paris as a special agent of the Department of State, and he was chairman of the special diplomatic mission which negotiated a treaty with Germany regarding prisoners of war, signed Nov. 11, 1918. He also served as secretary general of the Washington Conference on Limitation of Armaments (1921-22). He was a delegate-at-large from Maryland to the Republican National Conventions of 1920 and 1924.

**GARRISON, FIELDING HUDSON** (1870- ). An American physician, known especially as a historian, librarian, and editor, born in Washington, D. C., and educated at Johns Hopkins and Georgetown universities. He entered the army medical service and was made a colonel in the Medical Corps, United States Army, in 1920. He was assistant librarian in the Surgeon General's Library (1889-1922), and editor of the *Index Medicus* from 1903 to 1927, when he became associate editor of the *Quarterly Cumulative Index Medicus*. His chief publications comprise *An Introduction to the History of Medicine* (1913, 3d ed., 1928); *John Shaw Billings, a biography* (1915); *Notes on the History of Military Medicine* (1922); *History of Pediatrics* (1922); *History of Neurology* (1925); and *The Principles of Anatomic Illustration before Vesalius* (1925).

**GARVIE, REV. ALFRED ERNEST** (1861- ). A British Congregationalist theologian (see VOL. IX), principal of Hackney and New College since 1924. He was president of the National Free Church Council (1924-25). His later publications include *The Missionary Obligation* (1914), *The Evangelical Type of Christianity* (1915), *The Purpose of God in Christ* (1919), *The Christian Preacher* (1920), *The Old Testament in the Sunday School* (1921), *The Beloved Disciple* (1922), *The Christian Doctrine of the Godhead* (1925), and *The Preachers of the Church* (1926).

**GARVIN, JAMES LOUIS** (1868- ). An English journalist and Imperialist, born at Birkenhead, Cheshire. By his early writings in various papers, he made himself popular as a brilliant publicist. He was editor of the weekly *Outlook* (1905-06), the evening *Pall Mall Gazette* (1912-15), and *The Observer* (1908- ). The circulation and prestige of the latter increased enormously with his editorship. He pub-

lished *Imperial Reciprocity* (1903), *Compatriot Club Lectures* (1906), *Tariff or Budget* (1909), *The Economic Foundation of Peace* (1919), and other books, the majority of them giving proof of his affinity with the Unionist Party. In 1920 he was appointed to write the official biography of Joseph Chamberlain, whom he had supported since the latter was appointed colonial secretary in 1895.

**GARY, ELBERT HENRY** (1846-1927). An American corporation official (see VOL. IX). In 1917 he was appointed a member of the United States section of the international high commission, later resigning. He remained at the head of the U. S. Steel Corporation until his death.

**GARY, HAMPSON** (1873- ). An American lawyer and diplomat, born at Tyler, Tex., and educated at the University of Virginia. In 1894 he was admitted to the bar and engaged in private practice and politics. In 1914 he became connected with the Department of State as a special war counsel. From 1917 to 1919, he was in Egypt as diplomatic agent and consul general, with the rank of minister resident. In 1919 he was in Paris with the American Commission to Negotiate Peace and in the following year was made Minister to Switzerland. After 1921 he practiced law in Washington, D. C.

**GAS**, See CHEMISTRY, Applied.

**GAS**, IN WARFARE. See CHEMICAL WARFARE, STRATEGY AND TACTICS.

**GAS**, NATURAL. See NATURAL GAS.

**GAS ENGINES**, See INTERNAL COMBUSTION ENGINES.

**GASES**. See CHEMISTRY.

**GASOLINE**. See CHEMISTRY, APPLIED; PETROLEUM; MOTOR VEHICLES; NATURAL GAS.

**GASPARRI, CARDINAL PIETRO** (1852- ). A Papal Secretary of State, born in Ussita, Italy. He was professor of canon law in the Catholic Institute in Paris (1880-86), apostolic delegate to Ecuador, Bolivia, and Peru (1898), and was made a Cardinal in 1907. He became Secretary of State in 1914 under Pope Benedict XV and was continued in that office by Pius XI. He negotiated with Premier Mussolini the treaty between the Vatican and the Italian government, ratified in 1929. See ITALY.

**GAS TURBINES**. See INTERNAL-COMBUSTION ENGINES.

**GAS WORKS**. See MUNICIPAL OWNERSHIP.

**GAULT, ROBERT HARVEY** (1874- ). An American psychologist, born at Ellsworth, Ohio, and educated at Cornell and Clark universities. He has been a member of the faculty of Northwestern University since 1909. In 1924-27 he was temporarily on leave with the National Research Council at Washington, D. C. Since 1927 he has been associated with the Carnegie Institution of Washington. In 1911 he became the editor of the *Journal of the American Institute of Criminal Law and Criminology*. After 1914 he also edited *Criminal Science Monographs*. He was part author and editor of the report of the Chicago Council for the Investigation of Crime (1915).

**GAUTHIER-VILLARS, GABRIELLE SIDONIE**. See COLETTE, MME.

**GAUTIER, götyä (CHARLES) LUCIEN** (1850-1924). A Swiss theologian (see VOL. IX), who was president of the Pastorale Suisse (1916-17), the Société Suisse des Vieux Zofingiens (1915-19), and the board of delegates of the South African Swiss Mission (1918-20).

In 1919 he became a member of the International Committee of the Red Cross. His later publications include *Le Prophète Jérémie* (1916), *Pflicht und Wille, devoir et volonté*, with Karl Scheurer (1916), and *Études sur la religion d'Israël*, edited by A. and L. Gautier (1927).

**GAUVAIN, gō'vān', AUGUSTE** (1861- ). A French editor and publicist, born at Vesoul, and educated in law at the University of Paris and the École des Sciences Politiques. He became in 1908 foreign editor of the powerful and conservative *Journal des Débats*. A member of the Academy of Moral and Political Science, Gauvain was a prolific writer on questions of current politics. The list of his writings includes *Les Origines de la guerre européenne* (1915), *L'Europe avant la guerre* (1917), *L'Affaire grecque* (1917), *La Question yougo slave* (1918), *L'Encerclement de l'Allemagne* (1919), and *L'Europe au Jour le Jour*, beginning with the Bosnian crisis of 1908-09 and including the treaties of 1919 (14 vols., six of which were crowned by the Institute, 1917-23). Gauvain also wrote Books I and III of the ninth volume of the *Histoire Contemporaine de France* and frequently contributed to the French periodical press.

**GAYLEY, CHARLES MILLS** (1858- ). An American author (see VOL. IX). He was dean of the faculties (1918-20) and co-administrator of the presidency (1919) of the University of California. He became research lecturer in 1921 and professor emeritus in 1923. Among his later works are *Shakespeare and the Founders of American Liberty* (1917), *The Gayley Anniversary Papers* (1922), and, in collaboration, *Lyric, Epic, and Allied Forms of Poetry* (1919).

**GAYLORD, FRANKLIN AUGUSTUS** (1856- ). An American clergyman and social worker, born at Yonkers, N. Y., and educated at Yale University, Union Theological Seminary, and the Collège de France. In 1887-93, he was general secretary of the Young Men's Christian Association at Paris, France. In 1894 he was ordained in the Presbyterian ministry. He was in St. Petersburg as general secretary of the Russian Y. M. C. A. (1899-1911), and in 1911 he was made director of the Russian Society for Moral and Physical Development of Young Men. In 1916 he was secretary of the American Hospital for Wounded Russian Soldiers, and in 1918-19, secretary of the International Committee of the Y. M. C. A., which he also represented in Odessa, Russia (1919-20), and other cities. He is the author of English translations of Russian verse.

**GEDDES, gē'dēs, THE RT. HON. SIR AUCLAND CAMPBELL** (1879- ). A British scientist and diplomat, educated at Edinburgh University. He was professor of anatomy at Edinburgh, Dublin, and McGill University, Montreal, and principal of McGill University (1910-20). He served in the South African War, and in the World War until 1916, when he became Director of Recruiting. In 1917 he resigned to become Minister of National Service (until 1919), and he entered Parliament as a Unionist (1917-20). He was president of the Local Government Board (1918), Minister of Reconstruction (1919), president of the Board of Trade (1919-20), British Ambassador to the United States (1920-24), and chairman of the Royal Commission on Food Prices (1924-25). In 1922 he was made Knight of the Grand Cross of St. Michael and St. George.

**GEDDES, THE RT. HON. SIR ERIC (CAMPBELL)** (1875- ). A British politician, born in India and educated at Oxford Military College and Merchiston Castle School in Edinburgh. He first acquainted himself with railways in the United States (Baltimore & Ohio system) and in 1906 became manager of the Northeastern Railway Company in England. On the outbreak of the World War, he became Deputy Director General of munitions supply (1915-16), Director General of transportation on the staff of the Commander-in-Chief of the British Armies in France (1915-16), and Director General of military railroads and Inspector General of transportation in all the theatres of the War (1916-17). To him was credited the efficiency of British communication in France. From 1917-22 he was a Unionist member of Parliament for Cambridge. He was First Lord of the Admiralty (1917-18), a member of the Imperial War Cabinet (1918), Minister without Portfolio (1919), and Minister of Transport, a new position (1919-21). He proposed the reorganization bill for the railways in the spring of 1921. That August, the Chancellor of the Exchequer appointed him chairman of a committee to advise on all questions of national expenditure (1921-22). He was president of the Association of Trade Protection Societies of the United Kingdom (1923), and of the Federation of British Industries (1923-24). He was the head of various British tire and rubber industries, and Chairman of Imperial Airways, Limited.

**GEHRING, JOHN GEORGE** (1857- ). An American physician, neurologist, and psychiatrist, born in Cleveland, Ohio. He was graduated in medicine from the Western Reserve University in 1885 and after practicing for some years in Cleveland did post-graduate work in the University of Berlin (1891). Returning to the United States, he located in Bethel, Me., where since 1895 he has specialized in functional nervous and mental maladies, acquiring eminence in these fields. In 1923 he published *The Hope of the Variant*. In 1927 William Bingham II of Bethel, in recognition of the value of Dr. Gehring's work in psychiatry, gave \$200,000 to the psychiatric ward of the Neurological Institute of New York City.

**GEIKIE, gē'ki, SIR ARCHIBALD** (1835-1924). A British geologist (see VOL. IX). He was Governor of Harrow School (1892-1922). Among his later writings are *The Birds of Shakespeare* (1916), *Annals of the Royal Society Club in the Eighteenth and Nineteenth Centuries* (1917), *John Mitchell, M.A., F.R.S., of Queen's College, Cambridge, 1724-93* (1918), and *A Long Life's Work, an Autobiography* (1924).

**GELL, WILLIAM EDGAR** (?-1925). An American explorer and author, born at Doylestown, Pa., and educated at Lafayette College. He made journeys into Western Asia, China, and Africa, penetrating as far as Mt. Douglas, to study primitive races. He lectured on his observations in Australia, Japan, China, India, Great Britain, and the United States. In 1919-20 he explored the five sacred mountains of China. Among his works may be mentioned *The Great Wall of China* (1911) and *Adventures in the African Jungle Hunting Pygmies* (1917).

**GELERT, gēl'ert, GRETE MEISEL-HESS** (1879-1922). An Austro-German writer, born at Prague. She spent five years at the University of Vienna in the study of philosophy, sociology,



and biology, and was also a pupil of Freud. Her reputation rests on her works on the sex problem, on woman, and marriage. They are *Die Sexuelle Krise* (1909), which has been translated into English; *Betrachtungen zur Frauenfrage* (1914); *Krieg und Ehe* (1916); *Das Wesen der Geschlechtlichkeit* (1916); *Die Bedeutung der Monogamie* (1917); and *Die Ehe als Erlebnis* (1919).

**GELS.** See **CHEMISTRY.**

**GENERAL EDUCATION BOARD.** See **UNIVERSITIES AND COLLEGES.**

**GENERAL STAFF.** See **ARMIES AND ARMY ORGANIZATION.**

**GENERATORS, ELECTRIC.** See **ELECTRIC POWER STATIONS AND GENERATING APPARATUS.**

**GENETICS.** See **HEREDITY; ZOÖLOGY.**

**GENEVA.** (*French* Genève, *German* Genf). A city of Switzerland, the capital of the canton of Geneva (see **VOL. IX**), situated at the southwest extremity of the Lake of Geneva at the outlet of the Rhone River, which divides the city in two equal parts. The number of inhabitants was 125,520 according to the census of 1910; 135,059 by the census of 1920; the estimated population in 1925 was 126,000, and 134,350 in 1928. Of the inhabitants in 1920, 50 per cent were Protestants and 43 per cent Catholics; while 32 per cent were foreigners. Geneva is the third city of Switzerland, Zurich and Basel being larger. It is fast becoming an international city, being the seat of the League of Nations (first Assembly meeting on May 15, 1920), the International Red Cross, and the International Labor Office of the League of Nations. Many international meetings and conferences, such as that for the non-fortification and neutralization of the Åland Islands (1921), the Passport Conference (1926), or the International Economic Conference (1927), have taken place in Geneva. After Paris it is the most important centre of French intellectual life in the world.

In 1917 an imposing international Reformation Monument, projected in 1907, was finished; the architects were Swiss; Dubois, Lavarrière, Monod, and Taillens, and the sculptors French, Bouchard (q.v.) and Landowski. It is over 100 yards long, has high reliefs of the leaders of the Reformation and their political champions, and has reliefs of the chief events of the movement. From 1923 to 1925, a plain concrete four-storied building designed by Georges Epitoux of Lausanne, was built for the International Labor Office, close to the Botanic Gardens. In September, 1929, the cornerstone was laid of the new \$5,000,000 edifice that will house the League of Nations in Ariana Park. The dominating part of the structure will be the Assembly Hall, which will be connected on the left with the library and on the right with the council chamber and the Secretariat. The library is the gift of John D. Rockefeller, Jr., who donated an additional fund of \$1,000,000 for its maintenance. The plans are the composite work of five architects: Henri Nenot and Camille Lefèvre of Paris, Julien Fliegerheimer of Geneva, and Professor Giuseppe Vago and Carlo Broggi of Rome. The League was formerly housed in the Salle de la Réformation and the old Hôtel National on the Quai Woodrow Wilson.

**Bibliography.** *Catalogue de la Section des Archives de la Guerre*, published by the Bibliothèque publique et universitaire de Geneva (1919); *Geneva: Its Place in the World*, by Con-

stance and Julian Grande (1920); *Der Genfer Zonenstreit*, by Dr. Paul Köhler (1926); Baedeker's *Switzerland* (1928); the *Annual Report* of the Chamber of Commerce of Geneva; *Genève; cité des nations* (2 vols., published annually); and the annual *Compte rendu de l'administration de la Ville de Genève* published by the municipal council.

**GENEVA CONFERENCE.** The unsuccessful Geneva Conference for the limitation of naval armaments called by the President of the United States was held at Geneva, Switzerland, June 20-Aug. 4, 1927, with Great Britain, Japan, and the United States participating. France and Italy, who had refused invitations, were interested onlookers. The conference failed primarily because the United States and Great Britain could not agree on the size of cruisers they should build in completing the total cruiser tonnages tentatively arrived at. The Americans desired to build up a considerable portion of the allotted tonnage in 10,000 ton cruisers with 8-inch guns; the British wished to restrict cruiser construction almost entirely to ships of 7500 tons, and to construct a larger total tonnage than the Americans thought necessary. No great difference developed between the three powers with regard to the limitation of destroyers and submarines. The failure of the conference was followed by the adoption of an increased naval building programme by the United States Congress, designed to establish parity with Great Britain, and other evidences of a growing naval competition. Lord Robert Cecil, one of the British delegates at Geneva, resigned from the Conservative Government Aug. 27, 1927, in protest against its policy at the conference. The failure of the conference contributed to the overthrow of the Conservative government in the general election of 1929, the Labor Party having as one of its campaign pledges the elimination of the growing naval rivalry with the United States. See **WASHINGTON CONFERENCE.**

**GENOA**, jën'ô-ä. An important maritime centre of Italy. The population in 1926 was 333,320. By a decree of Jan. 14, 1926, greater Genoa was created, with a population of 541,582. It is the hope of Italy to make Genoa the largest port on the Mediterranean and the most important entrepôt for sea-borne traffic to and from central Europe. Since 1923 the port has undergone a considerable commercial development. Traffic increased from 6,300,712 tons of goods shipped in 1923 to 8,248,830 tons shipped in 1925. In 1927, 5103 vessels of 9,167,950 tonnage entered the port, and 5054 vessels of 9,011,057 tonnage were cleared. In 1923 the Italian government placed at the disposal of the local administration a sum of 310,000,000 lire to be expended for port improvements over a period of six years, terminating in 1929. These improvements include a new maritime station constructed at a cost of about 14,000,000 lire; a new drydock, 240 meters (787.4 feet) long and 32 meters (104.9 feet) wide, costing 32,000,000 lire; 800 meters (2624.6 feet) of quays added to the Vittorio Emanuele Dock; and a protective breakwater built of cyclopean masonry, the large concrete blocks weighing about 500 tons each. This work has been constructed for a length of 1450 meters (4757.2 feet), sufficient to shelter the basin adequately.

Further railway electrification has been accomplished in northern Italy, and the section between Genoa and Leghorn opened. From

Leghorn to Mondane on the frontier, the whole line has been electrified and is the longest stretch in Europe. An electric funicular railway between the districts of Borgoratti and Apparizione is to be constructed, the total length of the line being about 4500 meters (2.7 miles) with an average gradient of 22 per cent. Each car will accommodate 44 persons. On account of its location among high hills that reach down to the sea, Genoa requires several funicular railways and many elevators to insure easy and convenient transportation between the lower and upper levels of the city. In 1925 a civil air line was inaugurated between Palermo and Genoa.

The Piazza de Ferrari is the heart of Genoa's business district. On one side of the square are buildings of Old Genoa, the walls of palaces for the most part; on the opposite side is New Genoa, including the Bourse, the Post Office, and the Academy of Fine Arts. From the Piazza de Ferrari starts the most beautiful of modern thoroughfares in Genoa, the Via Venti Settembre, lined with fine modern palaces and substantial business buildings of recent construction. This main street leads to the Piazza Verdi where is the new Brignole Station and to the new city district beyond the Bisango River. Near the Piazza de Ferrari is the house in which Columbus spent his boyhood and which has been converted into a historic shrine. When the tenements that flanked the house were torn down, the slender building could not safely be left standing. The three upper stories were removed, and the two lower ones were roofed over. In 1915 a monument was erected at Quarto dei Mille to mark the point of embarkation for Sicily in 1860 of Garibaldi and his 1000 volunteers.

**GENOA CONFERENCE.** See PEACE CONFERENCE AND TREATIES; REPARATIONS. See also sections on *History* under GERMANY and RUSSIA.

**GEOGNOSY.** See GEOLOGY.

**GEOGRAPHICAL SOCIETY, AMERICAN.** A society established in 1852 for the dissemination of geographical information. From November, 1917, to December, 1918, it was the headquarters of a body of experts known as "The Inquiry," which studied conditions in Europe during the World War under the direction of the U. S. Department of State; later the director of the Society and some of these experts attended the Peace Conference where they served on various territorial and economic commissions. In 1919 the Society conducted a survey of the boundary between Guatemala and Honduras, at the requests of the governments concerned, to establish a basis for the recommendation of the Secretary of State of the United States for a final boundary in the disputed region. In the following year, the Society inaugurated a programme of research in the geography of Hispanic America; in 1925 the first of the publications devoted to this undertaking appeared under the title, *Map of Hispanic America Publications*; and by 1928 many of the maps of this series, on a scale of 1:1,000,000, to conform with the International Millionth Map of the World, were ready for distribution. The Society in 1921 assisted the Department of Justice in the study of the Red River Boundary in dispute between Oklahoma and Texas, and in the same year sent W. L. G. Joerg on a mission to Europe for the purpose of studying the status of geography in European universities and geographical institutions. In 1925 the numbers of the *Research*

*Series* of the Society dealt with the geographical lore of the time of the Crusades and with Bering's voyages. In 1926 there appeared two issues of the *Outing Series*; "A Trampers' Guide to the Palisades Interstate Park" and a "Trampers' Guide to the Vicinity of New York City"; as well as a volume on the physical geography of the Lesser Antilles, by Prof. W. M. Davis, and the first volume of another series, *Oriental Explorations and Studies*, which deals with the explorations of Prof. Alois Musil in the Northern Hedjaz, Arabia.

The *Geographical Review* (monthly, 1916-1921; quarterly, since 1921) superseded the *Bulletin of the American Geographical Society*, in 1916, as the official publication of the society. Valuable additions were made to the society's specialized geographical library throughout the years 1914-1929, and six regular lectures were delivered annually before the members and their guests by distinguished explorers or geographers. The Society recognizes contributions to the development of geographical science and exploration in its election to honorary and corresponding memberships and in the bestowal of medals. The President in 1928 was John H. Finley, LL.D., and the director, since 1915, has been Isaiah Bowman, Ph.D. The Society's building is at Broadway and 156th Street, New York City.

**GEOGRAPHIC SOCIETY, NATIONAL.** An organization founded in 1888 for the increase and diffusion of geographic knowledge. Among the most important of its recent activities were the six expeditions to Alaska, under Dr. Robert F. Griggs, which, in investigating the eruption of Mt. Katmai, discovered the new crater and the remarkable fumarole region described in *The Valley of Ten Thousand Smokes*, published in December 1922, as the final step in the Mt. Katmai research. Further volcanic studies were carried on in 1928 in the Pavlof volcano region off the Alaskan Peninsula; the expedition, under Dr. Thomas A. Jaggar, volcanist in charge of the work at Hawaii, accumulated information which will aid in forecasting eruptions; discovered evidence in favor of the continental drift theory; and found a new type of ice-ash jumble.

The chief archaeological work of the National Geographic Society was the excavation of Pueblo Bonito, at Chaco Canyon, New Mexico. During eight expeditions, under Dr. Neil M. Judd, the last in 1927, Pueblo Bonito was established as the most populous centre of early Indian culture north of the Rio Grande River. The civilization was divided into four periods, those of the basket makers, the pottery makers, the slab-house builders, and the apartment-house dwellers; the last-named leaving Pueblo Bonito, a building at least 1000 years old, which had 300 rooms on the first floor, and was probably about five stories high. By means of Dr. A. E. Douglass's discovery of the relation between tree-ring formations, and the 11-year sun-spot cycle, the duration of the entire Bonitian period has been approximated, and a calendar, covering the time between the old Spanish régime and the present, drawn; but in order to estimate the age of the Pueblo Bonito, the lapse between the two civilizations must be measured, and in 1929 Dr. Douglass was still working, with some success, to find beams or timber grown in the interval. Although discoveries made in 1925 enabled Dr. Judd to reconstruct the customs of the Bonitians, and to ascertain that there was no connection between the pre-Columbian Indian and the Egypt-

tian or any other early European civilization, it was found in 1926 that the same general method of irrigation was used in America as in the earliest known history of the Nile or the Euphrates. Other important archaeological work was accomplished under Dr. Byron Cummings in 1925, establishing a mound at Cuicuilco, Mexico, as the earliest known human habitation in the Western Hemisphere, dating back, according to Dr. N. H. Darton, over 4000 years, pre-Aztec and pre-Toltec.

An expedition valuable to several sciences was that under Donald B. MacMillan, who, with the coöperation of the U. S. Navy, explored North Greenland and Ellesmere Island in 1925. During that trip Richard E. Byrd, piloted by Floyd Bennett, commanded the first airplane flights across the North Pole. An extensive study of Arctic birds, fishes, flowers, and animals was made and Jacob Gayer obtained the first accurate colored photographs of the region. Useful facts were discovered concerning magnetic and tidal phenomena, and temperature and wind velocity in relation to aviation and weather forecasting. Again supporting polar research, the Society contributed \$25,000 in 1927 for the expedition to the Antarctic undertaken by Commander Byrd in the autumn of 1928.

A solar radiation station was established in 1926 at Mt. Brukkaros, South Africa, under the auspices of the National Geographic Society and the Smithsonian Institution, for the purpose of determining the relation between solar radiation and weather, which would make long-range weather forecasting possible. In the following year, it was shown that the fundamental cycles of the sun's radiation, 25½ months, and the known weather cycles of the past correspond, and that the prophecies of Dr. Dayton C. Miller's machine for analysis and synthesis of sun and weather curves have been closely fulfilled. The theory of the relationship was substantiated by further observations in 1928. It was also observed that there is a connection between static conditions and solar radiation.

The membership of the Society increased from 300,000 in 1914 to 1,200,000 at the beginning of 1929. Its chief educational organ is the *National Geographic Magazine*, and it also sends weekly or daily bulletins to newspapers and other agencies; by 1928 it furnished about 35,000 school teachers with current geographic news. Upon request, it sends each year about 80 church and Sunday-school periodicals information about Biblical lands. In 1925 the Society undertook the preparation of a series of State maps of America. The president and editor-in-chief of the magazine in January, 1929, was Gilbert Grosvenor; vice president and associate editor, John Oliver LaGorce; treasurer, John Joy Edson; and secretary, O. P. Austin. Headquarters are at Washington, D. C.

**GEOLOGY.** Progress in this science since 1914 has been substantial. It depended upon widespread activities in the different branches carried on by many workers and supported in part by governmental subsidies. If anything may be described as distinctive in the general trend of studies, it was undoubtedly the emphasis on the practical phases, economic or political geology, for which the World War may be held responsible. This tendency still may be discerned in the output of most public surveys, which were inclined to give less attention to subjects of theoretical interest than they formerly

did and was further illustrated by the growing participation of geologists in industrial fields, chiefly oil and natural gas production and mining. The literature relating to mineral deposits has expanded tremendously in consequence. The economic phases now hold a dominant place in the science, so far as general interest is concerned.

Among recent works of broad scope may be named *Geology of the Earth*, to give the English title, now in course of preparation by an international body of experts under the leadership of the German geologist, Krenkel. So far the volumes relating to Africa and Europe have appeared (1925-28), and the one for North America will be ready at a near date. The general plan of the work is to present a comprehensive summary of present-day knowledge about the structure, stratigraphy, topography, and mineral resources of each continent.

**General Geology. GEOGNOSY.** The effects of radioactive energy on the cooling of the earth have been given a quantitative expression; they put a new aspect on estimates of geological time. The presence of radioactive substances in all the constituents of the crust may be regarded as definitely established by the work of Strutt and others. The heat given off in this way would appear to counterbalance almost completely the loss by conduction and radiation of the original stored heat; perhaps it exceeds such loss under certain conditions. The cooling process, anyway, is very slow. Lord Kelvin's classic studies, made before the discovery of radium, indicated a maximum of 40,000,000 years for the age of the earth; that is, the time required for it to have cooled to its existing state, an estimate which geologists for the most part accepted, even though a more liberal figure would have accorded better with their own data. On the new basis, the period of earth evolution would be lengthened to many times that amount, and 1,000,000,000 years is regarded as not improbable. Arthur Holmes calculated from the atomic disintegration of uranium, which proceeds at a known rate, that the oldest igneous rocks exposed at the surface, largely granites, probably originated 1,500,000,000 years ago. The fossiliferous rocks extending back to Cambrian time, which is the span of historic geology, were accumulated in a minimum of 550,000,000 and a maximum of 700,000,000 years, according to Barrell, who would assign a period of similar magnitude for the Pre-Cambrian formations.

That the earth as a whole has a high degree of rigidity comparable to steel, was deduced by Michelson from experimental observations of tidal movements in the solid rocks. The old theory of a thin envelope about a fluid body would appear untenable on a physical basis. It is probable that the interior is very hot, sufficiently so to melt any rock material under atmospheric conditions, but the pressure produces a degree of immobility approaching a solid for the body as a whole. Other indications of deep-seated conditions are found in the study of earthquake tremors, the heaviest of which are world-wide in their travels but do not pass directly through the earth in the shortest paths and appear to pursue a curved course. They indicate a zonal structure. Oldham inferred that three concentric layers exist, of which the crust or lithosphere is the thinnest, not more than 40 miles in depth. The next layer, asthenosphere, is possibly 2000

miles thick and is rigid under stress of short duration so as to transmit vibrations from distant sources. The innermost layer, the core, is likewise very thick and seems to effect tremors, indicative of a viscous condition rather than of a rigid solid. The temperature gradient calculated from observations made in deep shafts and borings affords a method of estimating the thickness of the crust. Daly collected data from Europe and America on which he based the conclusion that 40 kilometers (roundly, 25 miles) is the most likely figure for the outer layer. The later methods and points of view of geophysicists will be found in Joly's *The Surface-History of the Earth* (1925), and Gutenberg's *Lehrbuch der Geophysik*, the latter issued in installments of which the first appeared in 1926.

The thesis propounded by Wegener that the continents are subject to a slow horizontal displacement by the tidal action of the sun and moon has been examined by geologists but so far has found little favor. The main arguments for its support are the similarities of rock formations in Europe and North America, also of the stratified formations and their faunas in South Africa and South America. Such drift would imply that the continents are buoyed up on a heavy viscous layer, whereas the evidences already noted indicate a high degree of immobility for the outer earth zone.

Experimentation with mineral melts analogous in composition to some of the simpler igneous rocks has provided some new information about the crystallization of these materials. One of the problems that have been given attention is the cause of variation in igneous intrusions, the process of magmatic differentiation, so-called. An original mass of magma of uniform composition may split during consolidation into several types of variant textures and mineral ingredients. Bowen in *The Evolution of the Igneous Rocks* (1928), would explain these effects as a result of the crystallizing process, itself a natural inherent influence in all magmas. The process may be considered as occurring in two stages, an early stage when crystal settling is the main feature, and a later stage in which pressure acts to compress the crystal mass and to squeeze out the residual liquid which is later cooled to the crystallizing point. The one or the other agency, or their combined operation, serves to explain magmatic differentiation. From theoretical considerations purely, other writers have argued in favor of the effects of liquid immiscibility, convection currents, and melting of foreign materials; and it is recognized that the subject is still open to investigation.

The structure of coral reefs, about which Darwin's theories have been generally accepted as most satisfactory, was given renewed consideration by several geologists. Daly remarked certain features of atolls, for example the flat floors that characterize some of the basins enclosed by the rings of coral, which seem inconsistent with reefs built around subsiding volcanic islands. He suggested that the corals may have built upward on relatively flat platforms produced by wave cutting at a time when the sea was at a lower level than now. The water stored up in the form of ice during the Pleistocene period may have caused a lowering of tidal waters by as much as 150-300 feet, when waves could have eroded benches and platforms well below the present range of their activity. On

them, the corals started their operations anew as soon as the waters reached a favorable temperature.

According to Davis, whose *The Coral Reef Problem* (1928) represents the results of new investigations at first hand, the flat floors of atoll lagoons can be explained by the leveling effects of sedimentation in periods of intermittent subsidence of the islands; coral reefs also occur on many of the Pacific islands that bear no marks of a cessation of growth that would be expected if the seas had been lowered and cooled during Pleistocene time. Borings on the Funafuti atoll were interpreted by Skeats as evidencing a slow, progressive, upward growth, without any breaks in the succession of coral rock corresponding to the estimated position of a glacial platform. Most of the coral species found at depth still exist in the vicinity. The evidence from that locality supports Darwin's conclusions. In the West Indies and Florida, Vaughan found that all offshore reefs have grown on recently depressed platforms and that there are no instances of long-continued submergence of coral areas or of the development of barrier reefs from fringing reefs. The work of corals as constructional agents is not of first importance in that region; other organisms like bacteria, foraminifera, and mollusks contribute more to rock formation by abstraction of calcium carbonate from sea water.

**Dynamic Geology.** ISOSTASY has acquired rank as a working principle among most of the American geologists, apparently, who have given attention to the problem of slow crustal movements. The work of Haysford and later of Bowie, both of the United States Coast and Geodetic Survey, has given strong support to the theory. Accurate gravity determinations were assembled by Bowie from the United States, Canada, India, and other countries, representing all conditions of topographic relief, and they were found to fall in line with previous deductions. Isostasy, it may be explained, assumes that every variation of topographic relief is accompanied by a variation of density of the underlying rock column down to a uniform level, that of isostatic compensation. Thus, mountain areas are deficient in density, while oceanic depths are of relatively high rock density. Denudation of an elevated surface causes or is compensated for by a rising of the area, whereas loading of a depression is accompanied by sinking. Bowie regards the compensation as practically complete at a depth about 60 kilometers for the United States as a whole; in mountain regions the depth is greater, 95-111 kilometers. Compensation is effected by a flow of material at the mentioned depths, in accordance with the fluctuating load at the surface. The more recent developments in this field are included in the volume *Isostasy*, by Bowie (1927).

Exemplifications of the broad crustal swings both up and down that seem to call for explanation by the isostatic principle is to be found in the changes of level in northeastern North America during Pleistocene time. At the beginning of the ice invasion, the region was higher than it has been at any subsequent period, although the exact relation of the surface with reference to sea level can be stated only in general terms. Over this surface, which was perhaps from 1000 to 5000 feet higher than now, spread a thick mantle of ice which collected first in the Labrador and Laurentian highlands

and moved gradually to the south and south-west, finally covering an area of several hundred thousand square miles to an extreme depth of perhaps 5000 feet. Following the maximum ice accumulation, the land surface began to sink under the weight, the movement continuing until the ice had retreated from the southern part of the region and until a considerable area had been depressed nearly to sea-level and marine waters invaded a smaller portion of it. The general withdrawal of the ice from the whole region so lightened the crust that an adjustment by releveling took place. This last movement has reached a maximum, according to Fairchild, of 1000 feet in the area between the St. Lawrence River and James Bay, the measurement being based on the altitudes of marine deltas formed by streams that flowed into the sea at the time of maximum depression. The elevation increased from south to north.

The relation of folds and faults to isostatic adjustment remains an outstanding problem, about which opinion, as yet, has found little common ground. The view that they represent the effects of stored-up stresses finding sudden relief is in apparent conflict with the evidences for a relatively thin crust that responds easily to variations of load. Folds and overthrust faults represent the effort of the crust to adjust itself to a shrinking circumference. R. T. Chamberlin, in a study of the Colorado Rockies, found that the amount of shortening was 8 miles in a distance of 140 miles across the axis of the main uplift. The depth to which the rocks were affected by disturbance ranged from 13 miles minimum to 107 miles maximum. In the Coast and Sierra Nevada ranges, adjustments occurred mostly by faulting, according to Willis. The faults, which are high-angle thrusts, resulted from compression that brought about rotation of the mountain blocks along the fault planes. The cause of rotation was stress, set up by erosion and sedimentation, not sufficient to involve isostatic adjustment.

Kober explained mountain-making as an effect of comprehensive forces, which have their source in continued contraction of the earth. Adjustments have taken place by thrusting and folding in restricted zones, whereas the larger masses or plates of continental extent have behaved as rigid units. The zones of folding may receive an excess of material so as to be overloaded, when isostasy comes into play and the zones subside, possibly to an extent that brings them into the range of sedimentation. With a heavy accumulation of sediments, the isogeotherms eventually begin to rise, and the increase of temperature sets in play chemical reactions and causes expansion, thereby upsetting equilibrium, which leads to adjustment by folding or thrusting. Crustal movements, in the view of T. C. Chamberlin, have not effected widespread interchanges of land and sea. The continents and oceans are fixed in position, although migrations of shore-line have taken place frequently and are now in progress. Examples may be found of the engulfing of crustal blocks and folds, or of the upraising of the ocean floor into land, but they are isolated. The Antillean region, by its position between the two Americas and the two great ocean basins, has been particularly unstable, as instanced by the occurrence of deep-sea deposits on Barbados and other islands.

Metamorphism as an influence in the forma-

tion of mineral deposits is a subject to which practical students of geology have devoted much attention, with some important contributions to theory. One of the more significant results has been the broader recognition of the part played by igneous rocks in producing changes. Their field of operation, it is now regarded, may extend over such areas as are comparable to those of pressure or regional metamorphism, if, in fact, they have not been responsible for effects generally assigned in the past to the latter agency. Regions in which igneous rocks do not appear at the surface may still have been under their influence, for there is every reason to suppose that many deep-seated intrusions, like granite batholiths, are buried in the sedimentary layers out of sight. The heat, gases, and mineralizing solutions emanating from such bodies in the crystallizing stages would reach over extended zones, effecting those chemical and physical changes often ascribed to regional metamorphism. For the rôle of the igneous rocks in the formation of ores and valuable mineral deposits, see *Economic Geology*.

**Stratigraphic Geology.** The classification of the Pre-Cambrian formations in their order of sequence constitutes one of the outstanding problems of geology, about which a great deal of discussion has centred in late years, with many solutions proposed. Practically all students of the subject agree that the old idea of a dual division into Laurentian and Huronian or Archean and Algonkian, based on the thesis that there exists an earlier group of igneous rocks, chiefly granite, on which rests the altered sedimentary Algonkian or Huronian group, does not reflect the real conditions. Actually, the succession is much more complex than that, for sediments seem to have been laid down at recurrent intervals all through the Pre-Cambrian, and there are igneous formations of several different periods of intrusion. The sequence varies, also, between one region and another, and it is doubtful if any classification can be made, adapted to meet all conditions. The tendency now is to apply such methods and terminology as correspond best with the local features and not to attempt to correlate the formations of one area, like that of Lake Superior, for example, with the Pre-Cambrian of Great Britain or Scandinavia. For the arrangement given in the article *GEOLOGY*, in the second edition of the *New International Encyclopædia*, may be substituted the following scheme, which is fairly representative of the later research in the Pre-Cambrian areas of the eastern United States and Canada. The formations are named in the order of age, the oldest being at the bottom:

6. Keweenawan. Continental sediments and lavas.
5. Animikian. Marine sediments with important iron-bearing formations.
4. Huronian. Marine and continental beds.
3. Algoman. Later Laurentian granites.
2. Sudburyan. Marine deposits.
1. Archean, or basal complex. Includes Laurentian granites, Grenville schists and limestones, Keewatin iron formation and greenstones, and Couchiching schists. Sequence still undetermined.

There is evidence of widespread glacial climates during at least four periods; two of them occur in the Pre-Cambrian and two in later periods. In the lower part of the Huronian of



Canada are found slate conglomerates, which represent hardened boulder clays. In the later Pre-Cambrian, glacial conditions are indicated by the tillites of Norway and southern Australia. The Permian period contains evidences of extensive glaciation in the equatorial and south-temperate zones, notably in South Africa, Brazil, India, and other countries. The Pleistocene was the last of the great glacial periods. Changes of land surface are mainly responsible for the wide variations of climate; other causes are the variable supply of heat stored in the oceans and the fluctuating content of carbon dioxide in the atmosphere.

In many parts of America, the Cretaceous system shows no well-defined natural boundaries between the Jurassic system below and the Tertiary system above. It appears that no general unconformability reflecting a widespread earth movement exists at the close of the Jurassic, but sedimentation seems to have been continuous in one area or another. Thus, the Morrison formation of the Rocky Mountain region has been considered by some geologists to be of upper Jurassic age, by others, lower Cretaceous, and by still others, as containing members of each of the two systems. Correlation with the European Cretaceous is suggested by Osborn as the best method of settling the difficulty; he would place most value on the evidence of fossils. On the question of drawing a line between the Cretaceous and Tertiary systems, the consensus of opinion is to make the close of the Cretaceous coincident with the passing of the age of reptiles, indicated by the extinction of the great families of terrestrial dinosaurs. This view accords with the classification adopted by European geologists. As applied to the formations of the West, the plan is to draw the limits at the top of the Lance formation and to place the Puerco and Torrejon beds containing the remains of the oldest mammals in the Tertiary system.

**Structural Geology.** Can the varied elements of earth structure be fitted into a broad plan expressive of the origin and history of the separate features? This is the problem that underlies the more interesting or significant studies in the recent literature of structural geology, for which the notable contributions of Eduard Suess have been both incentive and guide. A later work is Kober's *Der Bau der Erde* (1921), which develops the theory that there are two fundamental units of crustal structure, great rigid plates serving as buttresses to movement and narrow elongated zones, separating the plates, of weak or labile nature. The latter serve for relief of deformative forces set up by the shrinkage of the crust; they define the position of geosynclines and of the great mountain systems, shifted somewhat in the course of geological time. Such zones, or orogens, are frequently defined by two parallel mountain systems with folds overturned away from each other toward the adjacent rigid plates. Between the parallel systems are broad intermontane regions of little folding. A cross-section of an orogen is more or less symmetrical, although each mountain system by itself has the asymmetrical structure so well described by Suess. The Pyrenees, Alps, Carpathians, Balkans, and Caucasus make up one parallel system, and the Apennines, Dinaric Alps, the Hellenic, Taurus, and Iranian mountains make up the other, the former overturned to the north and the latter to the south. Kober believes a similar orogen may be found

in the Rocky Mountains on the one side and the Sierras and Coast ranges on the other; also in the Andes as the eastern member of a zone of which the western part has foundered and disappeared in the Pacific. The existence of westward overfolding in the Appalachians is regarded as indicative of an eastern submerged member, now a part of the continental shelf.

Detailed studies of the structure and history of the Appalachian and Rocky Mountain systems were presented before the Geological Society of America (*Bulletin*, June, 1923). Although written for the specialist, the papers contain summaries of interest to the general student.

Observations in regard to the levels of marine beaches in northeastern North America have practically demonstrated a widespread uplift of the land surface since glacial time. Fairchild found that the rise between the St. Lawrence River and James Bay amounted to as much as 1000 feet. There has been a differential warping of the surface, the elevation increasing from south to north, with an up-arching into a dome south of James Bay. Raised beaches on the west coast of Greenland and in Ellesmere Land, according to Ekblaw, may be assigned to a similar uplift since the glacial period, the maximum being about 650 feet.

**Economic Geology.** This department felt the effects of intensive activities in nearly all its branches, mining geology, oil geology, and underground waters and engineering phases of geology. One of the economic sequels of the World War was an increased public and national interest in mineral resources, and there was a general stock-taking in these possessions all over the world. The control of the undeveloped oil fields became a matter of especial concern among the larger nations, with the realization that they were certain to play a considerable part in future commercial and naval operations. The location and development of petroleum fields had become almost a distinct department of geology, with its own technic and practitioners, who had extended their operations into the remote corners of the globe.

Out of the great volume of contributions on economic subjects, a few only may be selected for mention in this review. In the group of general works may be named the *Atlas of Economic Geology* (1921), published by the United States Geological Survey. It is a study of the geographic distribution of the valuable minerals and brings out clearly the political aspects of the world's supplies. It will be noted that the United States is well endowed in most of the basic materials such as coal, iron ore, copper, lead, zinc, and oil, but still has no adequate resources of potash or nitrate and is absolutely dependent on other countries for nickel, platinum, and tin, and largely for manganese. Great Britain with its colonies and its strong commercial position in other countries controls the precious metals and in the future is likely to dominate the oil situation. *Political and Commercial Geology and the World's Mineral Resources* (1920) is a compendium of statistics and special articles on the important minerals, by American writers. In the same category is a series of short monographs by various British authorities, on the mineral resources of the Empire, which have appeared from time to time.

In the list of textbooks for students, prominent place should be given to the translation

of Beyschlag, Krusch, and Vogt's comprehensive treatise, of which the English version, *The Deposits of the Useful Minerals and Rocks: Their Origin, Form, and Content* (1916), was made by Truscott. Leith's *Economic Aspects of Geology* (1921) and Emmons's *General Economic Geology* (1922) also were intended for students. Grabau's *Principles of Salt Deposits* (1920) was the most important contribution of recent date on the salines; potash, soda, and magnesia salts. Lindgren's *Mineral Deposits* appeared in a third edition (1928). Works on oil geology include *American Petroleum Industry* (1916) by Bacon and Hamor, *Geology of Petroleum*, by Emmons (1921), and *Practical Oil Geology*, by Hager (1916). Both of these cover such technical matters as mapping, drilling, and oil production, as well as the study of the occurrence and distribution of petroleum.

The control of geological structure on the accumulation of oil-pools has been worked out so completely that it is now a well-established principle, which is directing the search in all new fields. Less is known about the motive force that impels the oil in its travels underground. Some geologists have sought to explain this by capillary action, on the basis that water has a greater capillary force in small openings than oil has and consequently drives the latter ahead of it into the larger openings, which are found under domes. Other geologists have sought explanation in hydrostatic pressure and in gravity; in any event it is well known that in most accumulations underground waters have an important bearing on the localization of the oil. Another direction pursued by recent investigation is the relation between the character of oil and the degree of alteration or metamorphism of the enclosing rocks. Strata that have been much altered by compression or heat have lost their oil. An indication of the possibilities in this regard may be obtained, according to David White, by estimation of the fixed carbon ratios in the shale or coal that overlies the oil horizon; if the ratio exceeds 75 per cent of the total carbon, there is little likelihood of a productive pool. Formations with a relatively high fixed carbon yield oils of the lowest gravity and most commercial value. Formations with lignitic beds are characterized by the lowest grade oils of all. It would appear that as organic matter is altered into substances having progressively higher carbon, through the elimination of oxygen, nitrogen, and a portion of the carbon, the distillates in the rocks become progressively higher in hydrogen.

For the study of ore deposits, the most significant feature in the contributions of the last decade has been the general trend toward the igneous or magnetic theories of vein origin, as opposed to the explanation by meteoric (atmospheric) waters which once received wide acceptance. Although nearly all writers are agreed that the intrusive rocks have supplied the materials out of which veins were formed, there is not the same unanimity of opinion about the methods by which the minerals have been transported and finally arranged in the veins and lodes. It is recognized, however, that certain kinds of ores, magnetic, for example, may originate by direct cleavage or differentiation of the igneous rock during the crystallizing stage. These occur in their original environment.

On the other hand, many deposits, such as those of gold, silver, copper, lead, and zinc, are

often found at some distance from any intrusion that can be regarded as source and in formations distinctly older than the deposits themselves. For such, it is obvious that the ores must have been transported in fluid or molten condition out of the parent magma. The agency may have been highly heated waters and gases evolved by the intrusion in cooling, the fluids passing upward and outward from regions of high pressure to those of low pressure; this is the view commonly accepted. With the gradual cooling and relief of pressure of the mineralized solutions as they move away from their source, the dissolved substances are deposited in the reverse order of solubility, and there results a general zonal arrangement which is frequently illustrated by the change of the mineral contents of veins in passing downward from the surface or outward from the igneous mass. A more detailed presentation will be found in the textbooks on mineral deposits already enumerated, and in the work of Spurr, *The Ore Magmas* (1923). See PHYSICS.

**GEORGE V** (GEORGE FREDERICK ERNEST ALBERT) (1865- ). King of Great Britain, Ireland, and the British Dominions beyond the Seas, Emperor of India, (see Vol. IX). During the World War, King George set an inspiring example by cutting down his personal expenses and by contributing freely from his private purse to relief work. In 1917 he renounced all German titles. On Feb. 9, 1927, it was announced that his title had been changed to the above from "King of the United Kingdom of Great Britain and Ireland, etc." in conformity with the status of the Irish Free State. He was critically ill with pneumonia during the winter of 1928-29 and six Counselors of State, among them the Prince of Wales, were appointed to take over his duties. By the following June he was able to perform the more important of his functions. A biography *King George V*, by Sir George Arthur was published in 1929.

**GEORGE, GRACE** (1880- ). An American actress (see Vol. IX). She established the Playhouse Company in repertoire in 1915 and starred in *The New York Idea*. Her later starring vehicles included *Major Barbara*, *The Earth*, *Captain Brassbound's Conversion* (1915-16), *Eve's Daughter* (1917), *L'Élévation* (1917-18), *She Would and She Did* (1919), *Quick Work* (1919), *The Ruined Lady* (1920), *The New Morality* (1921), *Marie Antoinette*, *To Love, The Enchanted Hour*, *All Alone Susie*, and *The Road to Rome* (1928).

**GEORGE, STEFAN** (1868- ). Germany's foremost poet of the neoclassical school who opposed the rising naturalistic movement in his periodical *Blätter für die Kunst* (1900-1919). His verse is distinguished for exquisite imagery and musical rhythm. His works are *Die Fabeln*, *Hymnen* (1890), *Pilgerfahrten* (1891), *Algalal* (1892), *Das Jahr der Seele* (1897), *Der Teppich des Lebens* (1899), *Lieder von Traum und Tod* (1899), *Der sieben Ring* (1907), *Der Stern des Bundes* (1914), *Der Krieg* (1917), and *Drei Gesänge* (1921). He edited *Deutsche Dichtung*, the works of Jean Paul and Goethe, and *Das Jahrhundert Goethes*, and translated Dante, Baudelaire, Verlaine, Verhaeren, Mallarmé, Rimbaud, de Regnier, Swinburne, Dowson, Jacobson, Kloos, de Verweys, d'Annunzio, and others.

**GEORGETOWN UNIVERSITY**. A Roman Catholic institution for the higher education of men at Washington, D. C., founded in

1789. The student enrollment increased from 1533 in the autumn of 1913 to 2509 in the autumn of 1928, the faculty from 175 members to about 350. The library in the former year contained about 150,000 volumes, while in 1928 the Riggs Memorial Library contained 162,476 volumes, the Hirst Library, 9123, and libraries maintained by various departments and professional schools many additional volumes. Additions to the plant during the period under review included: A dormitory accommodating 244 students, completed in 1926; an addition to the University Hospital in 1927; and improvements on the campus during 1927-28. During 1916 the university inaugurated a new course in banking and finance; in 1920 a Morgan endowment of \$30,000 was received for the Department of American History and in the same year a foreign service school was formed; scholarships were established in this school for all Latin-American countries in 1922, and the policy of sending students from the school to foreign countries was continued, 40 such students being sent to Mexico in the summer of 1922. In 1920 a gift of \$40,000, for the Riggs Building of the Georgetown University Hospital, was received from Francis and T. Laureson Riggs. In 1922 the entrance requirements for the law school were changed to one year of college work beginning in 1923, and two years beginning in 1925. President, the Rev. W. Coleman Nevils, S.J., Ph.D., D.D.

#### GEORGE WASHINGTON UNIVERSITY.

A nonsectarian institution for the higher education of men and women, at Washington, D. C.; founded in 1821. The enrollment increased from 1347 in 1913 to 5308 in the autumn of 1928, and the faculty from 234 in 1916 to 346. The summer session of 1928 had a total enrollment of 1416. The productive funds were increased during the period under review from \$104,670 to \$1,060,546, from which the income in 1928 was \$42,417, and the total income from all sources was \$921,367. The University Library, including the law and medical school libraries, contained 80,000 volumes in 1928. Among the developments at the University between 1914 and 1928 were the purchase and equipment of a law school building in 1920; the acquisition of considerable real estate in 1921 through a bequest from Gen. Maxwell Van Zandt Woodhull; the establishment in 1918 of a fund for the education of Filipinos by Mrs. Larz Anderson; the completion in 1925 of Stockton Hall, a law building; the acquisition of a new administration building through purchase; and a gift of \$1,000,000 in 1927 from the Supreme Council of the Scottish Rite Masons, Southern Jurisdiction, to establish a school of government, which opened in the autumn of 1928 with general courses in government and a foreign-service course. William Mather Lewis, A.M., LL.D., who became president in 1923, was succeeded in 1927 by Cloyd Heck Marvin, Ph.D., LL.D.

**GEORGIA.** The twentieth State in size (59,265 square miles) and the twelfth in population; capital, Atlanta. The population increased from 2,609,121 in 1910 to 2,895,832 in 1920, a gain of 11 per cent; estimated population, 1928, 3,203,000. The white population rose from 1,431,802 (1910) to 1,689,114 (1920); Negro, from 1,176,987 to 1,206,365; native white, from 1,416,730 to 1,672,928; foreign-born, from 15,072 to 16,186. The urban population increased from

538,650 to 727,859; the rural, from 2,070,471 to 2,167,973. The growth of the principal cities was as follows: Atlanta (q.v.), from 154,839 to 200,616; Savannah, from 65,064 to 83,252; Macon, from 40,665 to 52,995; and Augusta, from 41,040 to 52,548.

**Agriculture.** Georgia, one of the leading cotton-producing States, suffered the ravages of the boll weevil, but eventually in great part checked them. The pest had practically covered the State by 1916. Its effect is indicated by a comparison of acreage and production for various years during this period: in 1913, 5,318,000 acres and 2,317,000 bales; in 1917, 5,195,000 and 1,884,000; in 1921, 4,172,000 and 787,000; 1928, 3,719,000 and 1,020,000. In the southern part of the State, the yield in 1922 reached a record low mark. See the articles COTTON, and ENTOMOLOGY, ECONOMIC.

The number of farms decreased by 16.7 per cent, from 310,732 in 1920 to 249,095 in 1925. In 1925 the total acreage of land in farms was 21,945,496, as compared with 25,441,061 in 1920. The improved land in farms fell from 13,055,209 acres in 1920 to 10,695,817 in 1925, while the total of land in farms declined from 67.7 per cent in 1920 to 58.4 per cent in 1925. The total value of farm property in the State showed an apparent increase, from \$580,546,381 in 1910 to \$1,356,685,196 in 1920, but fell to \$686,673,248 in 1925; and the average value of farm property in those years, respectively, was \$1995, \$4366, and \$2757. In interpreting these values, the inflation of currency incident to the War is to be taken into consideration. Of the farms in 1925, 88,680 were operated by their owners, as compared with 98,628 in 1910; 1407, by managers, as compared with 1410; 159,008, by tenants, as compared with 190,980. The white farmers in 1925 numbered 165,018, as compared with 168,468 in 1910; colored farmers, almost entirely Negroes, 84,077, as compared with 122,590. Farms reported as under mortgage in 1925 numbered 24,083, as against 23,135 in 1920, and 18,257 in 1910. The number of dairy cows was: (1910) 405,710; (1920) 484,122; and (1924) 257,151; "beef" cows, 245,303, 282,067, 272,487; mules, 294,985, 406,351, and 343,659; while sheep decreased from 153,250 to 72,173, and 50,503. The number of swine rose from 1,836,246 in 1910 to 2,178,914 in 1920 (this increased production of pork being typical of a change to more diversified farming), but declined to 1,299,711 in 1924. The estimated production of the chief farm crop in 1928 was as follows: Corn, 38,010,000 bushels; wheat, 1,034,000; oats, 5,300,000; potatoes, 1,682,000; sweet potatoes, 10,234,000, peaches, 10,000,000; tobacco, 84,387,000 pounds; and hay, 521,000 tons. Comparative figures for 1913 are corn, 63,023,000 bushels; wheat, 1,708,000; oats, 9,240,000; potatoes, 972,000; hay 350,000 tons; and tobacco, 1,800,000 pounds.

**Mining.** Georgia is not important as a mineral-producing State. It has but little metal mining, and of the non-metals, the most important are clay products, stone, fuller's earth, and cement. There is also produced a small quantity of coal, a considerable amount of bauxite, mineral waters, barite, manganese ores, some iron ore, and mica. The course of early output of the clay products and other minerals will be seen in the following figures. In 1914: clay products \$2,263,034; stone, \$2,238,780; coal, 166,498 tons. In 1917: clay products

\$2,426,671; stone, \$1,797,098; coal, 119,028 tons. In 1920: clay products, \$5,572,999; stone, \$3-651,415; coal, 50,156 tons. In 1926: clay products, \$5,957,486; stone, \$5,470,561; coal, 59,869 tons. The total value of the mineral production in 1926 was \$17,479,967; in 1925, \$16,503,741; in 1921, \$8,650,003; in 1920, \$12,178,695; and \$5,704,856 in 1914.

**Manufactures.** Georgia has shown a steady increase in the value of its industrial products in the recent census periods. In 1919, 12 cities of more than 10,000 inhabitants, forming 18 per cent of the total population reported 45.7 per cent of the value of the State's manufactured products. There were in the State, in 1909, 4792 manufacturing establishments; in 1919, 4803; in 1925, 2876; and in 1927, 3175. The persons engaged in manufactories numbered 118,036, 141,012, 141,173, and 154,168, respectively; and the capital invested amounted to \$202,777,665 (1909), \$448,700,194 (1919). The value of the products rose from \$202,863,262 in 1909 to \$693,237,007 in 1919; in 1925 it was \$648,852,294, and in 1927 \$609,917,660; the increase in 1919 was in great measure due to changes in industrial conditions brought about by the War. The increase shown in the average number of wage earners, however, indicates a considerable growth in the manufacturing activity of the State. The most important industry in the point of value of products is the manufacture of cotton goods, the value of which in 1909 was \$48,037,000; 1919, \$192,186,000; 1925, \$193,424,000 and in 1927, \$180,509,344. Cottonseed oil and cake rank high with products, valued at \$23,641,000 in 1909; \$99,320,000 in 1919; \$21,925,257 in 1925, and in 1928, \$27,998,981. Fertilizers amounted to \$16,800,000 in 1909; \$47,480,000 in 1919; \$28,201,583 in 1925, and 22,093,903 in 1927. Lumber and timber products rose to second rank; they were \$24,032,000 in 1909; \$43,066,000 in 1919; \$36,705,327 in 1925, and \$30,786,387 in 1927. There were 483 manufacturing establishments in Atlanta in 1909, 423, in 1914; and 429, in 1925; with products valued at \$33,038,000, \$41,279,000, and \$31,236,952, respectively. Savannah, ranking second in industrial importance, had 135 establishments in 1909, with products valued at \$6,540,000; in 1914, 128, with \$6,343,000; and in 1925, 101, with \$15,118,938. In Macon, there were 79 establishments in 1909, 70 in 1914, and 74 in 1925, with products valued at \$10,052,000, \$18,867,000, and \$29,478,220 in those years.

**Education.** The development of education in the State has been considerable in recent years. The Legislature of 1918 passed an act codifying the school laws of the State; providing for a State Superintendent of Schools, a State Board of Education, and a State Board for Vocational Education. Laws for the consolidation of schools were passed by a later Legislature. In 1920 enactments provided for the physical training of pupils and for compulsory school attendance; and in the same year Federal assistance to the States for vocational education was accepted. The Legislature of 1922 conferred on several counties authority to levy taxes for vocational purposes; it provided teachers of agriculture and home economics in vocational high schools. The total enrollment in the elementary and secondary schools of the State in 1925-26 was 689,230. Of this number, 448,137 were white pupils, and 241,093 were colored, out of a school-age (5 to 17 years) population

of 575,401 white and 424,868 colored. In that year, the total number in the primary and elementary grades was 623,684. The colored enrollment was proportionately greater in the elementary and lower in the high-school grades than the white; it was: elementary, 235,476; secondary, 5617. Of both white and colored, the enrollment was: elementary, 623,684; secondary, 65,546. In 1919-20 according to the census of the Bureau of Education, there were enrolled in the elementary and kindergarten schools 645,700; in the secondary schools, 45,128. The percentage of illiteracy in the State decreased from 24.1 in 1910 to 18.4 in 1920; among the native white population, from 9.2 per cent to 6.7; among the foreign-born whites, from 5.9 to 5.6; among the colored, from 43.8 to 35.8.

**Finance.** State expenditures in the year ending Dec. 31, 1927, as reported by the U. S. Department of Commerce, were: for maintenance and operation of governmental departments, \$19,859,437 (of which \$8,191,503 was aid to local education); for interest on debt, \$308,832; for conducting public-service enterprises, \$6321; for permanent improvements, \$13,255,537; total, \$33,430,127 (of which \$15,138,307 was for highways, \$2,365,501 being for maintenance and 12,772,806 for construction). Revenues were \$20,262,206. Of this, the property and special taxes provided 24.3 per cent; departmental earnings and charges for officials' services, 8.1 per cent; sales of licenses and a tax on gasoline, 42 per cent. Property valuation was \$1,275,197,929; State taxation thereon, \$6,375,990. Net State debt was \$9,240,316.

**Political and Other Events.** Georgia remained strongly Democratic in politics even in 1928. In 1914, following the death of Senator Bacon, William S. West was appointed to serve out the unexpired term. It was necessary to elect two senators in 1914. Senator Smith was reelected and Thomas W. Hardwick was elected to fill the term of Senator Bacon. Nathaniel E. Harris was elected governor. Leo M. Frank, a manufacturer, was convicted in 1914 of the murder of a young girl in Atlanta. He was sentenced to be hanged on June 22; on appeal, the United States Supreme Court, refused to interfere. Petitions were circulated throughout the State and other parts of the country for commutation of sentence. The State Prison Commission declined to recommend the commutation of the death sentence. Nevertheless, Governor Slaton commuted Frank's sentence to life imprisonment. For several days, the governor's home was threatened by mobs. On June 20, he retired from office and was succeeded by Nathaniel E. Harris. On August 16, Frank was seized in prison by a band of men, carried to an isolated spot, and hanged. The Grand Jury carried on investigations, but no clew to the instigators of the deed was found. In 1916 Hugh M. Dorsey, who had acted as prosecutor in the case of Leo M. Frank, was elected governor. In the presidential election, Wilson received 125,831 votes and Hughes, 11,225 votes. The prohibition laws of the State were upheld by the court on Jan. 12, 1916, and went into effect. On Mar. 22, 1916, a serious fire swept over a large area in Augusta and destroyed many business blocks and residences. The loss was over \$5,000,000. In 1917 an investigation of the lynching evil was carried on by a commission appointed by the governor. The report of the commission declared that the number of lynch-

ings in the State was grossly exaggerated. On Mar. 21, 1917, a disastrous fire in Atlanta destroyed a considerable portion of the city and caused a property loss of about \$5,500,000. Senator Hardwick was defeated for renomination in 1918 by William J. Harris, who was elected. In the presidential voting of 1920, Cox received 107,162 votes and Harding, 42,730. In 1920 Hardwick was elected governor. In 1922 Governor Hardwick was defeated for the renomination by Clifford L. Walker, who was elected. On Oct. 3, 1922, Mrs. W. H. Felton was appointed United States senator to succeed Thomas E. Watson, deceased. She was the first woman to hold such a position. The appointment was honorary, as the election was held for senator within a few days, and Walter F. George, former judge of the State Supreme Court, was elected. For president in 1924, the vote of the state was: Davis (Democratic), 123,200; Coolidge (Republican), 30,300. L. G. Hardman was elected governor, 1926 and 1928. The presidential vote of Georgia in 1928 was: Smith (Democratic), 129,602; Hoover, (Republican), 99,369.

**Legislation.** In 1918 the Legislature of June 26 ratified the Federal Prohibition Amendment, authorized the codification of school laws, provided a budget system, and passed measures providing for aid to returned soldiers. Departments of warehouses and archives and history were created. In 1922 the Legislature amended the motor-vehicle law, increased the tax on gasoline to \$0.03, created a committee to consider tax measures, and amended the school laws to provide for Bible reading in the schools. A racial integrity act, for the recording of inhabitants' racial descent, as a means to prevent inter-racial marriages, was passed in 1927.

#### GEORGIA SCHOOL OF TECHNOLOGY.

An institution for the scientific and technical education of men founded in 1888 at Atlanta, Ga. The enrollment of the school increased from 1002 in 1914 to 2144 in 1928-29, in addition to which there was an enrollment of 544 in the 1928 summer session. The faculty increased from 62 to 157 members, and the library from 13,000 to 23,000 volumes. The endowment in 1928 amounted to \$200,000 and the income from appropriations and fees to \$553,000. A power station and engineering laboratory, and an addition to the mechanical engineering building were built in 1920; a building for the departments of physics and architecture was completed in 1923; a new structure to house the department of ceramics was completed in 1924; a \$100,000 addition to the chemistry building and Julius Brown Memorial Hall, a dormitory, were constructed in 1925, and in 1926 another dormitory, N. E. Harris Hall. Other developments during the period under review included a campaign in 1922 which netted over \$1,000,000 for the improvement of the school plant, and in 1924 the addition of a four-year course in ceramics engineering leading to the degree of bachelor of science. Marion Luther Brittain, LL.D., succeeded K. G. Matheson, LL.D., as president in 1922.

#### GEORGIA, SOCIALIST SOVIET REPUBLIC OF.

One of the three autonomous Transcaucasian republics that emerged in 1917. It is made up of the former Russian governments of Tiflis and Kutais and the districts of Batum and Artuin. Its boundaries enclose an area of 26,381 square miles; its population in 1926 was put at 2,660,963. The people are largely Christians and

belong to a distinct racial group called Georgian. The existence of this racial consciousness together with remnants of a certain political solidarity, whose inspiration centred in an eighteenth-century Georgian kingdom, made for an advanced cultural outlook. Georgians, speaking a common language and possessing a tradition, looked down on the Armenian traders of the towns and the unruly Tatar mountaineers to the north. The capital, Tiflis, has a population of 292,973 (1926). Other cities are Kutais Sukhum, and Batum. A university with six faculties was founded at Tiflis in 1918 and in 1926 had 1600 students.

**Industry and Trade.** Agriculture engages the attention of 90 per cent of the population, most of whom were a small peasantry as a result of the partition of the large estates. Corn is the most important crop, though other grains receive attention. Cotton, silk, tobacco, the vine, and fruits are other agricultural products. Because of the primitive means of tillage, the agricultural possibilities of the country are scarcely touched. After the Russian Revolution, the disorganized life of the country led to a great dearth of foodstuffs, so that in 1920 the estimated deficit was placed at 21,700,000 poods in Tiflis and Kutais alone. Its economic wealth, however, was established in its mineral deposits. The greatest manganese deposits in the world, producing 44 per cent of the world's supply in 1913, were to be found at Chiaturi in the basin of the Kuiril River. Production, which had been about 66,000,000 poods annually before the War, fell to 3,300,000 in 1919, but rose to 35,000,000 in 1927. Other minerals are naphtha, copper ore, coal, lead, and iron ore. It is estimated that the country has available for use in industry 4,000,000 horse power in its rivers. All the basic industries were nationalized by the Soviet régime and the following were used for purposes of exchange in foreign markets: manganese, timber, tobacco, silk, and copper. There are 570 miles of railways. A through line, extending across the country, connects Batum and Poti on the Black Sea with Baku on the Caspian Sea, by way of Tiflis. Branch lines ran to the coal mines of Tkhibuli, the manganese mines of Chiaturi, the mineral springs of Borjom, as well as to Signakh, Telavi, and the Armenian frontier. By way of Batum, communication is possible with the whole Caspian country, as well as Asia Minor and Central Asia. A pipe line connecting Batum with Baku brings Europe into contact with the rich oil fields of Azerbaijan.

**History.** After the Russian Revolution, representatives of the three Transcaucasian states gathered at Tiflis, Georgia, and there on Sept. 20, 1917, founded the federal republic of Transcaucasia. It was inevitable, however, that the three states should go their separate ways. Georgia's attempt to rule the destinies of the new state, Azerbaijan's essentially Islamic outlook, and Erivan's territorial ambitions, were the rocks on which the federal republic foundered. On May 26, 1918, with the Bolsheviks in Baku and the Turks in Batum, as a result of the Brest-Litovsk Treaty, the federal republic was dissolved. On the same day, the Georgian National Council proclaimed the independence of Georgia. Thenceforth, to the conclusion of the War, Georgia, because of a compact made with Germany, remained a dependency of the Central Powers, with its ports, mines, and rail-



ways in the possession of German and Turkish forces. By the Armistice of October 30, the country was cleared of German and Turkish troops, only to find itself policed by British. A British force entered Batumi in December, and for presumably strategic reasons, seized the railways of the country. Control was not relinquished, and evacuation did not come until the summer of 1920.

From 1920 until 1922, affairs never remained peaceful for long. In 1919 Georgians had been menaced by General Denikin's forces; but with the passing of this peril, in the spring of 1920, a Russian Soviet army pushed its way into Transcaucasia. Baku fell and Tiflis must have yielded too, had it not been for the distraction which the opening of the Polish campaign afforded. Russia for the time granted Georgia peace, even promising the Batumi region despite the claims of the Turkish Nationalists. But the necessity for a Turco-Russian understanding with respect to a common frontier again made the region the scene of military operations late in 1920. The Turks invaded Erivan and with much bloodshed subdued the population. The Bolsheviks, following soon after, overthrew the republican government and established a Soviet republic. The procedure in Georgia was very much the same. A Turkish army entered the country and occupied Batumi against practically no resistance, while Russian Troops invaded from the opposite direction and fostered Bolshevik uprisings in the towns. On Jan. 27, 1921, Georgia received belated *de jure* recognition from the Allies. In the course of a few months, however, the Constituent Assembly was dispersed, the Social Democratic government headed by Jordania was in flight; and supported by Russian arms, a Soviet government, established by Mdivani in March, ruled the country. Batumi was restored to Georgia by a Russo-Turkish treaty in March, 1921. In December, 1921, the young republic was incorporated with the Armenian and Azerbaijan Soviet republics into a Transcaucasian federation, with its capital at Tiflis, with Tiflis taking orders from Moscow. Thus by the end of 1921, Russia again dominated the political and economic life of her old Transcaucasian governments. This state of affairs received full legal sanction in the Treaty of Dec. 30, 1922, which was signed by Russia, the Ukraine, the three Transcaucasian Soviet republics, Bokhara and Khiva, and which set up the Union of Socialist Soviet Republics. With the treaty's promulgation, Georgia's history as an independent political state ended. See AZERBAIJAN, ARMENIA, RUSSIA.

**GEORGIA, UNIVERSITY OF.** A State co-educational institution at Athens, Ga., founded in 1785. The student enrollment increased from 632 in 1914 to 1736 in the autumn of 1928, with an additional registration of 2667 in the summer session of the later year, and the faculty in 1928-29 numbered 102 members. The endowment amounted to \$425,000 in 1928 and the income for the year from State and other sources was \$400,000. During the period from 1914 to 1924 about \$400,000 was spent on the erection of new buildings and the alumni subscribed more than \$1,000,000 for endowment and the building programme; in 1924 Memorial Hall, erected in memory of those alumni who fell and those who served in the World War, and a dormitory for men, were added to the plant of

the university; an athletics building was completed in 1926; and a commerce and journalism building in 1928. President, Charles M. Snelling, Sc.D.

**GÉRALDY, zhér-ôl'dé, PAUL** (1885- ). A French poet and playwright, most of whose plays were produced by the Comédie Française. His plays include *Les Spectateurs* (1906); *Le Préluce*; *Les nocces d'argent* (1917), played in New York as *The Nest* (1922); *Aimer* (1921), also given in New York in 1922 (*To Love*); *Les grands garçons* (1922), and *Robert et Marianne* (1926). He also wrote *Toi et Moi*, a very popular book of poems, and *Le grand-père*, a poem about Joffre and the World War (1915).

**GERARD, JAMES WATSON** (1867- ). An American lawyer and diplomat (see VOL. IX). In 1917, on the declaration of war against Germany by the United States, he was recalled from his post of Minister at Berlin and took up the practice of law in New York City. He published *My Four Years in Germany* (1917) and *Face to Face with Kaiserism* (1918).

**GÉRARD, ROSEMONDE.** See ROSTAND, ROSEMONDE GÉRARD.

**GERMAN EAST AFRICA.** See TANGANYIKA TERRITORY.

**GERMAN LITERATURE.** The Armistice of 1918, which put an end to the bloodiest war in the history of mankind, was the prelude to a drama of political reconstruction which not only changed the map of Europe but led to the removal of social barriers and was accompanied by economic upheaval. The reaction upon the minds of the people directly concerned in this revolution was profound. In Central Europe the awakening from a dream of victory, conquest, and world power produced a state of mind not unlike what in the vernacular of those countries is called a "Katzenjammer." The youth that had gone through the purgatory of the War discarded old ethical ideals, scorned the æsthetic canons of the past and demanded a new social code and a new art. Frantically groping in the chaos of inchoate ideas for something strong and tangible, the young poets rushed into verse and stammered sibylline cryptic lines which to the uninitiated were little more than "words." The past had become a nightmare from which they madly hurried to escape by welcoming anything radically different. The condition was not limited to Germany and Austria; France was no little affected by this current of thought and even America was not spared this aftermath of the War in literature and on the stage.

Most interesting was this reaction in the work of the foremost writers of the period. Gerhart Hauptmann, poet, dramatist, and novelist, since over a quarter of a century considered the most dominant literary personality of his country, turned from the factual present to an imaginary Utopia in *Die Insel der grossen Mutter oder Das Wunder von Ile des Dames*. Then, he delved into German lore and cast the dramatic story of Wieland der Schmied into the form of a modern tragedy: *Veland*. A play in his earlier naturalistic style followed: *Dorothea Angermann*. In the mean time, he had worked upon what was to be the chief work of his life: *Till Eulenspiegel*, an epic poem, in which he invested with the spirit of the mediæval German hero a former aviator ace in the German Army, who had turned tramp, showman, magician, and commentator upon the life about him. His adventures, visions, and dreams presented as in his

magic mirror a picture of the post-war period, overcrowded at times with current events but powerful in its suggestion. After that work, he returned once more to his earliest manner in the novel *Wanda*.

While German drama and poetry groaned under the weight of the new ideas, fiction escaped comparatively lightly. Hermann Sudermann, who forty years before had been hailed as one of the protagonists of a new critical attitude toward antiquated social conventions, but had been promptly dropped by the young generation that forged ahead of him, remained popular and in *Der tolle Professor* presented a powerful picture of the Bismarck period. Thomas Mann, the Hanseatic patrician among German writers, after some contributions to war literature paid tribute to the new pseudo-art in the story *Kino*, to the pathological trend in *Der Zauberberg*, *The Magic Mountain*, a novel about consumptives in a sanitarium, and to the interest in criminal types in *Der Hochstapler Felix Krull*. Heinrich Mann, his brother, who had maintained a rather independent attitude during the War, startled his readers by the novel, *Der Kopf*, which voiced a protest against the modern hypertrophy of the brain, in *Mutter Marie* told a highly emotional story of a segment of Berlin post-war society, and in *Eugenie oder die Bürgerzeit* gave other evidence of his insight into human souls. Jacob Wassermann's *Fabian oder die verlorenen Jahre*, *Landin und die Seinen*, and *Der Aufruhr um den Junker Ernst* were followed by a novel which challenged German law and judicial practice, *Der Fall Mauritzius*, and like most of his recent works was translated into English.

Among the younger men who first appeared during the War, the most interesting figure is Franz Werfel. Poet, dramatist, and novelist, he made his debut with a slim volume of verse of strong individuality, and attracted attention by a novel with the startling title, *Nicht der Mörder, der Ermordete ist schuldig* and has continued to cultivate a pathological tendency in stories such as *Der Tod des Kleinbürgers*, *Geheimnis eines Menschen*, and the story of a youth, *Der Abituriententag (Graduation Day)*, which is one of the strongest among the many stories of adolescence now being written in Germany. Frank Thiess seems exclusively to cultivate that theme, his *Thor des Lebens* and *Abschied vom Paradiese* being followed by *Narren*. While these novels deal mainly with the problems besetting the life of young men, there has been no lack of fiction about the adolescent woman, a notable example of which is Gabriele Reuter's *Töchter*. Clara Viebig, the most popular woman novelist of Germany, is the author of a school-teacher's novel, *Die mit den tausend Kindern*. Arnold Zweig's *Sergeant Grischa* inaugurated a flood of war fiction, widely varying in merit, but amazingly popular with American readers. Outstanding among these novels is Erich Maria Remarque's *Nichts Neues im Westen*, which was recently followed by Ludwig Renn's *Krieg*.

**German Drama.** This department of literature is still in the throes of a transition which may eventually bring forth a work of lasting value. The German stage—like the American—seems one vast laboratory, in which every writer experimenting with innovations may have his try-out. The much discussed protagonist of expressionism, Georg Kaiser, has since his excursion

into birth-control and Malthusianism in *Gats*, produced nothing to equal the success of his earlier works. Franz Werfel, by far the most talented of his generation, wrote, after his *Juarez und Maximilian* known in New York through the Theatre Guild, a dramatic legend, *Paulus unter den Juden*. Ernst Toller, who in his *Masse Mensch* seemed to open new vistas, has not kept the promise in his later works, among them *Hopl wir leben*, in which a man sentenced to death for revolutionary activity, is unexpectedly pardoned and becomes insane, *Der entfesselte Wotan* and the marionette play, *Die Rache des verhöhlten Liebhabers*. Fritz von Unruh's *Bonaparte*, recently translated into English, and his *Heinrich von Odenbach* did not have the stage success as did some of his earlier plays. Interesting experiments by newcomers were Franz Theodor Czukor's *Die Stunde des Absterbens*, Hanns Johst's semi-historical *Thomas Paine*, Bruno Franck's *10,000* which made his admirers compare him with Schiller, Ernst Lisauer's first dramatic attempt: *Das Weib des Jephtha*, which was warmly received, Rudolph Lauckner's *Kristis*, which cleverly presents an individual marriage crisis against the background of a world crisis, Rudolf Fitzek's *Menschen des Untergangs*, a tragedy of defection and Paul Kalbeck's *Wir sagen uns Alles!*, an excellent comedy. Max Mell stands apart from all others by his religious dramas. Bernt Brecht's *Im Dickicht der Städte*, a lurid play of Chicago's slums and vice dens may be true to life, but, like his other works, is hardly true to art.

Among the older playwrights, Ludwig Fulda burlesqued movie plays in his *Film-Romantik*; Wilhelm Schmidthorn presented *Der Pfarrer von Mainz*; Fritz Philippi, a penitentiary play, *Der Paragraphenteufel*; Hermann Bahr, a farce, *Altweibersommer*; Arthur Schnitzler, a poetic drama, *Der Gang zum Weiher*; and Hugo von Hofmannsthal, *Der Turm*. Karl Schönherr, the Austrian people's playwright, revived echoes of the War in *Die Hungerblockade* and *Der Armen-doktor*. Carl Sternheim wrote the play, *Oscar Wilde*; Alfred G. Nagel one on Strindberg, *Charfreitag*; and Bernhard Kellermann presented a dramatic picture of the Anabaptists, *Die Wiedertäufer von Münster*.

In recent poetry, the older poets reflected little of the new spirit seething in the younger generation. Heinrich Vierordt showed Persian influence in his *Garten der Ghasele*; Alfred Kerr's *Capriccios* reflected his whimsical humor; Christian Morgenstern covered the period 1887-1914 in *Mensch-Wanderer*; Alfons Parquet drew upon impressions of travel in *Amerika* and Hans Brandenburg published a book of poems, *Sonette*. The Swiss poets were little affected by the trend of the time, but Jacob Schaffner's *Der Kreislauf*, and especially Robert Faesi's *Der brennende Busch*, have a certain strength and warmth. Among the women, Isolde Kurz, always an interesting figure, added to her previous poetical works two poems on love and death: *Der Ruf des Pan*.

Among the newcomers, Johann Brecher has been the most widely discussed. A true product of the revolutionary spirit of the period, his poem, *Der Leichnam auf dem Throne*, was suppressed and even the recitation of extracts was penalized. His *Maschinenrhythmus* vibrates with the pulse of our mechanistic time. Others cling to the old forms, as did Josef Ponten, whose *Römiches Idyll*, a lyric epic, has a rare

distinction; Alfred Doeblin's *Manassis* also merits respect. Ina Seidel is of the new generation, though her *Gedichte* differ little in form and spirit from those of her poetical ancestors.

As the German people adjusted their life to the new regime, the scholars resumed their task of collecting, compiling, and classifying documents and data, and the works of history, biography, literature, and criticism are as numerous as ever. Albert Soergel brought down his monumental history of contemporary German literature to date by the volume, *Im Banne des Expressionismus*, since succeeded by another, covering the last decade. Oscar Walzel's *Deutsche Dichtung der Gegenwart* and Friedrich von der Leyen's *Geschichte der deutschen Literatur* are ably supplemented by Emil Ermatinger's *Deutsche Lyrik seit Herder und Krisen und Probleme der neuen deutschen Dichtung*, and Walter Rehm's *Geschichte des deutschen Romans*. Hermann Köster's *Geschichte der deutschen Jugendliteratur* is proof of the new interest in the intellectual development of youth. Heinrich Spiro's *Die Heilandsgestalt in der deutschen Dichtung* is an interesting study. Goethe literature was enriched by Walter Jablonsky's *Vom Sinne der Goethe'schen Naturforschung*, Heine received a unique tribute in H. W. Houben's *Gespräche mit Heine*. Carl Bleibtreu wrote *Geschichte der englischen Literatur*.

Since psychoanalysis entered literature some years ago in the *Tragische Motive* of Fritz Wittels, not a few studies of writers and their works show the influence of Freud and his disciples. Alfred Winderstein's *Der Ursprung der Tragödie* contains the results of his psychoanalytic study of Greek drama. The number of books in which psychological analysis of a character dominates the biographical material is multiplying, and there have been produced some very interesting works, foremost among them Stefan Zweig's three-volume attempt at a "typology of the mind" under the collective title *Baumeister der Welt*. The first volume presented Balzac, Dickens and Dostoevski who "in the cosmos of their novels set a second reality beside the one already existing"; the second showed Hölderlin, Kleist, and Nietzsche driven by a demonic power beyond themselves and reality toward the infinite; and the third, entitled *Drei Dichter ihres Lebens*, treated Casanova, Stendhal, and Tolstoy as three manifestations of the same creative function, self-reflection, Casanova being the purely material and naïve, Stendhal the psychological, analytical, and Tolstoy the religious and ethical. Ernst Heilborn's study of that most fascinating embodiment of versatility, *Ernst Theodor Hofmann*, Anton Bettelheim's *Balzac*, Julius Bah's *Shaw*, Julius Meyer Graefe's *Dostojewsky*, Dr. Harry Mayne's *Conrad Ferdinand Meyer*, Otto Strohl's *Richard Wagner*, partake of this subtle quality which differentiates them from mere "lives."

Memories of a man who mystified and agitated German readers some thirty-five years ago were revived by the appearance of the first biography of *Julius Langbehn* by the only man who knew him intimately, Benedikt Momme Nissen, followed by Cornelius Gurlitt's *Langbehn, der Rembrandt-deutsche*. Emil Felden's *Eines Menschen Weg*, dealing with the life of Ebert, recalled the first stormy days of the German Republic. Interest in the great spiritual teachers is evident in Georg Ellinger's book on the Silesian mystic, *Angelus Silesius* and in Christoph Schrempf's

life of the Danish philosopher, *Søren Kierkegaard*. The scholarly Emil Lucka delved into the history of the Spanish Inquisition in his *Torquemada*. Dr. Karl Federn, the prolific writer of biographical and critical studies, wrote *Richelieu*. Stefan Zweig is the author of a most sympathetic study of the tragic life of the French poetess, *Marcelline Desbordes-Valmore*. Upon René Fülöp-Miller's *Lenin and Gandhi* followed his *Dostojewsky, Tolstoy, and Rasputin*. Among other Tolstoy lives, that of Witkop stands out. Georg Hirschfeld, poet and novelist, presented another life, *Lord Byron*. The tragic history of *Charlotte von Mexiko* was retold by Curt Elwenspoek.

The new books by Emil Ludwig on *Bismarck*, *Goethe*, and *Napoleon*, based on his earlier works on those subjects, are those of an able journalist rather than serious biographer, and their success in America surprised German critics. His latest work is *Der Menschensohn—The Son of Man*. Contributions to the biography of contemporary German literature are Arthur Kutschner's *Frank Wedekind*, Hugo Ball's *Hermann Hesse*, and Willibald Kohler's *Hermann Stehr*. Autobiographical are Hermann Bahr's *Die Liebe der Lebenden*, O. A. K. Schmitz's *Der Meister des Hauses*, and *Damon Welt* and Ernst Toller's *Justiz*.

Letters have appeared in great numbers. Close upon the fascinating book of Alfons Mathes on *Frau Aja*, Goethe's mother, followed Fritz Bergemann's *Bettina's Leben und Correspondenz mit Goethe*, and Flodoard von Biedermann's *Correspondenz Joseph Unger's mit Goethe*. Ernst Haackel's *Himmelhoch jauchzend*, edited by his friend Heinrich Schmidt, offered an intimate picture of the great scientist's emotional life. Even more interesting were new letters in *Hans von Bülow*, among them those addressed to Cosima before and after the separation, and many to his daughter Daniela, which bring out the nobility of his character. *Am Anfang war die Liebe* is the title of letters of Malvida von Meysenbug, author of the *Memoiren einer Idealistin*, to Mme Monod, daughter of the Russian revolutionist of 1848, Alexander Herzen, and widow of the French historian Gabriel Monod. New letters in *Ferdinand Lassalle* cover his period of labor propaganda. The correspondence of the historian in *Niebuhr* and that in *Varnhagen von Ense* are of interest to special students, while that in *Walter Rathenau* is valuable as commentary upon recent history.

The flood of books dealing with the War was slow in subsiding. Among them are Carl Bleibtreu's *Geschichte des Weltkriegs*, Hans Delbrück's *Vor und nach dem Weltkrieg*, Hermann Oncken's *Die Rheinpolitik Napoleons III. und der Ursprung des Weltkriegs*, Ludendorff's *Die Schuld der überstaatlichen Mächte am Zusammenbruch*, Erich Brandenburg's *Von Bismarck zum Weltkrieg*, Maximilian Harden's *Von Versailles zu Versailles*, Wahl's *Von der Reichsgründung bis zum Weltkrieg*, Herre's *Weltgeschichte der neuesten Zeit*, Hammann's *Deutsche Weltpolitik*, Walter Rathenau's *Gesammelte Schriften und Reden*, and many others. Nevertheless, German scholars soon turned to the past and delved with gusto in its archives. Hans von Helmholtz's *Friedrich der Grosse und sein Preussen* stimulated interest in the history of his period. Upon Friedrich Kircheisen's *Napoleon in Ägypten* followed his two volume biography: *Napoleon*, his

*Memoiren, Lord Nelson, Die Bastille, and Die grosse französische Revolution.* Ricarda Huch's *Freiherr von Stein* portrayed a commanding figure among Prussian diplomats of the Napoleonic period. Professor Troeltsch's *Deutscher Geist in West-Europa and Geistesgeschichte und Religionssoziologie*, followed *Die Bedeutung des Protestantismus für die Entstehung der modernen Welt*. An interesting attempt at correlating folklore and history was made by Heinz Hungerland in *Die Volkskunde eine Hilfswissenschaft der Geschichte—ihr Wesen und ihre Erziehungswerte*. Ricarda Huch returned to her special field, Italy, in her book on *Garibaldi*. Dombrowski, a young writer of Polish descent, attracted attention by his *Köpfe der Gegenwart und Neue Köpfe*.

That the philosophers of the country should join in the interpretation and explanation of Germany's war policy was to be expected. Bruno Bauch's *Fichte und der deutsche Staatsgedanke, Die Idee, and Der Geist von Potsdam und von Weimar* follow that trend of thought. But the number of works that do not refer to the political upheaval of the past years is far greater. Among them are H. A. Dingler's *Der Zusammenbruch der Wissenschaft und der Primat der Philosophie*, Ernst Cassirer's *Individuum und Kosmos in der Philosophie der Renaissance*, Johannes Volkelt's *Phänomenologie und Metaphysik der Zeit*, Müller-Freienfels's *Metaphysik des Irrationalismus*, and H. A. Driesch, whose *Orisis in Psychology and The Possibilities of Metaphysics* were published in English. Müller Freienfels also wrote *Erziehung zur Kunst und Die Seele des Alltags* and Ernst Cassirer: *Sprache und Mythos*. Wilhelm Bölsche, that unique interpreter of nature who combines the scientist's knowledge with a poet-philosopher's vision, has given us *Von Drachen und Zauberkünsten, Im Bernsteinwald, Lichtglaube, and Die Abstammung der Kunst*.

Hermann A. Keyserling's symposium on marriage, *Das Ehebuch, and Die neuentstehende Welt*, like some earlier works have become popular in English translations; his latest work is *Menschen als Sinnbilder*. Rudolf Steiner, the founder of anthroposophy, left some posthumously published works, among them: *Friedrich Nietzsche, ein Kämpfer gegen seine Zeit, and Goethe's Geistesart in ihrer Offenbarung durch seinen Faust und durch das Märchen von der Schlange und der Lilie*. A most valuable addition to Nietzsche literature is *Nietzsche und sein Werk*, by Elisabeth Förster-Nietzsche and Henri Lichtenberger. Dr. Karl Joel's *Wandlungen der Weltanschauung*, Dr. Karl Federn's *Das ästhetische Problem*, and Wilhelm Giese's *Psychotechnik*, deserve mention. Among the works on political economy which have multiplied amazingly are Lujo Brentano's *Konkrete Grundbedingungen der Volkswirtschaft*, Georg Max Jahn's *Sozialpolitik und Studienplan der Nationalökonomie*, and Sartorius von Waltershausen's *Die Weltwirtschaft und das staatlich geordnete Verkehrswesen, and Weltwirtschaft und Weltanschauung*.

Innumerable books of essays on various subjects have come from the printing presses of the country. Among them are Hans Brandenburg's *Vom schaffenden Leben und Das neue Theater*, Max von Boehn's *Empire, Wallenstein, and Polizei und Mode*, Eugen Kalkschmidt's *Das alte Dresden*, S. Perzynski's *Japanische Masken*, Alexander von Gleichen-Russwurm's *Von Art und*

*Unart—ein Zeitspiegel des guten Tons, Dix's Gemütsleben in der frühen Kindheit and Die Reifezeit, Arthur Schurig's Kleiner Katechismus der Lebenskunst, Alfred Kerr's Es sei wie es wolle, es war doch so schön, etc.* Books on religious problems came from Deissmann, *De Profundis*; Martin Dibelius, *Geschichte der übergeschichtlichen Religionen im Christentum und Geschichte der urschriftlichen Literatur*; Dr. Joseph Engert's *Studien zur theologischen Erkenntnislehre and Das neue Leben*, and Carl Stange's, *Unser Glaube und Dogmatik*.

A redeeming result of the War is the fact that it brought America into closer literary relations with Germany. Works of fiction, drama, biography, and philosophy have been published in translations of varying merit and are likely to promote not only interest in German literature but assist in the understanding of the German mind. Among them are novels by Jacob Wassermann, Thomas Mann, Arnold Zweig, Franz Werfel and Arthur Schnitzler, whose plays were already known to the American stage, as well as the works of those radical newcomers, Ernst Toller and Franz Werfel, biographies by Emil Ludwig and René Fulop-Miller, the philosophical works of Count Hermann A. Keyserling, books by Felix Salten, Woldemar Bonsels, etc.

**GERMAN NEW GUINEA.** A former territory of the German Empire in the western Pacific. It fell to Australian troops on Sept. 12, 1914. The Treaty of Versailles partitioned the islands of the territory as follows: those north of the equator, the Caroline, Marshall, Pelew, and Ladrone Islands, with the exception of Guam, to Japan under mandate; those south of the equator, the Bismarck Archipelago, the German Solomon Islands, and Kaiser Wilhelmsland (on New Guinea) to Australia; and German Samoa to New Zealand. See PACIFIC OCEAN ISLANDS and NEW GUINEA.

**GERMAN SOUTHWEST AFRICA.** Formerly the oldest German colony in Africa, but since 1920 a British mandate territory, administered under the name of the Southwest Africa Protectorate, by the Union of South Africa. Under General Botha, leader of the Union of South Africa forces, the German administration was compelled to flee the country, so that by July, 1915, the British occupation was complete. Germany renounced her sovereignty in the Treaty of Versailles with the result that in May, 1919, the Supreme Council assigned the territory under a mandate to the Union. On Dec. 17, 1920, the League Council approved the transfer. See WORLD WAR, and SOUTHWEST AFRICA PROTECTORATE.

**GERMANY.** A federal republic organized under the constitution of Aug. 11, 1919, embracing territory in Central Europe between France, Belgium, and Holland on the west, and Poland on the east. The Treaty of Versailles redefined Germany's territorial limits and assigned the provinces of Alsace and Lorraine to France, a small district comprising the towns of Eupen and Malmédy to Belgium, North Schleswig to Denmark, and a large block of territory to Poland, including parts of East and of West Prussia which were made into the Danzig corridor, and some parts of the territory of Upper Silesia, which were ceded to Poland in accordance with the decisions of a committee appointed by the League of Nations after a plebiscite held in the district in 1922. The Saar Basin was handed over to the administration of a commis-

sion appointed by the League of Nations, and a plebiscite to be held at the end of 15 years was provided for to decide the sovereignty of the territory. See separate articles on the above-mentioned localities, in which political and economic developments are discussed.

The following table gives the area of Germany before and after the War with a comparison of the population at the census of 1910 and June 16, 1925:

AREA AND POPULATION (BASIS, PERSONS PRESENT), BY STATES

State	Area, square miles	Population	
		1910	1925
Prussia (Preussen):			
Present area	112,626	35,000,830	38,206,092
Former area	134,664	40,165,219	.....
Bavaria (Bayern):			
Present area	29,342	6,882,237	7,411,589
Former area	29,510	6,962,109	.....
Saxony (Sachsen)	5,789	4,806,661	4,979,912
Württemberg	7,532	2,437,574	2,595,114
Baden	5,819	2,142,833	2,336,498
Thuringen	4,527	1,510,538	1,628,398
Hessen	2,970	1,282,051	1,358,445
Hamburg	160	1,014,664	1,128,788
Mecklenburg-Schwerin	5,068	639,958	687,599
Oldenburg	2,480	483,042	553,670
Brunswick (Braunschweig)	1,418	494,339	509,660
Anhalt	888	331,128	351,692
Bremen	99	209,526	332,547
Lippe	469	150,937	166,038
Lubeck	115	115,599	127,540
Mecklenburg-Strelitz	1,131	106,442	112,052
Waldeck <sup>a</sup>	408	52,358	59,281
Schaumburg-Lippe	131	46,652	48,660
Total:			
Present area	180,972	57,798,369	62,592,575
Former area	208,825	64,925,993	.....
Saar Basin	737	651,984	770,000 <sup>b</sup>
Total with Saar, present area	181,709	58,450,353	63,362,575

<sup>a</sup> Waldeck was absorbed by Prussia April 1, 1929.

<sup>b</sup> Estimated.

Overseas emigration from Germany via German and foreign ports was as follows: 1913, 25,843; 1920, 8548; 1921, 23,451; 1922, 36,527; 1927, 61,379. In pre-war years the rapid industrial expansion tended to prevent the large emigration which had characterized the early part of the nineteenth century. Recent figures would seem to indicate a revival of emigration from Germany, the number exceeding a maximum of 115,416 in 1923. This emigration was of particular significance as an indication of living conditions within the country. According to the occupation census of 1907, the total number of wage earners was 30,232,000, of whom 27,274,000 were in the post-war territory. This included all persons engaged in any kind of occupation and those living on their own means, such as pensioners, pupils, institutional inmates, etc. The number of workers in agriculture and forestry for the post-war territory of Germany was 8,554,000; in mining and industry, 10,451,000; in trade and transportation, 3,220,000; in personal services, 431,000; in government employ, 1,511,000. The number of workers of 1927 in agriculture and forestry was about identical with that of 1907; that in mining and industry increased by about 20 per cent, and in trade and transportation, by 20 per cent. A decrease took place in the number of government employees through the abolition of compulsory military service, thus decreasing the army from 800,000 to 100,000 men. The total number of

persons occupied in Germany was, in 1927, about 35,000,000, of whom 17,500,000 were workmen.

**Agriculture.** The total area in 1914 was 54,109,836 hectares. The area of the ceded territories amounted to 7,021,287 hectares, leaving a post-war area of 47,008,549. The 1928 area, inclusive of the Saar Basin, was divided as follows: arable soil, 51,556,972 acres; grass meadows and pasture, 20,165,876; vineyards, 204,575.

The following indicates live stock before and after the War:

Animals	Dec. 1, 1913	Dec. 1, 1928
Horses	4,558,329	3,710,500
Cattle	20,994,344	18,386,200
Swine	25,659,140	20,072,300
Sheep	5,520,737	3,625,600
Goats	3,548,484	2,885,100

The accompanying table gives the area and production of the principal crops of Germany in 1913 and 1927:

Crop	Area (thousands of acres)		Production (thousands of units—bushels, except as indicated)	
	1913 <sup>a</sup>	1927	1913 <sup>a</sup>	1927
Wheat	4,143	4,321	148,555	120,521
Rye	12,095	11,610	398,874	269,030
Barley	3,413 <sup>b</sup>	3,653	139,639 <sup>b</sup>	125,754
Oats	9,698	8,589	593,773	437,251
Potatoes	6,924	6,918	1,617,386	1,379,707
Sugar beets	1,153	1,073	13,986 <sup>c</sup>	10,854 <sup>c</sup>
Hay, alfalfa, and clover	17,773	18,781	36,843 <sup>c</sup>	35,407 <sup>c</sup>

<sup>a</sup> Present boundaries.

<sup>b</sup> Spring barley only.

<sup>c</sup> Unit, metric ton.

**Unemployment.** The number of unemployed and part-time workers drawing government benefits in the unoccupied territory of Germany on Dec. 31, 1927, was 1,188,274 as compared with 1,748,579 at the end of 1926.

**Industry.** The following table gives the essential mineral and industrial production for the pre-war and post-war periods. It will be ap-

MINERAL AND INDUSTRIAL PRODUCTION  
(Thousands of Metric Tons)

Product	1913 <sup>a</sup>	1925	1926	1927
Coal	140,753	132,622	145,296	153,599
Lignite	87,228	139,725	139,151	150,503
Coke	31,667	28,397	27,297	32,261
Briquets, coal	6,490	5,591	5,359	4,971
Briquets, lignite	21,977	33,063	34,358	36,463
Iron ore	7,309	5,923	4,793	6,625
Lead <sup>b</sup> met. tons	51,197	35,840	45,626	.....
Copper <sup>b</sup> do	26,825	23,840	27,158	.....
Zinc <sup>b</sup> met. ton	88,102	49,121	79,393	.....
Potash (K <sub>2</sub> O)	1,189	1,353	1,100	1,240
Coal tar and tar concentrates	1,026	1,204	.....	.....
Pig iron	10,916	10,089	9,636	13,102
Crude steel	11,768	12,051	12,228	16,310
Rolling-mill products	9,520	9,308	9,017	12,872
Shipbuilding <sup>c</sup>	465,226	402,713	171,572	265,554

<sup>a</sup> Present boundaries.

<sup>b</sup> Metal content of ore.

<sup>c</sup> Gross tons launched.

The coal output for 1928 was 150,876,000 metric tons.

parent from these statistics that Germany has made substantial progress in practically every field of industry.

There were 23,202 breweries in 1913 producing 09,200,000 hectolitres of beer, or 103 litres per head of the population. In 1927 breweries produced 51,608,000 hectolitres. In 1913, 133 factories produced 1,083,000 bottles of fruit wine.



In 1926, 115 factories produced 1,300,000 bottles of fruit wine. In 1913, 157 factories produced 11,808,000 bottles of sparkling grape wine; in 1926, 127 factories produced 14,781,000 bottles of sparkling grape wine. In 1927 the wine yield from a total of 181,872 acres of vines was 31,407,018 gallons. There were 378 factories in 1913, producing 2,716,000 tons of sugar; in 1928, 249 factories produced 1,646,379 tons. Cigarettes numbering 12,412,000,000 were produced in 1913 and 31,934,129,000 in the year ending Mar. 31, 1928. According to the industrial census of 1925, there were in Germany 1,852,737 industrial establishments, with 12,704,135 workers.

The value of German exports for 1928 increased by more than 1,250,000,000 marks over 1927, with the result that the adverse trade balance of 3,345,800,000 marks incurred in 1927 was reduced to 1,992,500,000 marks for 1928. Over 78 per cent of the increase in exports was attributed to greater sales of finished goods. The economic condition of the country during 1928 was, on the whole, not satisfactory. Labor difficulties, inadequate support for the domestic market, and increasing unemployment had a depressing influence. The export trade was benefited by generally improved conditions in other European countries. Another development in the economic situation was an improved foodstuffs balance for 1928, the 1927 deficit being reduced by more than 300,000,000 marks. Trade in raw materials remained practically unchanged.

**Communications.** The government railroads are managed and administered by the German Railways Co., but remain the property of the state. In addition to the State Railways, there were 2277 miles of normal-gauge line in 1920, which belonged to private companies.

## STATE RAILWAYS

		1913 *	1925	1927
Length of line	miles	31,529	33,120	33,320
Locomotives	number	29,243	28,110	25,577
Passenger cars	do	64,315	66,508	62,954
Freight cars	do	660,951 <sup>b</sup>	699,299	672,541
Passengers carried	millions	1,577	2,106	1,924
Passenger-miles	do	22,742	30,416	28,400
Freight carried	1000 metric tons	399,000	373,010	489,000
Freight ton miles	millions	31,956	34,775	45,120
Train miles	thousands	150,123	128,425	.....
Gross receipts <sup>c</sup>				
	million marks	3,058	4,669	5,011
Passenger service	do	904	1,431	1,373
Freight service	do	1,927	2,869	3,626
Gross receipts, equivalent (\$1,000,000)		728	1,111	1,191

\* Present boundaries.

<sup>b</sup> Figures for rolling stock are for railways of pre-war Germany.

<sup>c</sup> Including miscellaneous receipts not shown separately.

A combination air-and-rail passenger service was inaugurated in 1929 by the Deutsche Luft Hansa, effective throughout the German Federation. Passengers may change from airship to train, or vice versa, without additional expense or excessive negotiation.

The German mercantile marine, including steam and motor vessels, amounted in 1914 to 2090 ships with 5,134,720 registered gross tons. On June 30, 1928, it totaled 3,777,251 registered gross tons. The number of seagoing vessels en-

tering German ports in 1913 under all flags was 115,966, of which 26,037 were under foreign flags. The total tonnage was 34,772,177, of which that under foreign flags amounted to 13,540,835. Vessels clearing amounted to 117,375, of which 26,019 were under foreign flags. The tonnage was 34,921,806, of which foreign flags accounted for 13,645,219. In 1927 vessels entering German ports numbered 86,080, of which foreign flags amounted to 19,636. Tonnage was 39,912,430, of which 19,459,529 were under foreign flags. Vessels clearing in 1927 were 89,173, of which foreign flags were 19,277. Tonnage was 39,659,776, of which foreign flags amounted to 19,179,601. The total sea-borne traffic at the seven leading German ports during 1928 showed an increase of 4.3 per cent over 1927 and of 29 per cent over 1925. The tonnage figures for 1928 are inward, 32,660,000; outward, 16,366,000. During the calendar year 1927, 53,711 merchant vessels, aggregating 19,012,006 net tons, passed through the Kiel Canal.

## GERMAN IMPORTS AND EXPORTS

1913 AND 1928

(In millions of gold marks)

	Imports		Exports	
	1913	1928	1913	1928 <sup>a</sup>
Live animals	289.7	145.3	7.4	18.7
Food stuffs and beverages	2,807.8	4,195.5	1,069.5	630.6
Raw material and semi-manufactured articles	6,280.0	7,246.4	2,274.1	2,703.6
Manufactured articles	1,392.2	2,458.1	6,746.2	8,700.0
Gold and silver	436.4	238.3 <sup>b</sup>	101.4	21.9 <sup>b</sup>
Total	11,206.1	14,283.7	10,198.6	11,474.8

<sup>a</sup> Including deliveries in kind under Reparations.

<sup>b</sup> 1927 figure.

**Commerce.** In 1913 the value of all German imports was 11,200,100,000, gold marks and the value of all exports was 10,198,600,000 gold marks. After the World War, the value of imports in gold marks dropped to 9,693,800,000 in 1925 and to 8,521,700,000 in 1926, rising in 1927 to 11,658,000,000 and in 1928 to 15,012,200,000. The value of exports fell to 6,994,700,000 gold marks in 1925 and rose to 7,880,700,000 in 1926, to 8,100,000,000 in 1927, and to 12,184,800,000 in 1928. These figures include deliveries in kind under Reparations; also gold and silver.

**Currency and Credit.** The circulation of paper money in 1913 amounted to 2,100,000,000 paper marks in Reichsbank notes, 110,000,000 in currency notes, and 140,000,000 in private bank notes, a total of 2,400,000,000 marks. Specie in circulation totaled 3,700,000,000 marks; a grand total of specie and paper money of 6,100,000,000 marks was in circulation. On Jan. 31, 1928, the number of Reichsbank notes in circulation was 4,237,200,000. Private bank notes in circulation were 176,300,000 marks and notes of the Rentenbank, 625,700,000 marks, making a total of paper money in circulation of 5,039,200,000 marks. The circulation of stable currency in Germany on Jan. 31, 1928, expressed in gold marks, was 5,922,300,000.

The following tables from the U. S. *Commerce Year Book* give the results of recent German budgets and the status of the public debt:

## GOVERNMENT RECEIPTS AND EXPENDITURES

(Thousands of Reichsmarks)

	1924-25, actual	1925-26, actual	1926-27, preliminary	1927-28, budget	1927-28, equivalent (\$1000)
<b>Ordinary receipts</b>	<b>7,559,638</b>	<b>7,715,328</b>	<b>8,525,570</b>	<b>8,657,320</b>	<b>2,062,174</b>
Income tax	2,213,302	2,253,844	2,253,731	2,620,000	624,084
Business turnover tax	1,917,784	1,415,966	865,011	900,000	214,380
Property, corporation income, transport, and other re- current taxes	1,554,554	1,163,698	1,446,028	1,760,000	419,232
Customs	356,568	590,463	940,272	890,000	211,908
Consumption taxes	1,193,766	1,372,138	1,521,636	1,555,000	370,401
All other	323,664	919,719	1,498,892	932,320	222,079
<b>Ordinary expenditures</b>	<b>6,800,928</b>	<b>7,535,188</b>	<b>8,326,092</b>	<b>8,657,320</b>	<b>2,062,174</b>
Debt service	201,016	112,327	340,372	488,320	116,556
Military and naval	457,784	567,532	536,837	640,555	152,580
Pensions	1,066,827	1,889,881	1,456,949	1,474,823	351,303
Labor department	222,618	491,942	655,820	882,217	210,144
Allotments to States and local governments	2,767,192	2,550,091	2,620,534	2,892,923	689,094
Miscellaneous	777,778	1,664,909	2,458,811	2,095,916	499,486
Transfer to					
Extraordinary account	308,996	340,305	27,915 *	5,000	1,191
Reparations account	998,717	418,201	804,684	175,566	41,820
Extraordinary receipts including transfers	838,196	678,787	881,276	474,534	113,034
Extraordinary expenditures	704,937	678,787	881,276	474,534	113,034
Reparations account, including transfers (receipts equal expenditures)	1,784,358	1,706,964	1,758,338	1,976,903	470,898
Equivalent (\$1000) at par:					
Ordinary receipts	1,800,706	1,837,791	2,030,791	2,062,174	.....
Ordinary expenditures	1,619,981	1,794,882	1,983,275	2,062,174	.....

\* Surplus brought over from 1925-26.

PUBLIC DEBT  
(Thousands of Reichsmarks)

The table does not include reparations obligations but does include, for the first time, the item "Government bonds," which covers the old paper mark debt, revalorized under the law of July 16, 1925 (provisional), and that part of the new 5 per cent loan which was paid in by March 31, 1927. The amount to be paid against the revalorized debt during 1927-28 is budgeted at 356,800,000 marks.

	Mar 31, 1924	Mar 31, 1925	Mar 31, 1926	Mar 31, 1927
Government bonds, internal	.....	.....	1,753,632	2,106,077
Treasury notes and bonds, internal	598,904	905,578	108,306	20,813
Bank loans, internal	1,331,970	1,411,470	1,271,870	1,130,365
Foreign loans	.....	945,655	922,810	911,221
Miscellaneous	475,100	132,796	82,848	182,736
<b>Total</b>	<b>2,405,974</b>	<b>2,795,505</b>	<b>4,139,465</b>	<b>4,351,212</b>
Equivalent (\$1000), at par	573,103	665,889	986,021	1,036,459

For the year ending Mar. 31, 1928, the total revenue was 10,412.7 million Reichsmarks and the expenditures 10,195.8 million Reichsmarks. Estimates for the year ending Mar. 31, 1929, placed the total revenue at 10,634.9 million Reichsmarks and total expenditures at 10,631.2 Reichsmarks.

**History.** As long as the War was only imminent, there were immense popular peace demonstrations, organized by the Socialists; but once it had become an established fact, it swept the German people into an orgy of patriotism and war enthusiasm which increased with every new victory reported. The belief of the great majority of the Germans that the War was a struggle for national existence was strengthened by official manifestos. Even the great Social Democratic Party supported the War and voted, on Aug. 4, 1914, for the first war credits and, on September 2, for the second, condemning the anti-war activities of the International Socialist Bureau. This undivided support of the Government continued until spring of 1915. In March of that year, the Socialists, Liebknecht and Rühle, in the Reichstag refused to vote for the budget and others criticized the General Staff, and in August, during the debate on war credits, the Socialist leader demanded democratic reforms and expressed the hope for an early peace. In December Scheidemann, the Socialist leader, in-

terpellated the Government in the Reichstag on possible peace terms, the Socialist majority protested against annexation, and 18 Socialists voted against the war credits. It was evident that a feeling was becoming widespread that a moderate peace should be made as soon as possible. Believers in the "defensive war" were apprehensive at the growing Nationalist appetite for annexations, and expected internal reforms were not forthcoming.

But the most potent factor in the slackening of war enthusiasm was the food situation which daily grew more unsatisfactory. Dependent on imports for most of her raw materials and much of her food, Germany was reduced by the Allies' ever-tightening sea blockade to the point where stringent measures alone kept the army supplied with sufficient war materials and saved civilians from starvation. See BLOCKADE, ALLIED. The Government set up a rigid system of centralized economic control. Food prices continued to rise in spite of the fixing of maximum prices, and drastic action was necessary to check extravagant consumption and speculation. Early in 1915, bread was rationed and similar measures were put in force in the same year, while steps were taken to increase cultivation and to curb profiteering. On May 22, 1915, the War Food Office was created and meat and milk were later rationed. In July, 1916, the War Clothing Office

was opened. The policy of meeting the ever-mounting cost of the War through a series of long-term loans brought the total debt finally to 161,000,000,000 marks and by 1918 German finances were approaching hopeless disorder. Only in 1916 and 1917 did the Reichstag impose new taxes and these were quite inadequate.

The demand for ever-increasing sacrifices gradually destroyed the early patriotic harmony. In March, 1916, a Socialist minority of 18 under Haase dissented from their party's support of the U-boat resolution and formed the Social Democratic Labor Union, which henceforth uncompromisingly opposed the War. Late in 1916, Bethmann-Hollweg showed his disagreement with the military war aims and methods, especially as to unrestricted submarine warfare, but finally allowed the military leaders to dominate him. Von Hindenburg and von Ludendorff, who had become chief of the general staff and quartermaster general, respectively, at the close of August, 1916, with increasing frequency assumed the right to dictate governmental policies; indeed, Ludendorff was little less than military dictator of Germany from 1916 to 1918, and his influence was constantly exerted in favor of annexationist war aims and political reaction.

In the Reichstag, a majority consisting of the Centre, the Progressives, and the Social Democrats supported the Chancellor's policy of moderation in opposition to the Conservatives and National Liberals on the Right and a small group of ultra-radical Socialists on the Left. At the end of 1916, the food situation had become so serious that further restrictions were laid on many articles, and substitutes, too often ineffective, were introduced. The year's harvest was bad. On Dec. 2, 1916, the Auxiliary Service Law was passed, putting all males between 17 and 60 to work. The stranglehold of the blockade induced a civilian state of mind which gave to the military demand for more drastic methods of warfare, especially the unrestricted submarine warfare, a powerful appeal.

Few Germans at this time had any clear conception of the possible effects of America's entrance into the War. Thus, public opinion drifted more and more into a spirit of desperate recklessness and swung over to the viewpoint of the General Staff. When the Chancellor, on Feb. 1, 1917, announced unrestricted submarine warfare, the parties voiced little definite opposition. However, distrust of the Government and desire for peace continued, and were clearly manifest in the great debate on war aims in May, 1917. This sentiment came even more strongly to the foreground during the following months because of the disappointing results of the submarine campaign, the energetic participation of the United States in the War, the feeling that Germany was facing overwhelming odds, and the reluctance of the Government to grant electoral reforms.

On July 16, 1917, Erzberger, leader of the Centre and the majority, repudiated submarine warfare and demanded immediate steps toward peace. The majority parties were now in full opposition to the Chancellor, who, on the other hand, was equally opposed by the parties of the Right for his moderation. He was forced to resign, on July 14, 1917, and was succeeded by Dr. Michaelis, who also soon found himself in difficulties. On July 19, the Left carried by 90 votes a resolution calling for peace by agreement, no forced annexations, and no policy of

coercion after the War, but declaring that, if such a peace could not be obtained, the Germans would stand together and fight as one man. By autumn, the hostility to Michaelis had become so strong that all parties except the Conservatives agreed that he was impossible. He resigned October 28 and was succeeded by von Hertling, Bavarian Prime Minister, who accepted the Peace Resolution as the basis of his policy, but proved his bureaucratic spirit by introducing into the Prussian Diet a franchise bill which was but a tardy step in the direction of electoral reform.

By the opening of the year 1918, milk, meat, and fat had become luxuries, profiteering had grown apace, town and country were increasingly antagonized, fuel, textiles, and other materials had grown scarce, and the system of central bureaucratic control was beginning to break. The spring military successes and the benefits accruing from the Bolshevik Revolution temporarily revived the annexation spirit, but only checked the war-weariness arising from the economic distress. Great strikes in January, 1918, evinced the dissatisfaction with the Government, which was enhanced by the behavior of the military leaders in the negotiations with Soviet Russia and the failure of the Russian and Rumanian peace treaties to lead to a general peace. Erzberger became increasingly hostile to the Government. Germany's military strength had thus far enabled the government to restrain the peace movement, but in the summer of 1918, military reverses presaged an internal crisis. On June 21, Foreign Secretary Kühlmann declared in the Reichstag that it was no longer possible to attain peace by force of arms, but the Chancellor repudiated his statement and he was forced to resign.

During the following month came the final offensive of the Allies on the western front, and with it the movement for peace in Germany entered its last stage. With the defection of Bulgaria, the Hertling cabinet was forced out of office, and Prince Max of Baden formed a new government on the basis of President Wilson's Fourteen Points. The grim course of events made short work of his plans. After four years of hardship and sacrifice, the spirit of revolution had gripped the German people, and in the face of the impending Allied military victory, their former discipline had given way to panic and to a naïve confidence that, by complete surrender, a just peace could be obtained. At the same time, the Chancellor received frantic requests from the German General Staff that immediate application be made for an armistice, since only the cessation of hostilities could save the German Army from military disaster. Events followed each other in rapid succession. The revolution broke out in Kiel in the first days of November. A series of mutinies occurred in the navy, and the Republic was proclaimed in the principal seaports. In Munich Kurt Eisner set up a red republic on November 7. Two days later, the revolution had spread to Berlin, and Prince Max turned the Government over to Ebert, leader of the Socialists. The Emperor fled to Holland on the following day, but did not sign the abdication document until November 28. For the account of the course of the diplomacy of the Central Powers during 1914-18, see *AUSTRIA-HUNGARY AND WAR DIPLOMACY*.

The revolution was now in full swing. In Berlin, the overthrow of the Imperial government took place without armed resistance from

the monarchists. Although the revolutionary movement had been actually engineered by the Independent Socialists, and the Majority Socialists had not taken part until the revolution was an established fact, the latter now assumed full charge of it and steered it into rather moderate channels to forestall the establishment of a Soviet republic. A provisional government was formed in Berlin under the title of the People's Commissaries, which immediately appointed a cabinet consisting almost entirely of non-Socialists. Thus, the machinery of government was started running and Germany was helped over the dangerous period of disorder which otherwise would have led to the establishment of an ultra-radical government. Meanwhile revolutionary Workmen's and Soldiers' Councils had sprung up and assumed power everywhere in the Reich. The chief element of opposition to the provisional government was the Workmen's Council in Berlin, which claimed supreme legislative authority for the whole Reich.

In the full realization of this serious situation, the government called a congress of delegates from all the councils. At this congress, held in Berlin on Dec. 16, 1918, executive power was delegated to the six People's Commissaries, who thereupon issued at once a call for elections for a National Assembly. Thus the Berlin Council as the chief element of opposition was definitely eliminated. Foiled in their designs, the ultra-radicals, under the leadership of Karl Liebknecht and Rosa Luxemburg, organized the Spartacus League and attempted by force of arms to seize power and to set up a dictatorship of the proletariat. After minor disturbances, the Spartacist Sailors' Division started a revolt in Berlin, on Dec. 23, 1918, which was subdued by the Government by means of regular troops on the following day. Primarily as a result of this drastic action of the Government, the three Independent Socialist members in the Council of Commissaries, who favored a more revolutionary policy, resigned during the last days of December and were replaced by Majority Socialists. In January, 1919, a new and more vigorous Spartacist insurrection occurred which was put down by Noske, the Majority Socialist Minister of National Defense, only after sanguinary fighting in the streets of Berlin. Renewed uprisings in Berlin during March and in various other cities during April were quelled by the Reichswehr. With the close of these revolts, the Majority Socialist government had weathered the threatening danger from the Left for the time being.

The elections to the National Assembly in January, 1919, showed a great increase in the Socialist vote, although the recruiting strength of the Socialist parties had suffered considerably from their internecine strife. The combined Socialist vote was 13,750,000, against 16,000,000 votes for the bourgeois parties, and the two Socialist parties secured 185 seats in the Assembly out of a total of 421. The revolutionary transformation which had occurred in Germany, and, paradoxically, the continuity of the new republican régime with the old order, were significantly exemplified in the metamorphosis of the political parties which entered the National Assembly. The German National People's Party (popularly, the Nationalists), with their 42 delegates, were simply representatives of the old parties of the Right, i.e., the Conservatives

and Free Conservatives; they were opposed to democracy, to Socialists and Jews, and to the Treaty; they represented monarchist and militarist reaction. The German People's Party, with 21 delegates, was the emaciated but influential successor of the old National Liberal Party, the party of big business, and soon became almost a personal faction representing the coal and iron king, Hugo Stinnes. The Christian People's Party, with 88 representatives, was so clearly recognizable as the quondam Catholic Centre that the old name was used more frequently than the new. The Democratic Party, heir to the old Progressive Party, showed surprising strength, with its 75 representatives and distinguished leaders, one of whom was to draft the new constitution. With the addition of 10 independents, these bourgeois parties mustered 236 votes in the new Assembly, as against 163 moderate Social Democrats, i.e., Majority Socialists, and 22 more radical Independent Socialists. These returns showed clearly that the revolution, begun by admirers of Russian Bolshevism, had taken a nonsocialist turn, but the danger of social revolution was not wholly averted.

Fearing revolutionary upheavals in the capital, the new Parliament assembled on Feb. 6, 1919, in Weimar instead of Berlin, and elected on February 11 the Socialist Ebert as President of the Reich. Immediately afterward, a coalition cabinet consisting of Majority Socialists, Centrists, and Democrats was formed by Scheidemann. The Right, composed of the Nationalists and the People's Party, and the extreme Left or Independent Socialists opposed the new government and did their best to block its measures. It was the ratification of the Treaty of Versailles, however, which caused the first cabinet crisis in Republican Germany. Scheidemann, who by previous statements had committed himself to non-ratification of the Treaty, resigned with his cabinet on June 21, in order to leave the President free to take the necessary steps for ratification. After some difficulties, the Majority Socialist, Bauer, formed a new cabinet of Centrists and Socialists. A majority in the Reichstag, consisting of the Majority Socialists, the Independent Socialists, the Centre, and some of the Democrats, thereupon authorized the Government, on June 23, to sign the Treaty. On June 28, the German representatives duly affixed their signatures, and the Reichstag approved the Treaty on July 9.

On July 31, 1919, the new constitution, drafted chiefly by Professor Preuss, was adopted in the Reichstag by 262 votes against 75. While it contained all the characteristic juridical features of any modern constitution, it applied the democratic principle of equal rights with an almost unprecedented thoroughness and included a number of educational, economic, and social provisions which were distinctly novel. It was divided into two parts: the composition of the Reich, and the fundamental rights and duties of Germans. The German Reich was declared to be a republic whose sovereignty was to be vested in the people. It was provided that each state should have a liberal constitution and a parliament elected by universal, equal, and secret suffrage. All citizens over 20 years of age were to receive the vote, women as well as men. To avoid any inequality, elections were to accord with the principle of proportional representation, and the same democratic franchise was

to govern elections to every German diet and municipality. The Reichstag was to be elected for four years. The President, elected for seven years by a direct vote of the people, was to have power to conclude treaties, receive ambassadors, etc., but declarations of war and peace were to be issued by the Reichstag, and treaties with foreign states were to be ratified by it. The Chancellor and the ministry were to be nominated by the President, and the former was to direct the foreign policy and to be responsible for the cabinet. The Imperial Council was to be composed of the representatives of the states, each of which was to have at least one vote; the votes of the large states were to be proportionate to their populations. The laws were to be submitted to a plebiscite if the President desired.

Article 18, permitting the alteration of state boundaries by the national government with the consent of the population of the regions concerned, was one of many examples of the strongly national and centralized nature of the new government, as contrasted with the federal constitution of the defunct Empire. This article was later taken advantage of to consolidate eight Thuringian duchies and principalities (Saxe-Weimar, Saxe-Meiningen, Saxe-Altenburg, Saxe-Gotha, Schwarzburg-Rudolstadt, Schwarzburg-Sonderhausen, and the two principalities of Reuss) into a unified state of Thuringia and to unite Saxe-Coburg with Bavaria, thus reducing the number of states in the Reich from 25 to 17.

The most important feature of the second part of the constitution was the article providing for the establishment of a system of industrial democracy through works councils and an economic parliament for the Reich. The latter, the Economic Council, was to give an opinion on all bills of an economic and social character and was also to have power to propose such measures. The Council, however, was not to be a legislative organ. Important also was the opening provision of article 151: "The ordering of economic life must reconcile the principle of economic justice with the aim of a civilized life for everybody." The most unusual clause, in many respects, provided that in the schools of the Reich every effort must be made to inculcate a spirit of conciliation with the other peoples of the world.

In September, 1919, the cabinet was enlarged by the reëntance of the Democrats. At the same time, the Works Councils Bill was passed by the Reichstag. As adopted, the bill represented a compromise and did not by any means embody the radical principles which had been originally proposed, nor was it applied without further moderating compromises, bitterly as the Socialists protested. Another important event of the legislative session was the Socialization Law with reference to the mining industry. Republican Germany had taken over a cheerless economic heritage from the imperial system. After the revolution, conditions had become more desperate month by month. The debt had risen to 220,000,000,000 marks, the budget amounted to 15,000,000,000 of ordinary expenditure and to 41,000,000,000 of extraordinary expenditure. New sources of revenue had to be found, and with this end in view, Minister of Finance Erzberger proposed an "emergency contribution" which amounted to a partial confiscation of wealth. The measure was passed by the Reichstag on Nov. 17, 1919, by 238 votes against 43.

The application of the Peace Treaty, which went into effect on Jan. 10, 1920, caused universal discontent in Germany. The Allies' demands for the extradition of the war criminals, including the foremost military leaders of Germany, and for the reduction of the German Army in accordance with the Treaty, were especially potent in arousing national feeling which reacted against the republican government. The impotence of the latter in the face of relentless pressure from the victors served to weaken the Republic, which had been none too secure from the beginning. Under the leadership of Dr. von Kapp and General von Lüttwitz, a counter-revolution broke out in March, 1920. They seized Berlin on March 13, but the republican government issued from Stuttgart an appeal to the workers to call a general strike, and, when the entire trade-union movement of Germany responded, the counter-revolutionists were forced to evacuate the capital after five days of power.

The Kapp Putsch revealed the weakness of the republican government, but showed also the strength of republican sentiment among the masses. Unable to satisfy the demands of the trade union for far-reaching reforms, the Bauer government fell from power on March 26 and was replaced by a new coalition government under Hermann Müller. The Putsch had indirect consequences more serious than the movement itself. In the Ruhr, the workers organized a proletarian army against the monarchists, defeated them, and took possession of the towns and the mines. Berlin sent troops who with some bloodshed restored order. In Bavaria, the March insurrection led to the complete consolidation of the reaction, which had been steadily marshaling its forces since the overthrow of the Soviet government, in April, 1919. Meanwhile, France had become alarmed at the large bodies of troops in the Ruhr and had occupied Frankfurt and the Mainau. Germany appealed to the League of Nations, but without avail. At San Remo in April, 1920, the French agreed to withdraw as soon as the German troops in the Ruhr had been reduced to the required strength.

The elections for the first German Reichstag on June 6, 1920, were unfavorable to the coalition. They resulted as follows: Majority Socialists, 110; Independent Socialists, 80; Centrists, 67; Nationalists, 65; German People's party, 61; Democrats, 45; Christian Federalists, 21; minor parties, 11. A new coalition cabinet was formed by the Centrist, Fehrenbach, consisting of Centrists, Democrats, and members of the People's Party. It was faced with coercive measures by the Allies, including reparations demands, the award to Poland of a small part of the plebiscite area of East Prussia which had almost unanimously declared for Germany, and the disarmament of German civilians. In the latter part of the year, nationalization of the mines was abandoned for the time being when the joint committee of the Economic Council and the Coal Council adopted a plan favoring the mine owners, one of two proposed by the Socialization Commission.

Between the Armistice and the end of 1920, the internal situation of the Reich had changed very materially. The revolution had mainly spent its force, but had replaced the old aristocracy with a new ruling plutocratic class and impoverished the workers and the middle class. With political power directed by democratic and socialist principles, the real power was wielded by a few captains of industry. Large numbers



were going to the extreme Right or Left, both opposed to the Republic. Nationalist feeling gained day by day and Communism became more and more a factor to be dealt with. Late in 1920, the majority of the Independent Socialists embraced the doctrine of the Third International and with the Communists formed the United Communist Party of Germany, which instigated serious uprising in Central Germany in March, 1921. Meanwhile, the reparations policy of the Allies took its course with fateful consequences for the German political and industrial situation. When the German statesmen refused to accept the severe demands of the conference of Paris, Jan. 24-29, 1921, and of London in February, the Allies imposed their sanctions. At a third conference in London, May 1-5, the Allies presented an ultimatum which forced the Fehrenbach government out of office.

The new government under Dr. Wirth, consisting of Centrists, Socialists, and Democrats, undertook the fulfillment of the Allies' demands. In this spirit, Walter Rathenau, the German Minister of Reconstruction, concluded with Louis Loucheur, the French Minister of Reconstruction, the so-called Wiesbaden Agreement providing for the delivery to France of German materials to be credited to the reparations account. The policy of fulfillment, and especially the Wiesbaden Agreement, met with bitter criticism from the Nationalists, particularly when the expected results were ultimately not forthcoming. The Government's efforts to pay were seriously impeded by the cataclysmic fall of the mark, and for this reason the subject of reparations came up again. The position of the Government was injured still further through the remonstrances of the Allies concerning disarmament, the disbanding of secret military organizations, and the inadequacy of the verdicts rendered by German courts against the so-called war criminals. The intensity of Nationalist feeling at this time became clearly apparent through the murder of Erzberger by a Nationalist zealot, Aug. 26, 1921.

The worst blow of the year, however, and the factor which more than any other since 1918 decreased the industrial strength of Germany and at the same time served to fan Nationalist feeling to white heat, was the partition of Upper Silesia. The plebiscite of Mar. 20, 1921, had resulted in a two-thirds vote for Germany, whereupon the Poles, perhaps fearing a decision unfavorable to them, started an insurrection. Allied troops interfered only when the German population had been given full opportunity to realize that it was at the mercy of the victor. The final award of the Supreme Council, which was based on the report by a commission of the League of Nations, gave the greater and most valuable part of the Upper Silesian industrial district to Poland. On the official publication of the verdict, the Wirth government resigned, but it resumed office again after a reorganization of the coalition cabinet. For a full discussion of the problem, see SILESIA, UPPER.

The reparations problem, the cause of all unrest and anxiety, was acute once more at the end of 1921 and assumed an even graver aspect during the following year. The Conference of Genoa in April, 1922, lost much of its significance because France agreed to participate only on the condition that reparations should not be officially discussed. On Easter Sunday, Apr. 16, 1922, the German and Russian delegates

concluded at Rapallo a treaty whereby peace was reestablished between their countries, and both sides waived all claims arising from the War. This pact aroused a storm of indignation at the conference, which no assurance of good faith on the part of the Germans could pacify. Both Germans and Russians denied that the treaty contained any secret clauses working to the prejudice of the Allies.

In May a moratorium for the year 1922 was granted to Germany by the Reparations Commission, in return for which the Wirth government promised to take measures toward balancing the budget, provided that an international loan was arranged in due time. Subsequently, a loan committee, of which the American banker J. P. Morgan was a member, was formed to study the German finances. Any constructive work on the part of the committee was blocked by the refusal of the French government to make a loan dependent on the modification of the French demands.

While the reparations problem was thus hanging over Germany like the sword of Damocles, the country was sinking ever deeper into the abyss of political hatred and financial and economic disorder. In the summer of 1922, Nationalist conspirators made attempts to murder Scheidemann and Harden and succeeded in assassinating Walter Rathenau, the Foreign Minister. This crime created a violent outburst of popular indignation throughout the Reich, and since it was evidently intended to be a blow at the Republic—Rathenau being the outstanding figure in German political life—a law for the protection of the Republic was enacted. The murder showed clearly the depths of political dissension in Germany. The foes of the Republic made the revolution and republicanism responsible for all the misery which had descended on Germany.

Meanwhile, the mark had begun its spectacular downward movement, and in October, 1922, the dollar exchange had mounted to 3000. The depreciation of the currency provoked confusion in public finances and a complete revolution in prices with all its disastrous consequences. Wages and salaries could not keep pace with prices, and terrible suffering befell the population, particularly the middle classes. The only people who profited by this lamentable situation were the industrialists, the profiteers, and the farmers. The Wirth government tried vainly to stabilize the mark, and conditions continued to grow worse as the year advanced. At the same time, changes had occurred in the parliamentary situation which brought about a cabinet crisis. The Majority and Independent Socialists had re-united at the Unity Conference of Nuremberg, and as a result the United Socialist Party had taken a turn to the Left. Chancellor Wirth sought to reconstruct the coalition government by the inclusion of the German People's Party. To this, the United Socialists would not assent, because, not without justification, they regarded the latter party as officially republican, but unofficially and in sentiment as thoroughly monarchist and reactionary. The Wirth government fell thereupon and was succeeded by a business cabinet under Dr. Cuno. This was composed entirely of bourgeois politicians; the German People's Party was its driving force.

Although the Cuno government pursued the same reparations policy as its predecessor, a

deadlock soon appeared between the Reparation Commission and Germany over a comparatively small default in the delivery of coal, and as a result, the French and Belgians, in January, 1923, occupied the Ruhr industrial district. This action aroused the most bitter resentment and denunciation throughout the Reich. The occupation and the passive resistance of the local population, which was encouraged and actively supported by the German government and people, led to a revival of patriotic ardor and monarchist activity. A still more fateful consequence was the rapid aggravation of the economic and financial situation. When the Ruhr, the chief centre of Germany's economic life, ceased work, production all over the Reich was seriously impeded, and there was an unprecedented increase in unemployment. Moreover, inflation continued without interruption, because the enormous cost of passive resistance in the Ruhr necessitated an ever-increasing output of paper money.

On May 31, 1923, the mark sank below the Austrian crown and collapsed completely during the following months, in spite of all efforts at stabilization. The rapidity of the mark's decline was equaled only by that of the rise of prices, with which wholesale increase in salaries and wages could not keep pace. With the growing depreciation of the mark, the food situation became more alarming, since the farmers were very reluctant to exchange their products for worthless paper money. All faith in the mark vanished completely during the summer and fall, and business and labor began to make loud demands for real money. It seemed indeed as if Germany were headed for the final breakup. All these internal factors brought about the fall of the Cuno cabinet on Aug. 12, 1923; the immediate cause was the withdrawal of Socialist support in the Reichstag. Stresemann, the leader of the German People's Party, formed a new coalition from members of his own party, the Centrists, the Socialists, and the Democrats.

The new government assumed office with the promise of taking immediate and drastic steps to untangle the complicated foreign and domestic problems, and with this end in view acknowledged defeat in the Ruhr by abandoning passive resistance. Likewise, vigorous action was taken in regard to the critical problems of taxation and finance, and for a brief period hope was revived; but the measures adopted led to renewed difficulties with the Nationalists, industrialists, and Communists. By means of a modified form of martial law, serious outbreaks of the extreme Right and Left were narrowly averted, but the steady pressure of the moderate Right, which objected primarily to the drastic financial reforms of the radical Socialist Minister of Finance, Hilferding, forced the resignation of the Stresemann cabinet on October 3. Since no other chancellor was available at this particular time, the Stresemann coalition resumed office after Hilferding had been replaced by a Centrist. In order to render the government more stable in the face of the extraordinary internal situation, a bill was passed by the Reichstag on October 13 suspending certain constitutional rights and liberties and vesting the government with extraordinary power to issue such decrees relative to the financial, economic, and social conditions as might be warranted by the situation.

Such drastic measures seemed necessary, indeed, for the misfortunes of the year culminated in November in a series of events which came near disrupting the fragile structure of the Republic. In October, the Rhenish separatist movement (see RHINELAND) had come to a head, and in the closing months of the year the separatists in the Rhineland and the Palatinate, who were comparatively few in number and recruited for the most part from the dregs of the population, succeeded (with the connivance of the French and Belgian authorities it is charged) in gaining possession of a number of towns. The local population, worn out by the long period of occupation, was cowed by French and Belgian military force. But once the armies of occupation, under pressure from the English and influenced by international public opinion, withdrew their support, the flimsy structure of the "Rhenish Republic" fell to pieces; and the movement petered out in the early months of 1924.

Another danger lay in the rising tide of extreme nationalism, which had found a safe haven in reactionary and monarchist Bavaria. On November 8, the extreme monarchists in Munich under the leadership of Ludendorff and Hitler executed an abortive coup, commonly called the Beer Hall Putsch. Although the coup was easily frustrated and was in itself a rather childish affair, it served to show the extent and boldness of the extreme Nationalist movement. At the trial of the conspirators, which began Feb. 26, 1924, Ludendorff was acquitted but Hitler and three other leaders received short sentences. More serious was the constant friction between the republican government of the Reich and the reactionary government in Munich. It was only through a policy of diplomacy and forbearance that Belin succeeded in preventing an open break between the Reich and Bavaria.

While proceeding in the delicate Bavarian situation with the utmost caution, the Government used coercion against the recalcitrant Communist and radical Socialist governments of Saxony and Thuringia which were removed by use of the federal military and replaced by moderate Socialist governments. The summary action against "Red Saxony" and the forbearance of the Government against monarchist Bavaria caused the Socialists to withdraw from the cabinet. These developments, together with Stresemann's announcement of the abandonment of all assistance to the people in the occupied regions, resulted in a vote of no confidence in the Reichstag and consequently the resignation of the government on Nov. 23, 1923. After a whole week of fruitless endeavor, a new coalition government, consisting of the Centre, the Democrats, the German People's Party, and the Bavarian People's Party, was formed with Dr. Wilhelm Marx as Chancellor. At the request of the new Chancellor, the Reichstag, by a vote of 313 to 18, gave the Government plenary powers without parliamentary sanction for an indefinite period. The chief purpose of this act was to empower the Government to take drastic action in regard to the critical social and economic situation.

Late in 1923, currency reforms were inaugurated whereby a Rentenbank was established which issued a new currency token, the Rentenmark, to be covered by a hypothecation of the entire wealth of Germany. Alongside it, the old paper mark and the mark of the gold loan in August were temporarily to remain legal tender. When the Rentenmark, which was worth some-

what less than a quarter of a dollar, came into circulation it was worth exactly 1,000,000,000 paper marks, but with its appearance the inflation of the paper mark came to a halt. As a result of the introduction of a fixed-value currency, prices early in 1924 were put definitely on a gold basis and general confidence in the currency began to return. At the same time the food situation and the condition of the middle and working classes became worse for several reasons, chiefly the fall in wages and the lengthening of working hours. While the stabilization of the currency had thus been attained through the issue of the Rentenmark, the balancing of the budget remained an open problem.

Meanwhile, the Dawes Committee of experts had begun its investigation of German finances, and under its indirect influence an important step was taken in the direction of budget reform in January, 1924; this was the temporary repudiation of the public debt until after payment of reparations. Further measures aiming at improvement of the financial situation were introduced in the spring of 1924, and as a result, there was a continued recovery of Germany during the first half of the year, not only in regard to finances, but also in a general economic sense. While the food situation was still grave and there was by no means cause for rejoicing, yet it was felt that the worst was over. This feeling was strengthened by the Dawes Report (see REPARATIONS) and by the results of the French elections in May, 1924. The Dawes Report was regarded by most Germans as acceptable in the main, not because of its satisfactory conditions, but because it seemed to supply a basis on which in due time an ultimate accord on reparations might be reached, especially as it was backed by the prestige of the United States. Even the Nationalists were not outspoken in their opposition to it.

The mild form of martial law was ended early in 1924, and two weeks later, on March 13, the Reichstag, which had been in session for four years, was dissolved. New elections were held on May 4. The results were approximately as follows: Socialists, 100; German National Party, 90; Centrists, 62; Communists, 62; German People's Party, 44; People's Freedom Party, 32; Democrats, 25; Bavarian People's Party, 16; minor parties, 28. The outstanding feature of this election was the strengthening of the extreme Right and Left at the expense of the middle parties supporting the Republic. It is true that much larger inroads on the republican majority had been expected; yet the coalition upholding the Republic had been only a narrow working majority. At the same time, the German People's Party, the parliamentary tool of the great industrialists, although nominally a member of the republican coalition, was in spirit thoroughly monarchist. Thus, the Republic rested on a more precarious basis than at any other time since its creation, if the line-up of the political parties may be taken as a criterion. As a matter of fact, matters were even worse than the parliamentary situation indicated, for many Germans who had Nationalist and monarchist sympathies voted for republican parties chiefly out of consideration for the Dawes Report. Ever since 1919 there had been an uninterrupted swing to the Right and the Left. After the Armistice, the Republic was looked on by the great majority of the German people as

established, and the monarchy was to all intents and purposes dead; but the Peace Treaty and all its dismal consequences, reparations, the Ruhr occupation, the never-ending national humiliation, and the resulting economic misery, had almost destroyed faith in the Republic and induced Germans increasingly to seek salvation in monarchism or communism.

In view of the large Nationalist representation, the Marx cabinet resigned after the election, and President Ebert turned to the Nationalists for the formation of a new coalition government, but the latter, who were perhaps not overanxious to assume office at this particular time, advanced such extreme conditions, such as the nomination of Admiral Tirpitz as chancellor, that President Ebert fell back on ex-Chancellor Marx. The latter resumed office for the time being with a coalition, consisting of the Centre, the Democrats, the German People's Party, and the Bavarian People's Party. With the support of the Socialists, this government had a slight majority in the Reichstag. The attitude of the Nationalists was due primarily to their unwillingness to take a definite stand for or against the Dawes Report. Early in June, 1924, the Reichstag by a majority of 64 voted in favor of acceptance of the Dawes Report, and immediately steps were taken to draft the laws required under the plan.

On June 30, 1924, the government of the Reich accepted the demands of the Allies made in March for an investigation of military conditions in Germany, reorganization of her police force, etc., at the same time denying emphatically that Germany was building up a secret military organization. With Germany's acceptance of the Dawes Plan, Premiers MacDonald and Herriot arranged for a conference in London to formulate plans for putting it into effect. This meeting opened on July 16, with representatives of the Allied Powers in attendance. On August 5, the German delegates entered the conference, the occasion marking the first time since the War that the Germans had negotiated on a footing of equality with the Allies. They immediately began pressing for an evacuation of the Ruhr. Premier Herriot finally consented to a complete evacuation within a year and an economic evacuation to begin at once, provided the Germans faithfully fulfilled their obligations, and the Germans accepted. Other agreements were quickly arrived at, and Chancellor Marx returned to Germany to face the task of obtaining ratification of them by the Reichstag.

The difficulty was increased by the necessity, under the Constitution, of obtaining a two-thirds vote to pass the bill denationalizing the railways. In the voting on this measure, the Nationalists, who had strongly opposed the Dawes Plan as a party, had the balance of power and thus held the fate of the whole plan in their hands, since it had to be taken as a whole or not at all. Faced with this responsibility, they hesitated, and finally left the decision to their individual members. Enough of these supported the bill to ensure its passage. With an American, Owen D. Young, as Agent for Reparations, the Dawes Plan was put into effect at once, Germany making her first payment of 20,000,000 gold marks on September 1. Shortly thereafter, Mr. Young was succeeded by another American, S. Parker Gilbert.

With the reparation difficulty thus temporarily adjusted, the Ruhr in the process of being

liberated, a dependable currency in use, and an international loan floated with surprising ease, economic conditions in Germany showed a marked improvement and the general prospect became brighter than for many years. But the opposition of the Nationalists to the Dawes Plan agreements had been placated only at the price of a promise of participation in the government. When other parties firmly refused to accept this arrangement, a dissolution of the Reichstag was forced and elections were set for December 7. They resulted in a strengthening of the centre parties and a turning away from both the Communists and the extreme nationalists. But the new line-up made the task of forming a coalition cabinet difficult and Chancellor Marx resigned December 11 rather than accept Nationalists into his cabinet. It was not until Jan. 15, 1925, that a new ministry was formed.

The event had more than the usual significance attaching to a cabinet change. Supported by the two Nationalist parties and the Centre Party, the new government marked a distinct turn toward the position of the conservatives in domestic affairs and that of the advocates of an assertive nationalism in foreign affairs. To a degree, it thus reflected popular sentiment, in which a distinct revival of national spirit was evidenced. The opponents of the ministry even charged it with a desire for a return of the monarchy, but the new Chancellor, Dr. Luther, vigorously refuted the idea in his first speech to the Reichstag and promised to combat any movement that might be directed toward the overthrow of the Republic.

With the Nationalists to the front, there was much apprehension as to the effect on Germany's relations with other countries; but it was somewhat allayed when Dr. Luther made it clear that he supported the policies of Dr. Stresemann, who remained as Foreign Minister. These policies comprised a far-reaching programme characterized by a consistent effort to reach an accord with the victors in the late War and to reinstate Germany in a strong position through conciliatory rather than intransigent measures. The adoption of the Dawes Plan and the evacuation of the Ruhr constituted one major step in the working out of this programme. Stresemann now looked forward to the entrance of Germany into the League of Nations and the framing of a pact with France for a mutual guarantee of security as the next big steps. To accomplish these ends, he needed a foundation of domestic support which the advent of the Nationalists threatened to destroy. Dr. Luther, leaving to Stresemann the task of carrying on foreign negotiations, took upon himself the responsibility for preserving his Reichstag majority by putting through various desired measures of internal interest.

Before much could be done in either direction, the attention of the whole country was diverted for a while from specific issues by the death of President Ebert on February 28 and the political ferment that followed. Although berated by extremists of both Right and Left almost up to the moment of his death, the first President of the Republic had come to be highly regarded and even beloved by the masses of the people for the steady strength with which he held the nation on its course through the stormy post-war years. The high honors paid to him by the whole nation were a very genuine testimonial to his worth.

Chancellor Luther acted as President until March 6 when Dr. Walter Simons, president of the highest court, took over the duties pending the choice of a new President. After a bitter campaign, the elections were held on March 29. They resulted indecisively, with no candidate receiving the required majority. Jarres, the Nationalist candidate, led in the voting with 10,408,000, followed by Braun, Socialist, with 7,798,000; Marx, Centrist, with 3,885,000; Thälmann, Communist, with 1,871,000; and others with smaller totals. Further elections, in which a plurality of votes would decide the choice, were thus made necessary. The parties of the Right concentrated on Marshal von Hindenburg, the aged popular hero of the War, and the Left on ex-Chancellor Marx. The elections held on April 26 gave von Hindenburg 14,656,000 votes, Marx 13,752,000, and Thälmann 1,931,000. When the former leader of the German Armies took the oath of office on May 12, he professed entire loyalty to "the common welfare of the German people," and neither then nor later gave any support to the newly awakened hopes of the monarchists.

The general result of the whole two months of political strife was to confirm the strength of the hold which the republican form of government had upon the German masses. In the Reichstag, a number of important measures were enacted. Bills for raising revenue included a comprehensive tax bill, raising the rates of excise taxes on beer and tobacco but continuing from the previous year a gradual reduction of the sales or turnover tax, lowering it from 1½ per cent, the rate applying since Jan. 1, 1925, to 1 per cent, as of Oct. 1, 1925. The income tax was likewise cut by 25 per cent. A new tariff law was passed, partly for raising revenue, partly for protection, and partly for bargaining purposes in dealing with other countries. The new rates took the country back practically to the position of 1903. The so-called "revaluation bill" provided for a measure of compensation for holders of government and industrial bonds, owners of mortgages, etc., who had seen the values of these possessions wiped out by inflation. Political prisoners were freed by an amnesty bill and a number of proposed commercial treaties were acted upon, including one with the United States.

In following through his plans for more cordial relations with the Allied Powers, Dr. Stresemann was particularly fortunate in having radical or liberally inclined foreign ministers to deal with in both France and England. The agreements of the London Conference had been made possible by the presence of Ramsay MacDonald at the helm in Great Britain and Herriot in France, both eager for a more harmonious European concert. Briand likewise made a conciliatory attitude the central feature of his direction of French foreign affairs both as Premier and as Foreign Minister. The Council of Ambassadors, however, introduced a harsh note when, in December, 1924, it was announced that the investigation of Germany's military affairs had disclosed certain unsatisfactory conditions, and that, as a consequence, the evacuation of the Cologne area due under the Treaty on Jan. 10, 1925, provided Germany had lived up to the Treaty terms, would be postponed.

It was not until June 4 that Germany was apprised of the particulars in which she had offended. A note of that date from the Allies

demand, among other things, the abolition of the German general staff, the military police organization, secret military training of German youths, and experiments with poison gas; reduction of the security police; destruction of machinery for making war supplies, etc. The Germans agreed to all these demands in a note Nov. 11, 1925, and the evacuation of Cologne and other districts was accordingly ordered.

Early in the year 1925, Stresemann formally advanced the idea of a "security pact" to the Powers. It bore fruit finally in the Locarno Conference of October 5, which both Stresemann and Luther attended, and in the treaties agreed to there, which have been universally recognized as a landmark in European diplomatic history; but gratifying as the result might be to an impartial observer of European politics, the reaction among the Nationalists in Germany was one of intense opposition. The more chauvinistic of the Germans could not lightly give up the thought of redeeming German losses eventually through force of arms. Three Nationalist cabinet members resigned and the party went on record as opposed to the agreements, but the Socialists rallied to the support of the Government and on November 27 the treaties were ratified. On December 1, they were signed in London. Four days later, the Luther ministry resigned, as the Socialists refused to continue in its support. Once again there was a long interregnum between cabinets. On Jan. 19, 1926, Luther succeeded in forming a cabinet, but the jockeying for positions in it among the parties was so drawn out that President Hindenburg, with patience exhausted, issued a four-hour ultimatum to them to settle their differences with hints of a dictatorship if they failed.

Among the serious domestic questions with which the Government was called upon to deal was that of unemployment, which had reached large proportions. On Jan. 30, 1926, the evacuation of the Cologne district was finally completed and was celebrated by a tour of the region some weeks later by President Hindenburg. Although Germany's entrance into the League of Nations was a part of the Locarno understanding, the League was slow to act on her application for membership on February 8. The proposal to assign to Poland a permanent seat on the League Council when Germany was accorded that honor surprised the Germans, who refused to enter if that should be done. On April 26 a treaty between Germany and Russia was announced. Based on the Treaty of Rapallo, it provided that in case either country should be attacked by a third power or group of powers, the other would remain neutral, and also that neither would participate in an economic boycott against the other; but the point was expressly made that the agreement was not in conflict with Germany's obligations to be assumed when she entered the League of Nations. There was considerable objection to the treaty for a while among other European nations. By the time of the meeting of the League in September, all differences had been adjusted and Germany took her place as a member of the League with a permanent seat on the Council. See LEAGUE OF NATIONS.

The great success of the Locarno and League policies of Stresemann caused the opposition of the Nationalists to them and to the Government largely to subside; but the Luther cabinet nevertheless lived a precarious life and was

finally forced to resign, on May 12, because it had ordered that the old imperialist colors black, white, and red should be displayed by German representatives abroad beside the black, red, and gold of the Republic. With the Nationalists refraining from voting, this action was condemned in the Reichstag by a vote of 176 to 146. On May 17, Dr. Marx again became chancellor, retaining the whole Luther cabinet aside from the position of premier. The flag question was referred to a special commission, but continued for a long while to be a source of bitter contention. The issue that caused the greatest political upheaval in 1926, however, was whether the estates of Germany's former ruling houses should be confiscated for government uses. The question for years had been argued over in the courts, which for the most part had decided in favor of the royal owners. Early in 1926, a number of organizations united to force a national referendum, which under the constitution must be held if one-tenth of the qualified voters should demand it. Some 12,000,000 signatures, three times the necessary number, were obtained and after much delay the referendum was ordered for June 20. An exciting campaign was climaxed by a letter from President Hindenburg opposing confiscation. Although 14,441,000 votes were cast for confiscation and only 585,000 against, the measure was lost because the total vote fell short by nearly 5,000,000 of the necessary 50 per cent of the total registered vote.

On December 17, the Marx cabinet found itself in a minority in the Reichstag and resigned. The issues which brought about its downfall were the activities of Defense Minister Gessler and Minister of the Interior K  lz. Gessler had long been bitterly opposed by the Socialists, who charged that he was secretly training a big military force behind the mask of "athletic clubs" and like organizations with the object of restoring the monarchy and again challenging the Allies on the battlefield. K  lz was opposed because of the drastic manner in which he enforced the censorship law. Once more President Hindenburg was confronted with a political crisis over the year's-end. He took a decided stand, demanding that a cabinet should be formed which could be assured of parliamentary support, and which, moreover, would carry on the Stresemann foreign policies. He suggested a Centre coalition, but the cabinet as eventually formed by Dr. Marx was a combination of Centre and Right elements, with Gessler remaining as Minister of Defense. The four Nationalists included in it, although bound by a preliminary understanding that they would accept the Republic and the foreign policy of conciliation, caused many difficulties by utterances breathing the spirit of a combative German assertiveness.

The year 1927, however, proved a quiet one both at home and abroad. Some important legislation was passed, including a bill restricting overtime labor and another establishing labor courts. The most stirring event of political import was the sharp memorandum to the German government delivered on October 20 by Agent General Gilbert of the Dawes Plan Commission. In it, he stated that while he believed the Government was earnestly trying to meet its reparations obligations, economic disaster and the failure of the Dawes Plan were threatened unless the large unnecessary expenditures of the Government and the free negotiating of loans and ex-



pansion of credit were curbed. In its reply, the Government defended certain of the expenditures such as the increase of civil salaries, but confessed that the criticism of federal grants to the states was well founded. The note resulted in reforms looking toward greater economy, which Mr. Gilbert noted in his report for the year. He also recommended in his report the setting of a definite amount of reparations and the ultimate removal of outside financial supervision such as he was exercising. Germany made her reparations payment promptly in 1927, partly from loan and partly from current revenues, and likewise in 1928.

Early in 1928, it became growingly evident that the cabinet did not reflect the changed state of public opinion and that its usefulness as a governing body was almost nullified by internal disagreement. The only change made, however, was the substitution of Lieutenant General Wilhelm Groener for Dr. Otto Gessler, who had served continuously since 1919, as Minister of Defense. The government's support in the Reichstag grew ever weaker. On March 31, the President dissolved that body and elections were held on May 20. They resulted as was generally predicted, in a victory for the Left, but the extent of the swing in that direction came as a surprise. The Socialists gained 21 seats and led all other parties with 152, the Communists increased their number from 45 to 54, and the Nationalists dropped from 111 to 73. The result was taken as an emphatic indorsement of the Stresemann conciliation policy in foreign affairs, as that was the important issue in the election.

In accordance with this shift in public opinion, the Marx cabinet handed in its resignation on June 12 and the Socialist leader, Hermann Müller, finally succeeded in getting together a ministry to take its place. Five parties, the Socialists, the Democrats, the People's Party, the Bavarian People's Party, and the Centre, were represented. The cabinet, however, was admittedly a provisional one, intended to function while a stronger coalition among the republican parties was being cemented. The Reichstag passed a bill reducing income taxes, a general amnesty bill, and other measures of varying importance. Trade agreements were concluded in 1928 with South Africa, China, and several other countries.

On August 11, the tenth anniversary of the adoption of the Weimar constitution was celebrated with great enthusiasm. The year was marked by a falling off in trade and industrial activity, which brought in its train labor disturbances including a dock-workers' strike lasting for months, and in the latter part of the year a lockout of 250,000 metal workers in the Ruhr. The latter action was caused by a refusal of the employers to accept an arbitral award increasing wages. The Reichstag appropriated 20,000,000 marks for the relief of the workers, who finally returned to work on the basis of former hours and wages when both sides agreed to accept the decision of the Minister of the Interior, Dr. Severing. His award, announced December 21, was in the nature of a compromise, giving the workers increases of 1 to 6 pfennigs an hour and cutting down their working time by three hours a week.

Following the formation of the Müller government in the middle of 1928, the projected replacement by a strong coalition proved ex-

tremely difficult to effect. Continual antagonism between the parties concerned prevented a union on any political programme. In the meanwhile, the provisional cabinet became daily weaker in prestige and authority, even the Socialists themselves voting against their Chancellor on the question of building a new 9000-ton cruiser.

In the early months of 1928, the endless quarrels between parties brought the Government face to face with a crisis of a most serious nature. Of the four parties which were to form the coalition, the Socialists, Democrats, People's Party, and Centrists, the latter two, particularly the Centrists, seemed immovably recalcitrant. The Centrist representative in the cabinet was withdrawn on February 5 and the party later refused to meet the other three in a conference called by the Chancellor. The People's Party also, despite the pleas of its most prominent leader, Stresemann, refused to join the coalition unless its specific demands were met. There were many warnings, including one from the Chancellor himself, that the breakdown of parliamentary government was imminent, to be followed inevitably by the setting up of a dictatorship and the eclipse of Liberalism. Following a February crisis, however, the situation grew somewhat less tense and the Chancellor continued to govern with a "cabinet of personalities." During May 1-3 Berlin was agitated by May Day Communist riots in three different sections, in which the police fired on groups of rioters and other civilians. Twenty-four people were killed. It was freely charged that the action of the police was needlessly harsh and the danger of an uprising exaggerated.

The final settlement of Germany's most galling troubles, the reparations obligation and the occupation of German territory by Allied troops, was brought markedly nearer in the first part of 1929 by the conference at Paris of experts on reparations. Germany had never ceased to press, intermittently but urgently, for the liberation of the occupied regions. In 1928 she had been met by plain intimations that the question was tied up closely with that of reparations. With regard to the latter, Mr. Gilbert's statement that the total amount which Germany was to be called upon to pay should be definitely fixed came more and more to represent responsible opinion, and at the September meeting of the League a conference of experts to try to arrive at such a result was proposed. The Paris conference, meeting in February, 1929, ensued and after four months of labor, with success in doubt almost to the last, succeeded in framing an agreement. For Germany, it was considered a most auspicious event, and the harassed country could at last look forward to a time of release from the most hampering of the restrictions on her national life yet remaining from the Allied victory. This was followed by the conference of The Hague.

See BADEN; BAVARIA; PRUSSIA; SAKONY; SCHLESWIG; THURINGIA; WÜRTTEMBERG; LEAGUE OF NATIONS; NAVIES OF THE WORLD; REPARATIONS.

GEROULD, GORDON HALL (1877- ). An American philologist, born in Goffstown, N. H. He was a member of the faculty of Bryn Mawr College and after 1916 was professor of English language and literature at Princeton University. He is the author of *The North England Homily Collection* (1902), *Sir Guy of Warwick* (1905),

*Selected Essays of Fielding* (1905), *The Grateful Dead: The History of a Folk Story* (1908), *Saints' Legends* (1916), *Peter Sanders, Retired*, a novel (1917), *Youth in Harley*, a novel (1920), *Filibuster* (1924), *A Midsummer Mystery* (1925), and other works. In 1918 he was a captain in the United States Army.

**GEROULD, JOHN HIRAM** (1808- ). An American zoölogist, born at Stoddard N. H., and educated at Dartmouth College and at Harvard. He was instructor in zoölogy at Dartmouth (1894-1915), assistant professor (1915-1918) and professor (1918- ). Professor Gerould published articles in zoölogical journals on the development of sipunculids and holothurians, and on the genetics of butterflies and moths. He was joint editor of the *Journal of Morphology and Physiology*.

**GEROULD, KATHARINE FULLERTON** (1879- ). An American writer, born at Brockton, Mass., and educated at Radcliffe College. She was a reader in English at Bryn Mawr, 1901-10. In addition to many articles in magazines, she published *Vain Oblations* (1914), *The Great Tradition* (1915), *Hawaii, Scenes and Impressions* (1916), *A Change of Air* (1917), *Modes and Morals* (1919), a collection of essays; *Valiant Dust* (1923), a collection of short stories; *Conquistador* (1923), *The Aristocratic West* (1925), and other volumes. She was a frequent contributor to magazines.

**GERRY, PETER GOELET** (1879- ). A United States Senator, born in New York City, who was graduated from Harvard in 1901. He was admitted to the Rhode Island bar in 1906, was a delegate from Rhode Island to the Democratic National Conventions of 1912 and 1916, and was a member of Congress for the Second Rhode Island District in 1913-15. He was elected U. S. Senator for the two terms (1917-29).

**GEST, MORRIS** (1881- ). A theatrical producer born in Vilna, Russia. He came to the United States in 1893 and was educated in the public schools of Boston. He began his theatrical business in Boston and since 1905 has been a member of the firm of F. Ray Comstock & Morris Gest in New York. This firm has produced more than 50 plays. Among its most notable successes are *Experience* (1914), *The Wanderer* (1917), *Chu Chin Chow* (1918), *Aphrodite* (1919), and *Mecca* (1920). Balieff and his Chauve-Souris artists were presented to the American public by this management (1922), the Moscow Art Theatre (1923), and the Freiburg Passion Play (1929). During the 1923-24 season, it produced *The Miracle* under Max Reinhardt's direction and plays starring Eleonora Duse, and Sir John Harvey. In 1926 the firm contracted with the United Artists to produce one motion picture annually for six years, beginning with Belasco's *The Darling of the Gods*.

**"GESTALT" PSYCHOLOGY.** See PERCEPTION; PSYCHOLOGY.

**GHENT, gent.** A seaport and manufacturing city of Belgium. The population in 1927 was 103,207. A network of canals form of the city a second Venice, the 26 islands being connected by 60 bridges. The commerce of Ghent is mostly with England, North America, and South America, the city being connected with the seaports of Ostend and Zeebrugge by one of the largest canals in the world. In 1922, 1858 vessels of 1,308,197 tonnage were cleared. Ghent is the principal centre of the Belgian textile industry.

The factories, however, are confined to the suburbs and are not allowed to settle in the city. One of the most important unions is the socialist coöperative society, *De Vooruit*, which corresponds to the powerful guilds of the fourteenth and fifteenth centuries. Ghent is also a horticultural centre, and its flower shows, which are held every five years, have an international reputation. The University of Ghent is a state institution. In 1923 a law was passed declaring that the instruction in the faculties of philosophy and letters, law, science, and medicine should be in both French and Flemish. The Germans, during their occupation of Ghent from October, 1914 to November, 1918, professedly sympathized with the Flemings and, as part of their propaganda in achieving a partition of Belgium, urged the conversion of the university into a Flemish institution.

**GHEON, gǎ'ôn, HENRI** (1875- ). Pseudonym of Henri-Léon Vangeon, a French poet and playwright born at Bray-sur-Seine, near Provins. His pre-war plays, *Le Pain* and *L'Eau de Vie*, were produced in Paris, and his other works include *Algérie*, poems, and *Nos directions*, criticisms. He described his conversion to Catholicism during the World War in *L'Homme né de la Guerre*, (4 ed., 1919). After the War, he founded the Compagnons de Notre Dame to present miracle and religious plays. Gheon wrote or adapted the plays, which included *Les Trois Miracles de Sainte Cécile* (1918); *Le Pauvre sous l'escalier* (1919); *Les Aventures de Gilles, ou le Saint Malgré Lui* (1921); *La Bergère au Pays des Loups* (1922); *La Merveilleuse Histoire du Bernard de Menthon*, played at the Chateau de Menthon in Savoy (1923); *Le Triomphe de Saint Thomas d'Aquin* (1925); *La Vie profonde de Saint François d'Assise* (1926), and *Les trois Sages du vieux Wang* (1927).

**GIBBONS, FLOYD (PHILLIPS)** (1887- ). An American journalist and war correspondent, born at Washington, D. C., and educated at Gonzala College and Georgetown University. In 1907 he entered the newspaper field as a staff member of the Minneapolis *Daily News*, later joining the staff of the Milwaukee *Free Press* and the Minneapolis *Tribune*. In 1912 he joined the Chicago *Tribune*. In 1917 he was London correspondent for the Chicago *Tribune* and a year later went as war correspondent to France, where he was wounded in the Battle of Château-Thierry. He was awarded the French and Italian Croix de Guerre. After the Armistice, he became foreign director of the Chicago *Tribune* and editor of the European edition published in Paris.

**GIBBONS, HERBERT ADAMS** (1880- ). An American author, born at Annapolis, Md., and educated at the William Penn Charter School in Philadelphia, the University of Pennsylvania, and Princeton Theological Seminary. He was ordained in the Presbyterian ministry in 1908, and until 1919 was correspondent in Turkey and in Europe for various American periodicals. From 1910 to 1913, he was professor of history and political economy in Robert College, Constantinople, and in 1919 was named honorary associate professor in the Army War College, Washington D. C. His publications include *The New Map of Europe* (1914); *The Foundation of the Ottoman Empire* (1915, 1921); *The New Map of Africa* (1916); *Reconstruction of Poland and the Near East* (1917);

*The New Map of Asia* (1919); *Venizelos* (1920, 1923); *Bases of Anglo-Saxon Solidarity* (1921); *Lithuanian Recognition* (with W. G. McAdoo; 1921); *An Introduction to World Politics* (1922); *Europe Since 1918* (1923); *America's Place in the World* (1924); *A Selected Bibliography of the World War* (1924); *Ports of France* (1926); *Life of John Wanamaker* (1926); *Europe of To-day* (1927).

**GIBBS, SIR PHILIP** (1877- ). An English writer and newspaper correspondent, who was educated privately. After four years of editorial work, he entered journalism (1902), acting first as literary editor for various papers, and then special correspondent for the *Daily Chronicle*. He served as war correspondent with the Bulgarian Army (1912), with the French and Belgian armies (1914), and with the British Armies in France (1915-18), where he reported field operations. In 1920 he was knighted, and from 1921 to 1922, he edited the *Review of Reviews*. He frequently visited and lectured in the United States. His writings include the novels *Oliver's Kind Women* (1912), *Back to Life* (1920), *Venetian Lovers* (1922), *The Middle of the Road* (1922), *Heirs Apparent* (1923), *The Reckless Lady* (1925), *Young Anarchy* (1926), *Out of the Ruins* (1927), and *The Age of Reason* (1928); the historical works, *Men and Women of the French Revolution* (1906), *George Villiers, First Duke of Buckingham, and Some Men and Women of the Stuart Court* (1908), *King's Favorite* (1909), *Adventures of War with Cross and Crescent* (1912), *The Soul of War* (1915), *The Battles of the Somme* (1917), *People of Destiny; Americans as I saw them at Home and Abroad* (1920), *Now it Can be Told* (1920), and *More That Must be Told* (1921); and the essays *The Eighth Year* (1913), *The New Man; a Portrait Study of the Latest Type* (1913), *Adventures in Journalism* (1923), *Ten Years After: a Reminder* (1924), *Knowledge is Power; a Guide to Personal Culture* (1925), and *The Day After To-morrow; What is Going to Happen to the World?* (1928).

**GIBNEY, VIRGIL PENDLETON** (1847-1927). An American pioneer orthopedic surgeon, born in Jessamine County, Kentucky. He received his degree in arts at the University of Kentucky (1868) and in medicine at Bellevue Hospital Medical College (1871). He entered the Hospital for Ruptured and Crippled, New York, as resident house surgeon, becoming chief surgeon in 1887. He was professor of orthopedic surgery at the New York Polyclinic (1882-1894) and during the rest of his career taught the same subject at the medical department of Columbia University, where he was successively clinical lecturer, clinical professor, and full professor. He resigned in 1917. He was the first president of the American Orthopedic Association and his textbook on *The Hip and Its Diseases* (1884) went through numerous editions.

**GIBSON, CHARLES DANA** (1867- ). An American illustrator (see VOL. IX). During the World War, he did some notable work as cartoonist. Later, he purchased a controlling interest in *Life*, of which he assumed entire charge in April, 1920.

**GIBSON, HUGH** (1883- ). An American diplomat, born at Los Angeles, Calif., and educated for the diplomatic service at the École Libre des Sciences Politiques at Paris. Between 1908 and 1919, he held various diplomatic posts in Central America, England, Belgium, and

France, and was a member of special committees or missions in Washington, Santo Domingo, and the countries of the former Austro-Hungarian Empire. In 1918-19 he served with Herbert Hoover in European relief work. In the latter year, he was named first Minister to Poland. He was Minister to Switzerland, 1924-27, and became Ambassador to Belgium in 1927. In 1926-27 and in May, 1929, he was chairman of the American delegation to the preparatory commission for the Disarmament Conferences at Geneva. He was also chairman of the American delegation to the Conference for the Limitation of Armament in 1927 and chairman of the conference. He published *A Journal from Our Legation in Belgium* (1917).

**GIDE, zhéd, ANDRÉ** (1869- ). One of the leading French writers of the twentieth century, born in Paris and educated in the École Alsacienne and the Lycée Henri IV. He began publishing in his twenty-first year. When he wrote his *Nourritures Terrestres* (1897), a collection of prose poems, he was acclaimed as an intellectual poet of the first order. As a novelist and an intellectual essayist, Gide showed himself a master of psychological observation, in many ways resembling Dostoevski. After the World War, he was among the first to demand the resumption of intellectual relations with Germany and engaged in a polemic against nationalistic writers like Barrès and Maurras. His works include: *Philoctète* (1890); *Cahiers d'André Walter* (1891); *Poésies d'André Walter* (1892); *La tentative amoureuse* (1893); *Paludes* (1895); *Prétextes, essays* (1895); *Saül* (1898), played at the Théâtre du Vieux Colom-bier in 1922; *Prométhée mal enchaîné* (1899); *L'Immoraliste* (1902); *Amyntas, travel in Algeria* (1906); *Le retour de l'enfant prodigue* (1907); *Dostoevski* (1908); *La porte étroite*, translated as *Straight is the Gate* in 1924 (1909); *Oscar Wilde* (1910); *Nouveaux prétextes* (1911); *Les caves du Vatican* (1914); *La symphonie pastorale* (1919); *Morceaux choisis* (1922); *Incidences, essays* (1924); *Les fauconniers* (1925); *Numquid et tu!*, miscellany (1926); *Voyage au Congo* (1927); and *Le retour du Tchad* (1928). He translated *Gitanjali* (L'offrande lyrique) of Tagore (1913), Shakespeare's *Antony and Cleopatra* (1921), and Blake's *Marriage of Heaven and Hell* (1923). Consult *Bibliographie de l'œuvre d'André Gide, 1891-1924*, by Raoul Simonson (1924); *Portraits and Sketches*, by Edmund Gosse (1912); "The novels of André Gide," by Francis Bickley in *Life and Letters* (London) vol. ii, p. 83-90 (1924), and *André Gide, son œuvre* by G. Gaboury (1924).

**GIDE, CHARLES** (1847- ). A French political economist (see VOL. IX), a professor at the Collège de France. An independent thinker on economic questions, Gide stimulated interest in economics as an art of social administration rather than as a science of the status quo. His *Histoire des Doctrines Économiques* (1909-22), written with M. Rist, contained a penetrating criticism of the communist experiment in Russia. His later works include *Premières Notions d'Économie Politique* (1921); *De l'intervention des pouvoirs publics pour la réalisation du juste prix* (1922); *La Russie soviétique* (1924); *Les douze vertus de la coopération* (1925), and *Fourrier, précurseur de la coopération* (1925). He also published many of his lecture courses at the Collège de France.

**GIESE**, gē'zē, WILHELM OSKAR FRITZ (1890- ). A German psychologist and author. He studied philosophy, psychology, and medicine and is connected with a sanitarium near Halle. Among his principal recent works are *Kulturwende* (1916), *Der Romantische Charakter* (1919), *Psychologisches Wörterbuch* (1920), *Psychologische Normung* (1920), *Wesen und Ziele der Psychotechnik* (1920), *Das ausserpersönliche Unbewusste* (1924), *Körperseele* (1924), *Geist im Sport* (1925), and *Die Frau als Atmosphärenwert* (1926).

**GIESEKING**, WALTER (1895- ). A German pianist, born at Lyon, France, and trained at the Hanover Conservatory. After winning recognition as an excellent interpreter of the classics, he espoused the cause of the modernists. Since 1926 he has been on concert tours with great success in the United States.

**GIGLI**, BENIAMINO (1890- ). A celebrated Italian dramatic tenor, born at Recanati. After completing his studies under Enrico Rosati at the Liceo Santa Cecilia, in Rome, he made his debut as Enzo in *La Gioconda*, at Rovigo (Oct. 15, 1915), with striking success, so that within the next three years he won triumph after triumph at the principal Italian opera houses. Then followed tours of Central and South America. On Nov. 26, 1920, he was heard at the Metropolitan Opera House, in New York, as Faust, and since then he has been a regular member and prime favorite there, succeeding to many of the principal roles of Caruso after the latter's death in 1921.

**GIL**, PORTES. President of Mexico, see **PORTES GIL**.

**GILBERT**, ARTHUR WITTER (1882- ). An American agronomist, born at West Brookfield, Mass., and educated at the Massachusetts Agricultural College and Boston University. He was instructor and assistant professor of agronomy at the University of Maine, 1905-07, assistant professor and professor of plant breeding at Cornell, 1909-17, agricultural secretary to the Boston Chamber of Commerce, 1917-19, and Commissioner of Agriculture of Massachusetts, 1919- . He is the author of *Plant Breeding*, with L. H. Bailey (1914), and *The Potato* (1917). He edited *Food Supply of New England* (1923).

**GILBERT**, SEYMOUR PARKER (1892- ). An American lawyer who served as Agent General for Reparation Payments. He was born at Bloomfield, N. J., was graduated at Rutgers College (1912), and obtained the degree of LL.B., *cum laude*, from Harvard in 1915. He practiced law in New York City for three years. During and after the World War, he was a member of the war-loan staff in the office of the Secretary of the Treasury. He became Assistant Secretary of the Treasury, in charge of fiscal affairs, in 1920 and was reappointed in March, 1921, with the change of administration. From July 1, 1921, to Nov. 17, 1923, he was Under-Secretary of the Treasury, but resigned to reënter law practice with the firm of Cravath, Henderson & de Gersdorff in New York. From 1924 to 1929, he was Agent General for Reparation Payments of Germany under the Dawes Plan. In 1927 he issued a warning to Germany on the rise of military expenditures, which had a pronounced effect in determining the national budget and facilitating reparation payments to the Allies during the operation of the Dawes Plan. See **REPARATIONS**.

**GILBERT AND ELLICE ISLANDS COLONY**. See **PACIFIC ISLANDS**.

**GILBRETH**, FRANK BUNKER (1868-1924). An American consulting engineer (see Vol. IX). In July, 1917, he became commanding major of engineers, and in December of the same year was on duty at the General Staff College in Washington. Among his later writings are *Applied Motion Study* (1917), *Motion Study for the Handicapped* (1919), and papers on the education of the crippled soldiers.

**GILES**, jīlz, HERBERT ALLEN (1845- ). An English Orientalist (see Vol. IX), professor of Chinese at Cambridge University. In 1924 he was elected to the French Academy, and received the honorary Litt.D. from Oxford. Besides works on the Chinese language, he wrote "China," in *History of the Nations* (1913); *Adversaria Sinica* (1914-15); *Confucianism and Its Rivals* (1915); *The Travels of Fa-hsien* (1923); *Some Truths about Opium* (1923); *Chinese Poetry in English Verse* (1898, enlarged ed., 1923); *Chaos in China* (1924); *The Hsi Yuan Lu* (Chinese Instructions to Coroners, 1924), and *Quips from a Chinese Jest-Book* (1925).

**GILLETT**, FREDERICK HUNTINGTON (1851- ). An American Congressman and United States Senator, born at Westfield, Mass., and educated at Amherst College and the Harvard Law School. He began the practice of law in Springfield in 1877. He was assistant attorney general of Massachusetts, 1879-82. For two terms he was representative in the Massachusetts House, and from 1893 to 1925 served as Representative in Congress. In 1914 he favored the Panama Canal Tolls Repeal Bill and was distinctly opposed to the Government's Mexican policy. In May, 1919, he was elected Speaker of the House and served in this capacity until 1925, when he was elected United States Senator for the term 1925-31.

**GILLOUIN**, RENÉ CHARLES AUGUSTE (1881- ). A French philosophical writer who was born at Aouste, Drôme, and educated at the École Normale Supérieure. He entered the municipal administration of Paris and was attached to the cabinet of the president of the city council. As a writer, his affinities were with the nationalist Catholic school and the ideology of Bergson and LeRoy. His works include *Ars et Vita*, *Études Littéraires et Philosophiques*, *La Philosophie de M. Henri Bergson* (1911); *Idées et figures d'aujourd'hui*, and *Une nouvelle philosophie de l'histoire moderne et française*. Three of these received the prizes of the French Academy for literature and criticism. He was editor of *Politica*, a library of works on political thought and action.

**GILSON**, ÉTIENNE HENRY (1884- ). A French professor and philosophical writer, born in Paris and educated at the Sorbonne. He taught in the lycées of Bourges, Tours, and Angers, and in the universities of Lisie, Strasbourg, Harvard, and Paris, and edited *Études de philosophie médiévale*, and *Archives d'histoire doctrinale et littéraire du moyen âge* (1926-27). As a scholar, Gilson was best known by his researches in mediæval philosophy. His writings include a doctoral dissertation on *La Liberté chez Descartes et la Théologie* (1912); *Études de philosophie médiévale* (1921); *La Philosophie au Moyen Âge*, 2 vols. (1922); *Le Thomisme* (1923); and *La Philosophie de Saint Bonaventure* (1924).

**GINZKEY, FRANZ KARL** (1871- ). An Austrian author, born at Pola in Istria, and educated at the Marine Academy and Cadet School. After serving as officer in various Austrian towns, he was appointed technical director of the Military-Geographical Institute in Vienna. Later, he went to Salzburg and devoted himself to writing. In 1906 and 1920, he was awarded the Bauernfeld Prize. His later works include *Von wunderlichen Wegen*, stories, (1921); *Rositta*, a novel, (1922); *Vom Gastmahl des Lebens*, poems, (1922); *Es war einmal*, ballads (1922); *Balladen aus dem alten Wien* (1922); *Die Reise nach Konakuku*, stories, (1923); *Der Weg zu Oswalds*, story, (1924); *Brigitte und Regine*, poem, (1924); *Der seltsame Soldat* (1925); *Der Kater Ypsilon* (1926); *Der Gott und die Schauspielerin*, stories, (1927). He edited *Die Romantik der Weltliteratur*.

**GIOLITTI, jò-lét-tè, GIOVANNI** (1842-1928). An Italian statesman (see VOL. IX). When the World War broke out, he was in favor of strict neutrality, and when the question of Italian participation arose in 1915, he attempted unsuccessfully to overthrow the Salandra cabinet. Throughout the course of the War, he was looked on as a "defeatist." After the Armistice, he again returned to the premiership (May, 1920-April, 1921). His foreign policy was successful, but his internal programme was dominated first by the Socialists and later by the Fascists. He was a moderate opponent of the Fascist regime, favoring Parliamentary government. In 1922 he published *Memoires of My Life* in 2 vols. See ITALY, under *History*.

**GIRAUDOUX, zhër'ò-doo', HIPPOLYTE JEAN** (1882- ). A French man of letters, born at Bellac (Haute-Vienne), educated at the École Normale Supérieure. Following his graduation, he devoted himself in turn to teaching journalism, and to diplomacy. In the meantime, he began his literary career as a writer of poems in prose, and his first book, *Les Provinciales* (1909) won immediate recognition. His *Lectures pour une Ombre* (1917) was one of the few war books and of literary merit, *Siegfried et le Limousin* (1922), a war story of shell shock and amnesia, was one of the books awarded the Grand Prix Balzac. His other works include; *Simon le païhétiqne* (1918); *Amica America* (1918); *Elpénor*; *Adorable Olio* (1920); *Suzanne et le Pacifique* (1921); *Finale de Siegfried et le Limousin* (1922); *Juliette au pays des hommes* (1924); *Bella* (1926); *Eglantine* (1927), and *Siegfried*, a dramatization of *Siegfried et le Limousin*, (1928).

**GIRL SCOUTS.** A national organization for girls, founded in 1912, to develop initiative, self-control, self-reliance, and service to others, and to meet a fundamental need for recreation and education in the lives of young girls. The unit of the organization is the troop which is composed of one or more patrols, each consisting of six to eight girls. The activities of the troop are directed through the patrol system, and the Court of Honor which is made up of the patrol leaders, the captain, and lieutenants. Membership is open to girls between 10 and 18 years who are willing to subscribe to the Girl Scout Promise and Laws and who have passed the necessary test. During the World War, the Girl Scouts entered into and initiated many forms of war service. No records were kept of their activities in the first two Liberty Loan campaigns, but in the third, they sold 12,742

bonds, amounting to \$3,151,000, and in the fourth campaign they practically doubled this figure, in the sale of 39,987 bonds, valued at \$6,123,550. The War over, they turned to peace-time activities, such as home-making, the underlying idea of which is to develop beauty and simplicity, as well as utility, in the home, and to raise the standards and ideals of the American homes of the future. Twelve national summer training schools for leaders were established, to train girls for leadership work, through the Laura Spelman Rockefeller Memorial, by a contribution from the Julius Rosenwald Fund. Training in leadership was also given in more than 30 colleges throughout the country, and summer camps were conducted for younger girls to train them in the habits necessary for later life and to give them an opportunity for out-of-door living. The total active membership of the organization, according to the annual report of Dec. 31, 1928, was 190,309, or 22,384 more than in the previous year, and there were 22,622 volunteer leaders.

**GISH, DOROTHY** (1898- ). An American motion-picture actress, born in Dayton, Ohio, sister of Lillian Gish. She appeared on the stage from childhood. Her best-known pictures are *Old Heidelberg*, *Stage Struck*, *The Little Yankee*, *Children of the Feud*, *That Colby Girl*, *Hearts of the World*, *Battling Jane*, *The Hope Chest*, *Orphans of the Storm*, *Romola*, *Nell Gwyn*, and *Madam Pompadour*. In 1920 she married James Rennie, an actor.

**GISH, LILIAN** (1896- ). An American motion-picture actress, sister of Dorothy Gish, born in Springfield, Ohio. She appeared on the legitimate stage at the age of five and after 1913 played in motion pictures. Her best characterizations were in *The Birth of a Nation*, *A House Built on the Sand*, *Souls Triumphant*, *Hearts of the World*, *The Greatest Thing in Life*, *Broken Blossoms*, *Way Down East*, *Orphans of the Storm*, *The White Sister*, *Scarlet Letter*, *Annie Laurie*, *The Wind*, and *The Enemy*.

**GLACIAL CONDITIONS.** See GEOLOGY.

**GLACKENS, WILLIAM J.** (1870- ). An American painter and illustrator (see VOL. X). At the Panama-Pacific International Exposition, 1915, he was awarded a bronze medal and in 1924 he was awarded the Temple Gold Medal. In his later work, continuing his interest in the more colorful aspects of life, he maintained his reputation as a remarkable colorist.

**GLAND.** See SECRETIONS, INTERNAL; Zoology, under *Physiology*.

**GLASGOW.** The principal commercial centre of Scotland. The population rose from 784,496 in 1911 to 1,034,174 in 1921; in 1928 the estimated population was 1,160,500. The municipal area is 29,511 acres. The city is governed by a town council of 113 members and sends 15 members to Parliament. Glasgow's trade in 1924 was valued at £85,302,000. In 1926 the tonnage of ships entering was 6,677,722 and of ships cleared, 6,568,831. The work in connection with the raising of the level of Loch Katrine, so as to augment the city's water supply, was in progress for several years. At the end of 1926, the structural works at the outlet dam at the Trossachs end of Loch Katrine and also at the inlet basins to the two aqueducts were completed, and the water was raised to a level of 14 feet 6 inches. More than £5,000,000 has been expended on this service. In 1923 the corporation purchased the Glasgow Subway Railway, opened by private enterprise in 1896, for £385,000 and has spent a large sum



of money on substituting electric for cable traction. In 1923 an extension was added to the municipal building, and in 1927 the George V Bridge was opened so as to meet the demands of traffic. The People's Palace, combining a winter garden, art gallery, museum, and concert hall, was built by the corporation in the east end of the city. The city meets most of its expenses out of a fund known as the Common Good Fund, which has been accumulating for 350 years. The assets of this fund amount to more than £10,000,000. It is largely used to further municipal culture, education, and charity.

**GLASGOW, ELLEN ANDERSON GHOLSON** (1874- ). An American novelist (see Vol. X). Her later works included *Life and Gabriella* (1916); *The Builders* (1919); *One Man in His Time* (1922); *The Shadowy Third* (1923); *Barren Ground* (1925); *The Romantic Comedians* (1926); *They Stooped to Folly* (1929).

**GLASPELL, SUSAN** (MRS. GEORGE CRAM COOK) (1882- ). An American author (see Vol. X). She wrote *Fidelity* (1915); *Trifles*, with George Cram Cook (1917); *Suppressed Desires* (1917); *Plays*, a collection including "Bernice" (1920); *Inheritors* (1921); *Verge* (1922); *The Road to the Temple* (1926); *The Comic Artist* (Collaboration, 1927); and *Brook Evans* (1928).

**GLASS.** See **CHEMISTRY, APPLIED.**

**GLASS, CARTER** (1858- ). A United States Senator, born at Lynchburg, Va., and educated at public and private schools there. For eight years, he worked in a printing office and subsequently became owner of the *Daily News* and the *Daily Advance* of his native town. He served in the Virginia Senate from 1899 to 1903, and in the latter year, on the death of P. J. Olney, he became a member of the United States Congress, to which he was continuously reelected until 1918, when he resigned to become Secretary of the Treasury in President Wilson's cabinet. Here he was active in floating the Victory Loan. He resigned a year later (November, 1919), and was appointed and later elected to fill the unexpired term of Senator Thomas S. Martin, deceased. He was reelected for the term 1925-31. Although an advocate of prohibition, he supported Alfred E. Smith in the Presidential campaign of 1928, in which Virginia went Republican. In 1920 he was chairman of the committee on resolutions at the Democratic National Convention. As chairman of the House banking commission, he sponsored and was largely responsible for the Federal Reserve Act.

**GLASS, MONTAGUE (MARSDEN)** (1877- ). An American author, born at Manchester, England, and educated at the College of the City of New York and New York University. Among other works, he is the author of *Potash and Perlmutter* (1913), a successful farce, written in collaboration with Charles Klein. With J. E. Goodman (q.v.) he wrote: *Object: Matrimony* (1916); *Business before Pleasure* (1917); *Why Worry?* (1918); *His Honor, Abe Potash* (1919). Other plays are *Potash and Perlmutter—Detectives* (1926), and *Lucky Numbers* (1927).

**GLAZEBROOK, SIR RICHARD TETLEY** (1854- ). An English physicist (see Vol. X). He was Zhabaroff professor of aviation and director of the department of aeronautics in the Imperial College of Technology (1920-23) and after 1926 foreign secretary to the Royal Society. He added to his works *Science and Industry* (1917).

Knighted in 1917, he was made a Knight Commander of the Bath in 1920.

**GLEAVES, ALBERT** (1858- ). An American naval officer, born in Nashville, Tenn., and educated at the United States Naval Academy. During the Spanish-American War, he commanded the torpedo boat *Cushing* and from 1904 to 1908 he was in charge of the torpedo station at Newport, R. I. In 1915 he took command of the destroyer force of the Atlantic fleet. In 1917 he had charge of convoy operations on the Atlantic and conveyed the first contingent of the American Expeditionary Force to France. From 1917 to 1919, he commanded the cruiser and transport force of the Atlantic fleet, and from 1919 to 1921, commanded the Asiatic station, and in 1922 the First Naval District and the Navy Yard in Boston. He was retired by operation of law in 1922. He was appointed rear admiral in 1915, vice admiral in 1918, and admiral in 1919. He wrote *Capt. James Lawrence, U. S. N.* (1904), *History of the Cruiser and Transport Force* (1921), *Life of an American Sailor—William Hemsley Emory* (1923), and *Life and Letters of Rear Admiral S. B. Luce, U. S. N.* (1925).

**GLENN, MARY WILLCOX** (MRS. JOHN M. GLENN) (1869- ). An American social worker, born in Baltimore, Md. From 1897 to 1900, she was executive secretary of the Henry Watson Children's Aid Society of Baltimore. In 1900 and 1901 she served as general secretary of the Charity Organization Society of Baltimore and in 1915 was appointed president of the National Conference of Charities and Corrections. In July, 1928, she was chairman of Section III on social case work of the International Conference on Social Work at Paris. She was president and director in many other social organizations and was the author of *Development of Thrift* (1899).

**GLENN, OLIVER EDMUNDS** (1878- ). An American mathematician and educator, born in Moorefield, Ind., and educated at Indiana and Pennsylvania universities. In 1902-03 he served as instructor at the University of Indiana and afterward was acting professor of mathematics at Drury College. In 1906 he was a member of the faculty of the University of Pennsylvania as instructor in mathematics, assistant professor, and after 1914, professor. He was a member of several scientific societies and the author of *A Treatise on the Theory of Invariants* (1915) and mathematical memoirs.

**GLENO DAM FAILURE.** See **DAMS.**

**GLIDERS.** See **AERONAUTICS.**

**GLOVES.** See **LEATHER.**

**GOBLET D'ALVIELLA, gôblâ' dâl-vyél'la,** COUNT EUGÈNE (1846-1925). A Belgian legislator, writer, and minister of state (see Vol. X). During the World War, he was a member of the Belgian cabinet. He published *The True and the False Pacifism* (1917). He was killed in an automobile accident. His will founded the Prix Goblet d'Alviella to be given every five years to the Belgian who wrote the best scientific work on the history of religions.

**GOBLOT, gôblô', EDMOND** (1858- ). A French logician and philosopher of science, a member of the Lyons Faculty of Letters. In his *Essai sur la classification des sciences* (1898), he sought to continue the tradition of positive rationalism inherited from Comte and Cournot. This project he carried out more fully in his later works, *Traité de Logique* (1918) and *Le*

*Système des Sciences: le Vrai, l'Intelligible, et le Réel* (1922). The rationalism expounded in these works was in direct contrast to the tendency of the school of Bergson toward æsthetic mysticism. Goblot was also the author of *Vocabulaire Philosophique* (1901), *Les Théories d'Einstein* (1922), and *La logique des jugements de valeur* (1927).

**GODDARD, HENRY HERBERT** (1866- ). An American psychologist known for his research in feeble-mindedness. He was born in Vassalboro, Me., and educated at Haverford College. After a period of school-teaching, he was appointed professor of psychology at the State Normal School of Pennsylvania. In 1906 he resigned to take charge of the bureau of research in the Training School for the Feeble-minded at Vineland, N. J. After 12 years in this capacity, he was made director of the State Bureau of Juvenile Research, of Ohio, and in 1922 he became professor of abnormal and clinical psychology in the Ohio State University. His major publications comprise *The Kallikak Family* (1912); *Feeble-mindedness: Its Causes and Consequences* (1914); *The Criminal Imbecile* (1915); *Psychology of the Normal and Subnormal* (1919); *Human Efficiency* (1920); *Juvenile Delinquency* (1921); *Two Souls in one Body?* (1927), and *The School Training of Gifted Children* (1927).

**GODFREY, HOLLIS** (1874- ). An American educator and engineer, born in Lynn, Mass., and educated at Tufts College and Harvard University. From 1898 to 1905, he was engaged in teaching and from 1906 to 1910 was head of the department of science of the School of Practical Arts in Boston. He was consulting engineer for several cities and corporations and was research worker for the New York State Commission on Hygiene from 1910 to 1917. He was president of the Drexel Institute in Philadelphia from 1913 to 1921, and after 1921 was president of the Engineering Economics Foundation. He wrote *The Man Who Ended War* (1908); *The Health of the City* (1910); *Dave Morrell's Battery* (1912), and *Creating Wealth* (1927), as well as contributions to periodicals.

**GOETHALS, gôthals, GEORGE WASHINGTON** (1858-1928). An American civil and military engineer (see VOL. X). He resigned from the post of Civil Governor of the Canal Zone in 1916 and was made chairman of the board of inquiry in regard to the Adamson Eight-hour Railway Labor Law. He was State engineer of New Jersey in 1917 and in the same year was made general manager of the Emergency Fleet Corporation. Because of his lack of faith in the wooden fleet, he resigned after three months. He was then appointed acting quartermaster general of the United States Army. In 1918 he was made chief of the division of storage and traffic of the general staff (in February) and chief of the division of purchase, storage, and traffic (in April). He was also a member of the War Industries Board. At his own request, he was relieved from active service in March, 1919, and later headed an engineering and construction company. He retired from this work several months before his death. General Goethals was associated with the Port of New York Authority for several years, and had much to do with the planning of the Holland tubes under the Hudson River between New York and Jersey City, and with plans for the bridge between New York and Fort Lee, N. J. In 1915 the Congress of the

United States thanked him formally, in behalf of the nation, for "distinguished service in constructing the Panama Canal," and he received the Distinguished Service Medal in 1918 for "especially meritorious and conspicuous service" in reorganizing the quartermaster department. In 1919 France made him a commander of the Legion of Honor.

**GOITRE.** Examination of United States recruits during the World War showed a considerable percentage of cases of this affection. In one group of 20,000, no less than 6 per cent showed simple goitre in a considerable degree. It also became evident that this affection is endemic in certain areas, such as the belt which runs south of the Great Lakes. It is here that most of the intensive study and attempts at prevention have taken place. Thus in the school children of Akron, Ohio, goitre is known to develop in a considerable number, and it was learned that the addition of a few milligrams of iodine to the daily diet was a preventive. At Rochester, N. Y., the city water supply was medicated with iodine with the desired result of preventing the development of the disease.

The problem of prevention is complicated in France, Switzerland, and India, where the disease has been endemic for centuries with a high incidence. Here other factors may be at work in determining the disease, and the mere addition of a little iodine to the food or water may be insufficient for prevention. The iodine ingested by the patient may not be absorbed as a result of an abnormal condition of the intestine. Similarly, there may be some irregularity in regard to the metabolism of iodine, or it may be too rapidly eliminated. The preventive action of iodine has, however, been demonstrated in school children in Switzerland, and it has been shown likewise that regions of high altitudes, remote from the ocean, may not contain enough iodine in their plant foods and water to prevent the development of the disease. Simple goitre must not be confused with toxic goitre or Graves's disease. In this form, there is not much enlargement of the thyroid, but the patient is an invalid who suffers much from rapid pulse and nervousness.

The First International Congress on Goitre was held at Berne Aug. 24-26, 1927, and, while practically all countries sent delegates, some of the leading authorities on the disease failed to attend. The very large number of exhibits are to be used as the nucleus for a future goitre museum. It is difficult to sum up the results of the Congress, but there is evidently a great lack of standardization and uniformity in various aspects of the disease including the nomenclature. It is by no means certain that the problem of goitre is the same in different localities. Lack of iodine as a causal element seems to recede despite its use in prevention. The preventive campaign as carried out in the United States is being carried out in a number of European countries consisting chiefly in the use of iodine but too much should not be expected of it as a cure. Mild cases may disappear but the severe forms are merely improved and we should not look forward to eradicating the disease in this simple manner. See **FOOD and NUTRITION**.

**GOLD.** The World War, with its intensive economic changes and dislocation of values, produced a depression in the gold-mining industry that had not been completely overcome 10 years after the signing of the Armistice. Subsequent

to the war period, certain mines, such as those in South Africa and Australia, were able to produce gold with considerable advantage, as they received a virtual premium on their output; but, with the strengthening of sterling exchange, their position became less satisfactory. In the United States, there has been no such advantage. The increased costs of labor and supplies has been ac-

PRODUCTION OF GOLD IN THE WORLD  
CALENDAR YEARS 1910-28  
BUREAU OF THE MINT

Calendar years	Value
1910	\$455,289,100
1911	461,980,500
1912	466,136,100
1913	459,913,820
1914	439,170,642
1915	468,799,812
1916	454,260,242
1917	419,520,457
1918	383,734,482
1919	365,853,933
1920	337,004,255
1921	330,231,792
1922	319,420,000
1923	369,716,000
1924	388,309,000
1925	389,251,000
1926	398,557,000
1927	402,844,000
1928	408,808,256

companied by a reduction in the grade of ore at many of the primary gold producers. This condition has resulted in numerous requests for government assistance in the form of the establishment of a bounty on production or an excise tax to be based on gold used in the arts. However, no action was taken on these suggestions. In the United States, gold mining has been discouraged by the maintenance of the high commodity price level and the failure of the Government to offer legislative assistance. Consequently, an increasing proportion of the gold produced in the United States is secured as a by-product from the production of the more important non-ferrous metals, particularly copper.

PRODUCTION OF GOLD IN THE UNITED STATES  
CALENDAR YEARS 1910-28

Calendar years	Fine-ounces	Value
1910	4,657,017	96,269,100
1911	4,687,053	96,890,000
1912	4,520,719	93,451,500
1913	4,299,784	88,884,400
1914	4,572,978	94,531,800
1915	4,887,604	101,035,700
1916	4,479,057	92,590,300
1917	4,051,440	83,750,700
1918	3,320,784	68,646,700
1919	2,918,628	60,333,400
1920	2,476,166	51,186,900
1921	2,422,006	50,067,300
1922	2,363,075	48,849,100
1923	2,502,632	51,734,000
1924	2,446,000	52,277,000
1925	2,412,000	49,860,000
1926	2,335,000	48,270,000
1927	2,197,125	45,418,600
1928	2,194,295	45,360,100

In 1915 the United States gold production was valued at \$101,035,700 which constituted 21.5 per cent of the world's output. In 1923 domestic production was but 14 per cent of the total; in 1927 it was only 11 per cent. This reduced output proportion may be expected to continue as there are only a few primary gold-producing mines of importance now operating in the United States and their output is not increasing. Until some downward revision in the general commodity price level takes place, or governmental aid

UNITED STATES REFINERY PRODUCTION OF GOLD FOR 1928

FIGURES COMPILED BY THE BUREAU OF THE MINT, WITH THE COÖPERATION OF THE UNITED STATES

State	Ounces	Value
Alaska	309,668	\$6,401,400
Arizona	184,522	3,814,400
California	522,822	10,807,700
Colorado	253,577	5,241,900
Georgia	24	500
Idaho	20,545	424,700
Montana	57,644	1,191,600
Nevada	174,895	3,615,400
New Mexico	31,705	655,400
North Carolina	34	700
Oregon	9,656	199,600
Pennsylvania	895	18,500
South Carolina	19	400
South Dakota	320,112	6,617,800
Tennessee	624	12,900
Texas	585	12,100
Utah	205,226	4,242,400
Washington	15,557	321,600
Wyoming	34	700
Philippine Islands	86,151	1,780,900
Totals	2,194,295	\$45,360,100

of some sort is tendered to the gold producers, it appears probable that an increasing proportion of the United States gold output is to come as a by-product from the copper, lead, and zinc mines which may be expected to operate at a high rate for many years.

In 1914 the United States exported some \$222,610,156 of gold and imported \$57,387,741, a balance of \$165,000,000 in excess of exports over imports. With the exception of 1919, when \$368,185,248 of gold was exported and \$76,534,046 was imported; in 1925 when \$262,639,790 was exported and \$128,273,172 was imported; and 1928 when \$560,759,000 was exported and \$168,897,000 imported; the imports were in excess of the exports, because of the extremely heavy excess of merchandise exports over merchandise imports. The gold imported into the United States up to the close of 1921, and possibly for a short while afterward, was used to cancel indebtedness earlier incurred to Federal Reserve Banks by member banks. After that time, the net gold imports were employed to build up the cash reserves of member banks with the reserve banks and to enable them approximately to increase the deposit liabilities of the member banks several times over without increasing their reliance on advances from the central banks. (On June 30, 1928, the gold reserve in the United States was valued at \$2,780,173,216.

UNITED STATES GOLD MOVEMENTS

	Imports	Exports
1913	\$63,704,832	\$91,798,610
1914	57,387,741	222,616,156
1915	451,954,590	31,425,918
1916	685,990,234	155,792,927
1917	552,454,374	371,883,884
1918	62,042,748	41,069,818
1919	76,534,046	368,185,248
1920	417,068,273	322,091,208
1921	691,267,448	23,891,377
1922	275,169,785	36,874,894
1923	322,716,812	28,643,417
1924	319,720,918	61,648,313
1925	128,273,172	262,639,790
1926	213,504,000	115,708,000
1927	207,525,000	201,455,000
1928	168,897,000	560,759,000

Since 1918 the gold production of Canada has steadily increased. Canada's 1928 gold production was valued at \$38,647,000 as compared with a \$14,463,689 output in 1918. The increasing importance of Canada's annual gold production

and the gradually declining importance of the industry in the United States indicate that in time Canada will supersede its southern neighbor as the second most important gold producer in the world.

The trend of gold production in Mexico has been downward since 1924. Several of the older gold mines of primary importance have been closed down in recent years because of the exhaustion of ore reserves and the generally unsatisfactory political and economic conditions under which the companies find it necessary to operate.

South African production continues to increase and the production record of the Transvaal was broken for the fifth consecutive year in 1928. Mining costs in 1928, however, were slightly higher and it is not improbable that this upward tendency of operating costs will continue, particularly when consideration is given to the increasingly adverse operating conditions encountered in the deep mines of the Transvaal. The outlook for the world gold industry of the future is none too promising and it appears inevitable that unless the relative value of gold is to increase, the world output must surely decline in future years.

According to an official estimate, the gold holdings of the 40 principal countries of the world at the close of 1928 amounted to \$9,981,000,000, of which the U. S. Treasury and Federal Reserve Banks held 37.6 per cent. The percentage was reduced from 41.8 at the end of 1927.

"The decrease is chiefly the result of the loss of \$231,000,000 from central gold holdings of the United States, but it is also attributable to the fact that the reported gold holdings of all central banks and governments were \$446,000,000 larger at the end of 1928 than at the end of 1927," the Federal Reserve Board said.

The increase was greater than the total amount of new gold mined during the year, about \$405,000,000, notwithstanding the fact that over \$80,000,000 of gold was absorbed by India and an unknown amount taken for industrial consumption, according to the board.

The unusual growth of monetary gold was accounted for largely by the return of gold by the French public to the Bank of France and the shipment of gold to England and Germany by Russia, in excess of the production of the Russian mines and the loss of gold by the State Bank.

Attention was called to the fact that the Bank of the Nation in Argentina, although not an institution of issue, holds a substantial part of the monetary gold reserves of that country.

Figures given by the board represent physical gold held either at home or abroad by central banks and public treasuries. They do not include items that are understood to represent or include holdings of foreign assets other than earmarked gold; nor do they include gold technically known as "in circulation," that is, gold held by commercial banks, business concerns, and private individuals. The board explained that figures for gold in circulation are difficult to obtain.

At the end of 1928, the gold held by national banks in the United States amounted to \$17,000,000; by the commercial banks of Australia, \$126,000,000; by the Argentine banks, other than the Bank of the Nation, \$11,000,000; and by Canadian banks, \$77,000,000.

Holdings at the end of the year as compared with 1927 were given as follows: United States, \$3,977,000,000; Canada, \$152,000,000, decrease of

\$38,000,000; Spain, \$502,000,000, decrease of \$8,000,000; Russia, \$97,000,000, decrease of \$5,000,000; France, \$954,000,000, increase of \$299,000,000; Germany, \$444,000,000, increase of \$206,000,000; Argentina, \$529,000,000 increase of \$78,000,000; Brazil, \$101,000,000, increase of \$48,000,000; Italy, \$239,000,000, increase of \$27,000,000; Belgium, \$100,000,000, increase of \$26,000,000; Netherlands, \$161,000,000, increase of \$14,000,000; Austria, \$12,000,000, increase of \$12,000,000; Poland, \$58,000,000, increase of \$12,000,000; Uruguay, \$59,000,000, increase of \$9,000,000; England, \$742,000,000 increase of \$8,000,000; and India, \$119,000,000, increase of \$5,000,000.

**GOLDBERGER, JOSEPH (1874- )**. An American physician, born in Austria-Hungary. He obtained his education in arts at the City College of New York and his degree in medicine from Bellevue Hospital Medical College, New York, in 1895. After a short term of private practice at Wilkes-Barre, Pa., he entered the U. S. Public Health Service, becoming past assistant surgeon in 1904 and surgeon in 1912. The earlier part of his government service was devoted to preventive medicine and later he was made director of field nutrition investigation. Although he has studied many of the transmissible diseases, he is best known for his persistent investigation of pellagra over many years and for his experiments, carried out at times on his own person, with pellagra-producing diets.

**GOLD COAST**. A British colony of West Africa which includes within its administrative area Ashanti and the protectorate of the Northern Territories. Total area, 80,000 square miles; population, census of 1911, 1,503,386; increased by 1921 to 2,078,043. In 1915 there were 2206 Europeans, and in 1921, 2165. Chief towns are Accra (38,000), Secondee (10,000), and Cape Coast Castle (15,000). Education, encouraged by the Government and by foreign missions, made great strides. There were 22 government schools and 234 government-aided schools with an average attendance of 29,640 in 1927. The staple products and exports are cocoa, palm oil, kola nuts, palm kernels, india rubber, and manganese. Exports in 1913, and 1927 were valued at £5,427,106, and £14,350,355. Imports for the same years were £4,952,494 and £13,770,542. Shipping entered and cleared, 4,814,436 tons. Chief imports in 1927 were cotton goods, machinery, provisions, apparel, hardware, and building materials. The growing importance of the United States in the Gold Coast foreign trade may be gauged from the following: imports for 1927 from the United Kingdom, £7,940,917; from the United States, £1,632,867; exports to the United Kingdom, £4,334,135; to the United States, £3,484,756. Cocoa, the chief source of the economic well-being of the native population, continues to gain steadily. Exports in 1913 were 50,554 tons; in 1928, 230,840 tons. Gold, the leading product of the Ashanti, declined. In 1912 the production was 352,957 ounces; in 1927, only 9545. Government accounts for 1913 and 1928 showed in revenues and expenditures £1,301,566 and £4,365,321, and £2,858,347 and £4,328,159. Railroad building continues; a line was completed from Accra to Anyinam (85 miles), and an extension was completed from this line to Coomassie. In 1928, 394 miles of railway were open to traffic, and 98 under construction. During the World War, the Gold Coast regiment aided in the reduction of

German Togoland, where administration was conducted by British Gold Coast officials until the surrender of the territory to the French in 1919 under a League of Nations mandate.

**GOLDEN, JOHN** (1874- ). An American playwright and producer, born in New York City. He played in stock and repertoire and was successively comic journalist, student of music, and song writer. He has composed more than 1000 songs, written many short plays, and designed scenery and costumes and composed the music for about a dozen musical comedies. His best known serious song is *Poor Butterfly*. The best plays with which he has been identified include *Turn to the Right, Lightnin', Three Wise Fools, Thunder, Dear Me, The First Year, The Wheel, Spite Corner, and Thank U*. Of a number of big shows at the Hippodrome, his best were *Hip-Hip Hoaruy, Cheer Up, and Everything* (1918-19).

**GOLDFORB, ABRAHAM JULES** (1881- ). An American zoölogist, born in London, England, and educated at the College of the City of New York and Columbia University. He was tutor in biology (1910-11), instructor in natural history (1911-13), assistant professor (1913-20), associate professor (1920-26), and professor (1926- ); at the College of the City of New York. He published articles on experimental zoölogy and embryology.

**GOLDMAN, EMMA** (1869- ). An American anarchist (see Vol. X). She was arrested and deported to Russia in 1919. In 1920 she was reported to have said that she wanted to come back to the United States, but she was not allowed to return. On promising to abstain from propaganda, she was allowed to live in Germany, but in 1924 she held a protest meeting in Berlin in behalf of the non-Communist revolutionaries in Russia, which was broken up by the police. She wrote *My Disillusionment in Russia* (1923-24).

**GOLDSMITH, ROBERT** (1882-1924). An American writer and lecturer, born at Kingston, N. Y., and educated at Phillips Academy in Andover, Mass. In 1907-08, he engaged in publishing, and at intervals from 1909 to 1916 he was active in the Congregational ministry. From 1916 on, he held editorial or administrative positions with the Russell Sage Foundation, the League to Enforce Peace, the Rockefeller Foundation, the Interchurch World Movement, the New York World, the Bureau of Political Research, and the Democratic national committee. He was the author of *A League to Enforce Peace* (1917).

**GOLDWYN, SAMUEL** (1882- ). An American motion-picture producer born in Warsaw, Poland. He organized the Jesse Lasky Feature Photoplay Company, the Goldwyn Pictures Corporation, the Eminent Authors' Pictures, Inc., and the Madison Productions, Inc., and was a pioneer in inducing American authors to work actively for the motion pictures. Among the stars he introduced to the screen were Mary Garden, Pauline Frederick, and Geraldine Farrar. He has published a volume of reminiscences.

**GOLF.** Golf undoubtedly has the largest following of any of the sports. The nature of the pastime makes it impossible for any great number of spectators to witness important matches, but their progress is closely watched by countless thousands through the medium of the press. The leading newspapers in every large country

devote more space to golf happenings than to any other branch of sport. Not only are international, national, and sectional tournaments thoroughly described, but even the outcomes of myriad local club competitions are carefully summarized. The principal New York City dailies, for example, contain as much as three columns of golf news Sundays and Mondays giving the results of the week-end contests throughout the Metropolitan District.

The United States, Great Britain, and France lead the way in golfing enthusiasm and it is natural therefore that the outstanding performers on the links should be found in those countries. The question of age does not enter so largely in this sport as it does in other forms of athletic recreation and competition, when it comes to proficiency, and the same little coterie of star players may hold sway for a decade or more. Among the veteran players who have succeeded long and gloriously and still figure prominently in any championship test they enter are Walter C. Hagen, James Barnes, Francis Ouimet, Jock Hutchison and Gene Sarazen of the United States and Abe Mitchell, George Duncan and Cyril Tolley of Great Britain. Other preëminent competitors are Robert T. Jones, Jesse Sweetser, Thomas Armour, William MacFarlane, George Von Elm, Leo Diegel, Johnny Farrell, and Horton Smith of the United States along with T. P. Perkins, Dr. W. Tweddell, Roger Wethered, and E. W. Holderness of Great Britain.

The widespread popularity of golf is due in considerable measure to the appeal it has for womankind. So keen has been feminine interest in this sport that several women have established course records but little higher than those set by men. Miss Joyce Wethered and Miss Cecil Leitch of England and Miss Glenna Collett of the United States are two whose golf play has been especially brilliant. Mmes. S. LaChaume and L. Le Blan of France also deserve mention.

Walter C. Hagen is perhaps the most remarkable golf player in the history of the game. Back in 1914, Hagen captured his first important championship by winning the U. S. National Open tournament. Defying the passing years, this same player gained the British Open title in 1922, again in 1924, and more amazing still, both in 1928 and 1929.

Among the younger players, Robert T. Jones is conspicuous. Jones won the U. S. National Open tournament in 1923, the U. S. Amateur in 1924-25-27-28, and the British Open Tournament in 1926 and 1927.

The triumphant sweep of golf has not ignored the college world. In the United States, various groups of institutions in the several sections of the country hold annual tournaments, while dual golf meets between colleges are rapidly increasing in number each year. The preparatory and public schools also have their tourneys.

**GOLLANCZ, gôl'anks, SIR ISRAEL** (1863- ). An English scholar (see Vol. X), professor of English Language and Literature in the University of London, and Leofric lecturer in Old English at University College, Exeter. He was knighted in 1919. Besides critical editions of numerous alliterative poems, he wrote the *Book of Homage to Shakespeare* (1916), *The Sources of Hamlet* (1926), and *The Caedmon Manuscript of Anglo-Saxon Biblical Poetry* (1927).



**GOMEZ**, gō'mās, JUAN VICENTE (1859- ). A Venezuelan President (see VOL. X). In 1913 ex President Castro attempted to regain power, and on August 3, President Gomez took command of the army to restore public order. On Jan. 1, 1914, he returned to Caracas and resumed the presidency. His term ended on Apr. 19, 1914, and on that day the Venezuelan Congress elected him commander-in-chief of the national army. On May 3, 1915, he was reelected president, but remained commander of the army until 1918, while former President Bustillos acted as provisional President. On May 3, 1922, on the expiration of his term, he was reelected for the term 1922-29. Reelected again in 1929, he declined the Presidency and assumed the post of commander-in-chief of the army instead. A number of revolutionary outbreaks were subdued during his last term as President.

**GOMPERS**, SAMUEL (1850-1924). An American labor leader (see VOL. X). On the entrance of the United States into the World War, he was appointed a member of the Advisory Commission of the Council of National Defense (1917-19); and in 1918-19, he was a representative of the American Federation of Labor at the Paris Peace Conference. He was president of the international commission on labor legislation at the Peace Congress; chairman of the delegates from the American Federation of Labor to the convention of the International Federation of Trades Unions at Amsterdam (1919); a member of the President's first industrial conference (1919), of the President's unemployment conference (1921), and of the President's advisory disarmament commission (1921-24). In addition, he held the presidency of the Pan-American Federation of Labor. In 1921 he was elected president of the American Federation of Labor for the fortieth time.

**GONADS**. See SECRECTIONS, INTERNAL.

**GONZALEZ VIQUEZ**, CLETO. See VIQUEZ, CLETO GONZALEZ.

**GONZIA AND GRADISCA**. See FIUME-ADRIATIC CONTROVERSY.

**GOOCH**, GEORGE PEABODY (1873- ). An eminent British historian, a Fellow of the British Academy, who was educated at King's College, London; Trinity College, Cambridge, and in Berlin and Paris. A Liberal, he represented Bath in Parliament from 1906 to 1910. He was joint editor of the *Contemporary Review*, of the *British Documents on the Origins of the War*, (Vol. IV, The Anglo-Russian Rapprochement, 1903-07) and of the *Cambridge History of British Foreign Policy, 1783-1919* (3 vols., 1922-23), and he edited *The Later Correspondence of Lord John Russell, 1840-1878*. (1925). His writings include *English Democratic Ideas in the Seventeenth Century* (1898); *Annals of Politics and Culture* (1901); *History of Our Time* (1911); *History and Historians of the Nineteenth Century* (1913); *Political Ideas from Bacon to Halifax* (1914-15); *Germany and the French Revolution* (1920); *Life of Lord Courtney* (1920); *Nationalism* (1920); *History of Modern Europe, 1878-1919* (1923); *Franco-German Relations, 1871-1914* (1923); *Germany* (1925), and *Recent Revelations of European Diplomacy* (1927 and 1928).

**GOOD**, JAMES WILLIAM (1866- ). An American cabinet official. He was born at Cedar Rapids, Iowa, and was graduated at Coe College in 1892. After obtaining the degree of LL.B. at the University of Michigan, he practiced at Cedar

Rapids, where he served three years as City Attorney. He was elected to Congress as a Republican by the Fifth Iowa District for seven successive terms (1909-23), becoming chairman of the House Committee on Appropriations and the select committee on the budget in the 66th and 67th Congresses. He resigned his seat in 1921 and engaged in the practice of law in Chicago. On Mar. 4, 1929, he entered President Hoover's Cabinet as Secretary of War.

**GOODALE**, HUBERT DANA (1879- ). An American zoologist, born at Troy, N. Y., and educated at Trinity College, in Connecticut, and Columbia University. He was resident investigator at the Station for Experimental Evolution, Cold Spring Harbor, N. Y. (1911-13) and research biologist in poultry husbandry at the Massachusetts Experiment Station (1913-22). Since 1922 he has been engaged in research work at Mt. Hope Farm, Williamstown, Mass. Professor Goodale's publications have been on heredity, mainly in connection with domestic fowl.

**GOODING**, FRANK R. (1859-1928). A United States Senator, who was born in England and taken by his parents to the United States in 1867. At the age of fifteen, he went to California and six years later to Idaho (then a Territory). He was a contractor for mining companies and later operated large farms and sheep ranches. He was a member of the Idaho State Senate, chairman of the Republican State Central Committee, and Governor of Idaho (1905-07). In 1921 he was appointed a U. S. Senator to fill an unexpired term and was elected for two terms (1921-33). In the Senate, he served on the Interstate Commerce Committee. He died in the second year of his second term.

**GOODMAN**, JULES ECKERT (1876- ). An American dramatist, born in Gervais, Oreg., and educated at Harvard and Columbia Universities. He was prominent in magazine work for years as managing editor of *Current Literature* and with the *Dramatic Mirror* and *Outing*. His writings include, in collaboration with Montague Glass, *The Man Who Came Back* (1916); *Object: Matrimony* (1916); *Business before Pleasure* (1917); *Why Worry?* (1918); *His Honor Abe Potash* (1919). He also wrote *The Silent Voice* (1914) and *Pietro* (1919), in both of which Otis Skinner was starred; *The Dreamer* (1920); *The Law Breaker* (1921); *Chains* (1923), renamed *Morals* when performed in England, (1924); *Simon Called Peter* (1924); *Treasure Island* (1928).

**GOODNOW**, FRANK JOHNSON (1859- ). An American legal scholar and university president (see VOL. X). He was president of Johns Hopkins University, 1914-29, resigning in the latter year. He published *Principles of Constitutional Government* (1916), and *China, an Analysis* (1926).

**GOOSSENS**, EUGENE (1893- ). A British composer and conductor, born in London. He began his musical studies at the Conservatory in Bruges in 1903 and entered the Liverpool College of Music in 1906. In 1907 he won a scholarship at the Royal College of Music in London, where he spent the next four years under Rivarde (violin) and Stanford (composition). From 1911 to 1915, he was a violinist in the Queen's Hall Orchestra and appeared occasionally as conductor of his own works. In 1915 Beecham engaged him for his opera company, to conduct Stanford's *The Orlino*; of this task the young man acquitted

himself so successfully that he remained as regular conductor until the dissolution of the enterprise in 1920, when he was engaged by the British National Opera Company. In the meantime, frequent appearances as guest-conductor with several orchestras in the provinces and in London had established his reputation as one of the foremost of British conductors. In 1923 he appeared in the United States as guest-conductor of the Rochester Philharmonic Orchestra for the first half of the season. Since then, he has spent a considerable portion of every musical season in the United States, appearing as guest-conductor of several of the leading symphony orchestras. During the summer of 1926, he was conductor of Diaghilev's Russian Ballet in London and, in the fall of that year, he began his duties as conductor of the Rochester Opera Company. As a composer, he is very prolific and won recognition from the beginning. He is an uncompromising exponent of ultramodern tendencies. Among his works are two symphonic poems, *Perseus* and *The Eternal Rhythm*; *Symphonic Prelude* to a poem by Ossian; an orchestral scherzo, *Tam O'Shanter*; *Variations on a Chinese Theme* for orchestra; *Poem* for violin and orchestra; *Miniature Fantasy* for string orchestra; *Fantasy Set for strings*, commissioned for the Berkshire Festival, 1923; a great deal of chamber music; piano pieces and songs; an overture and incidental music to Verhaeren's *Philip II* and to Somerset Maugham's play *East of Suez*; and a one-act opera, *Judith* (London, 1929).

**GORDON, CHARLES WILLIAM** (1860- ). A Canadian author (see VOL. X). In 1915 he was chaplain with the Canadian forces in France. He served on a special commission for the Imperial government and the Canadian government in the United States (1917) and on a special commission for the Canadian government to Great Britain (1918) and was appointed chairman of the Council of Industry for the Province of Manitoba by the provincial government (1920). He was Moderator of the General Assembly of the Presbyterian Church of Canada in 1921. Among his later publications are *The Major* (1917), *The Sky Pilot in No Man's Land* (1919), *To Him That Hath* (1921), *The Gaspards of Pine Croft* (1923), *Treading the Wine Press* (1925), and *The Friendly Four* (1927). He wrote under the name of "Ralph Connor."

**GORDON, WALTER HENRY** (1863-1924). An American army officer, born in Wilkinson County, Mass. He graduated from the United States Military Academy in 1886, served in the Spanish-American War and the Philippines and was appointed colonel of the 31st Infantry in 1916, and brigadier general in the National Army in 1917. He served as commander of the 154th Depot Brigade at Camp Meade, Md., in 1917, and in the same year was transferred to the 10th Infantry Brigade, 5th Division, Camp Forrest, Ga. In 1918 he was appointed major general commanding the 6th Division. In 1918-19 he was in service in France and was with the Army of Occupation in Germany in 1919. In 1920 he was appointed commandant of the Infantry School at Camp Benning, Ga. He was honorably discharged as major general in 1919, and was appointed brigadier general of the Regular Army in 1921. He was promoted to major general in 1923 and retired in January, 1924. In the following April he died.

**GORE, THE RT. REV. CHARLES** (1853- ). An English theologian and prelate (see VOL. X). In 1919 he resigned the bishopric of Oxford, which he had held since 1911. He settled in London and identified himself with the Christian Socialists. Among his later works were *The Religion of the Church* (1916); *The Epistle of St. John* (1920); *Christian Moral Principles* (1921), *Belief in God* (1921), *The Duty of Christ* (1922), *Belief in Christ* (1922), *The Holy Spirit and the Church* (1924), *Can We Then Believe?* (1926), and *Christ and Society* (1928). He edited *A New Commentary on Holy Scriptures, including the Apocrypha* (1928).

**GOREMYKIN, gör'e-mik'in, IVAN LONGINOVITCH** (1839-1917). A Russian statesman (see VOL. X) again premier from 1914 to February, 1916. His opposition to the liberal aims of the Duma led to his resignation. After the Revolution, he was arrested and confined for a short time in the Fortress of St. Peter and St. Paul. With his wife and brother-in-law, he was murdered in the Caucasus in December, 1917.

**GORGAS, WILLIAM CRAWFORD** (1854-1920). An American sanitarian, and U. S. Army Surgeon General (see VOL. X). He was raised to the rank of major general in 1915. He died in London, Eng., on July 4, 1920, and his funeral was held in St. Paul's Cathedral. A laboratory for the Gorgas Memorial Institute of Tropical Research and Preventive Medicine, for which funds were provided by the United States and several Latin-American governments, was dedicated at Panama on Apr. 2, 1929.

**GORKY, gör'kë, MAXIM** (1868- ). The pseudonym of ALEXEI MAXIMOVITCH PESHKOV, a Russian author (see VOL. X). At the outbreak of the World War, he returned to Russia. At first he was opposed to the Bolsheviks, but later became reconciled to their régime; in 1920, however, he went to Sorrento, Italy, to live. His later works include three autobiographical volumes *My Childhood* (1915), *In the World* (1917), and *My University Days* (1923); *About the Devil*; *Comrades*; *Reminiscences of L. N. Tolstoy* (1920); *The Note-Book of Anton Chekhov* (1921); *Reminiscences of Anton Chekhov*, with Bunin and Kuprin (1921); *Through Russia*, stories (1922); *Écrits de Révolution* (1922); *The Judge*, a play (1924); *Fragments from my Diary* (1924); *Lénine*; *et Le Paysan russe* (1925); *The Story of a Novel and Other Stories* (1925); *Sur les Chemins de ma vie* (1926); *Decadence*, a novel (1927); *Les Artamomov*, a novel (1928), *Reminiscences of Leonid Andreyev* (1928); *The Bystander* (1927), the first volume of a novel, *The End and the Beginning*.

**GORMAN, JAMES EDWARD** (1863- ). An American railway official, born in Chicago. He began his railroad career with the Chicago, Burlington & Quincy road, in 1877. He occupied important positions in several companies and was with the Atchison, Topeka & Santa Fe in various capacities from 1895 to 1917. In the latter year, he became president of the C. R. I. and P. R. R. and was Federal manager of this road from 1918 to 1920, when he again became its president.

**GOSSE, gös, SIR EDMUND (WILLIAM)** (1849-1928). An English poet, critic, and biographer (see VOL. X). He was chairman of the board of Scandinavian studies at University College in London (1917-1928) and president of the

English Association (1921). Many honors were bestowed on him, and in 1925 he was knighted. His later works include *Collected Poems* (1911), *Inter Arma* (1916), *The Life of Algernon Charles Swinburne* (1917), *Three French Moralists* (1918), *Diversions of a Man of Letters* (1919), *Malherbe* (1920), *Books on the Table* (1921), *Aspects and Impressions* (1922), *More Books on the Table* (1923), *Silhouettes* (1925), *Leaves and Fruit* (1927), and *Thomas Lovell Beddoes*, edited with a new memoir by Gosse (1928).

**GOTCH, JOHN ALFRED** (1852- ) An English architect and author. He attended the University of Zurich, and, articulated to R. W. Johnson of Melton Mowbray, he began the practice of architecture in 1878. He was a member of the Royal Fine Arts Commission and was president of the Royal Institute of British Architects in 1923-25. He was also a corresponding member of the American Institute of Architects. His books include *Architecture of the Renaissance in England* (1894); *Early Renaissance Architecture in England* (1901); *The Growth of the English House* (1909); *The Original Drawings for the Palace at Whitehall, attributed to Inigo Jones* (1912); *The English Home from Charles I to George IV* (1918); and *Old English Houses* (1925).

**GÖTEBORG, gütēbör', GOTHENBURG, or GOTTENBURG.** The principal port, manufacturing centre, and second city of Sweden. The population in 1928 was estimated to be 233,303. Göteborg is the home port for several passenger steamers, maintaining services to the United States, Australia, and England; it is a terminal for some of the most important railway-lines in Sweden, such as the newly electrified line from Stockholm to Göteborg; and it is an important junction on the international air-lines of Europe, its aerodrome being situated at Torslanda. The Harbor of Göteborg, part of which is a free port, is 15 kilometers (9.32 miles) long and is divided into two portions, the upper portion accommodating inland shipping and the lower one being used by coastal and seagoing vessels. The harbor facilities have been greatly improved; several shipyards and repair docks are located in the harbor district, including a new floating drydock of 20,000 tons lifting capacity. At the beginning of 1928, 281 vessels of 522,312 gross tonnage were entered and cleared. The new post office is one of the finest in Europe, and the Lorensberg Theatre is the leading playhouse of Scandinavia.

Among the principal attractions of Göteborg are its highly specialized museum collections, ranging from South American Indian antiquities and Oriental specimens, collected in the days when trade flourished with the East Indies, to native handicrafts and modernistic art. The sociological-historical and ethnographical collections are housed in buildings that were once the offices and warehouses of the East-India Company, while a new building has been erected in Slottsskogen, the most famous of Göteborg's many beautiful parks, for the natural history collections. The Röhs Art and Handicraft Museum has a complete collection of book-bindings and printings, Chinese art, textiles, and other hand-wrought wares. The collection of pictures in the Art Gallery affords a complete representation of modern Swedish painting, and the exhibits are regarded as among the best arranged and most valuable in Europe. Göteborg is distinguished for its many large and well-

organized charities and benevolent institutions, donations for humanitarian and cultural purposes having been made by its citizens on a larger scale than in any other city of Sweden. It was also the first city in Scandinavia to establish modern workmen's dwellings. From May 8 to September 30, 1923, a jubilee exposition was held to celebrate Göteborg's 300th birthday and to show the progress which Swedes have made in manufacture and commerce, education and music, arts and sciences, at home and in foreign lands.

**GOTHENBURG, güt'en-burk.** See GÖTEBORG.

**GÖTZINGER, güt'sing-ër, GUSTAV** (1880- ). An Austrian geologist at the Geological Institute, Vienna, born in Neu-Serowitz, Moravia, and educated at the Gymnasium and the University of Vienna. He was editor of the *Geographische Jahresbericht aus Österreich*. In 1906-11 he was oceanographer of the Society for the Investigation of the Adriatic and in 1912 he was appointed section geologist of the Geological Institute at Vienna. He is the author of numerous works, dealing especially with glacial and marine geology, including *Oceanographische Beobachtungen Nordlicher Adria* (1910); *Geomorphologie der Lunzer Seen, Geologie und Morphologie Dinara, Morphologie des Ostlichen Kalkhochplateaus* (1912); *Gletschervermessung der Alpen* (1906); *Nordisches Diluvium West-Schlesiens* (1914, 1915); *Erzgebirge, Österreichische Alpenseeforschung* (1916); *Eis der Lunzer Seen* (1917); *Phosphathöhle von Csaklovina* (1919); *Denkmalpflanzen und Naturdenkmäler* (1921); *Alpenrandgeologie* (1923), and *Rutschender Grasberg* (1923).

**GOUCHER COLLEGE.** A nonsectarian college for women at Baltimore, Md., founded in 1885. The student enrollment increased from 386 in 1913-14 to 1053 in 1927-28. The faculty was enlarged from 29 to 103 members (in 1928), and the library from 12,000 to 40,500 volumes during the same period. The endowment fund, begun during the period under review amounted to \$1,500,000 in 1924 and to \$2,386,980 in 1928. A site was purchased in 1921 at Towson, Md., and a campaign inaugurated to collect \$6,000,000, of which \$5,000,000 was to be used to move the college from Baltimore to Towson. The remaining \$1,000,000 was to be added to the permanent endowment fund, to which the General Board in New York pledged \$400,000 in 1921 and paid an additional \$40,000 in cash. The Board also gave \$250,000 to the endowment fund of the college in 1917. President, William Westley Guth, Ph.D., LL.D.

**GOULD, EDWIN** (1866- ). An American railway official (see VOL. X). In 1917-18 he served with Squadron A, New York National Guard, and in the latter year was major of ordnance in the 1st Brigade.

**GOURAUD, gūr'ū, HENRI JOSEPH ÉTIENNE** (1867- ). A French general who was born in Paris, trained at St. Cyr, and served in Africa from 1894 to 1914. In 1912 he became general of brigade, and in 1914 a general of division. During the World War, he served first in the Argonne, where he commanded the 10th Division (1914), then in command of the 1st Corps of the Colonial Army (1915), and from May to June, 1915, he led the expeditionary corps in the Dardanelles, until he was wounded and lost his right arm. He commanded the 4th Army from December, 1915, until September, 1919, with

an interim of six months in 1916-17 when he was resident general of Morocco. In September, 1919, he was Governor of Strassburg, and in November of that year became commander-in-chief of the Army of the Levant and high-commissioner for France in Syria and Cilicia (retired in 1923). In 1922 he was appointed a member of the Higher War Council, and in the following year he became Military Governor of Paris. He visited the United States in 1929 to attend the reunion of the Rainbow Division, A. E. F., at Baltimore, as representative of the French government.

**GOYAU, gōy'ō, PIERRE LOUIS THIÉOPHILE GEORGES** (1869- ). A French religious historian who was born at Orléans and was educated at the École Normale Supérieure and taught at the École Française in Rome. As one of the editors of the powerful *Revue des Deux Mondes* and *Figaro* he wielded an influence in behalf of conservatism and Catholicism. His writings reflected the social Catholic tradition of Joseph de Maistre. He was elected a member of the French Academy in 1922. A partial list of his writings includes *Le Pape, les Catholiques, et la question Sociale* (1893); *Le Vatican* (1895); *Autour du catholicisme social* (15 series: 1897, 1901, 1907, 1910, and 1913); *L'Allemagne Religieuse: Le Protestantisme*, Prix Bordin of the French Academy (1898); *L'Idee de Patrie et l'humanitarisme* (1901); *L'Allemagne religieuse: le Catholicisme* (4 vols., 1905, 1908); *Bismarck et l'Eglise* (4 vols., 1910-13); *Le Cardinal Mercier* (1917); *La pensée religieuse de Joseph de Maistre* (1921); *St. Jeanne d'Arc* (1921); *Histoire religieuse de la nation française* (1922); *Une Épopée mystique* (1924); *Le Cardinal Lavigne* (1925); *Frédéric Ozanam* (1926); *Le Visage de Rome chrétienne* (1927); and *Saint Louis* (1928).

**GRABAR, IGOR E.** (1871- ). A Russian landscape painter, one of the leaders of the Moscow group who, in reaction against the realism of the Wanderers, depict Russian scenes in an impressionistic style, Grabar himself being a pointillist. He is also a writer on art. See **PAINTING**, under *Russia*.

**GRABAU, MARY ANTIN.** See **ANTIN, MARY.**

**GRAFF, KASIMIR ROMUALD** (1878- ). A German astronomer, born at Prochnowo, Posen, and educated at the Gymnasium and at Friedrich-Wilhelm University in Berlin. In 1900 he became a member of the board of directors of the Urania Observatory in Berlin. In 1909 he transferred to the Hamburg observatory, where he became a professor in 1917. He wrote *Grundriss der Geographischen Ortsbestimmung* (1914); a German adaptation of Fabre, *Der Sternhimmel* (3d ed., 1921); an adaptation of Newcomb, *Astronomie für Jedermann* (4th ed., 1922); *Astrophysik*, with Scheiner (1922), and *Gründer der Astrophysik* (1927).

**GRAFLY, CHARLES** (1862-1929). An American sculptor (see **VOL. X**). In 1915 he served on the International Jury of Awards at the Panama-Pacific International Exposition. In 1917 he became instructor in the Boston Museum of Fine Arts. Among his awards during the period were the Watrous Gold Medal of the National Academy of Design, 1918, the Potter Palmer Gold Medal, 1921, and the medal of honor of the Concord Art Association, 1922.

**GRAHAM, EVARTS AMBROSE** (1883- ). An American surgeon and discoverer of the radio-diagnostic resource of cholecystography, who was

born in Chicago. He received the degrees of A.B. from Princeton in 1904 and of M.D. from Rush Medical College in 1907. From 1908 until the outbreak of the World War, he taught and did original research work in surgery at Rush College. During the War, he served with the rank of captain and major, was active in the School of Neurological Surgery in Chicago, and as member of the Empyema Commission at Baltimore made original researches on empyema which were recorded in a monograph. He was mustered out of the army in 1919 and became professor of surgery in the Washington University School of Medicine, St. Louis, and surgeon in chief to the Barnes Hospital. In 1925 with several associates, he published his first reports of the method discovered by him of visualization of the gall-bladder which was at once popularized throughout the world and has revolutionized knowledge of this organ and its diseases and greatly enlarged the sphere of diagnosis. He was awarded numerous honors including the gold medal and certificate of merit from the St. Louis Medical Society, 1927, for his work in cholecystography.

**GRAHAM, STEPHEN** (1884- ). An English writer (see **VOL. X**). During the World War, he served as a private in the Scots Guards (1917-18) and afterward he continued his life of wandering. His later works include *With Poor Emigrants to America* (1914); *Russia and the World* (1915); *The Way of Martha and the Way of Mary* (1915); *Through Russian Central Asia* (1916); *Russia in 1916* (1917); *Priest of the Ideal* (1917); *Quest of the Face* (1918); *Private in the Guards* (1919); *Children of the Slaves* (1920); *The Challenge of the Dead* (1921); *Europe—Whither Bound?* (1921); *Tramping with a Poet in the Rockies* (1922); *Under-London* (1923); *In Quest of Eldorado* (1924); *Life and Last Words of Wilfred Ewart* (1924); *Russia in Division* (1925); *London Nights* (1925); *Midsummer Music* (1926); *the Gentle Art of Tramping* (1927); *New York Nights* (1928); *The Lay Confessor* (1928); and *Peter the Great* (1929).

**GRAHAM, THE RT. HON. WILLIAM** (1887- ). A British public official and labor leader, who was educated in private schools and at Edinburgh University. He was a member of numerous national and local public bodies including the Edinburgh Town Council and was elected to Parliament in 1918. He was Financial Secretary to the Treasury in the Labor Government of 1924. He was named president of the Board of Trade in the Labor Cabinet formed June 7, 1929. He wrote *The Wages of Labor* (1921) and has contributed articles on social, industrial, and political questions to newspapers and periodicals.

**GRAHAME-WHITE, CLAUDE** (1879- ). An English aviator, writer, and aeronautical engineer (see **VOL. X**). He was a flight commander in 1914, but resigned to supervise the filling of British government aeroplane contracts. His London aerodrome and factory at Ilford were acquired by the Government in 1925. Among his later books are *Learning to Fly* (1914); *Aircraft in the Great War* (1915); *Air Power—Naval, Military, and Commercial* (1917); *Our First Airways, Their Organization, Equipment, and Finance* (1918); and *Heroes of the Flying Corps* (1919).

**GRAIN.** See **AGRICULTURE; W- EAT.**

**GRAINGER, PERCY (ALDRIDGE)** (1882- ). A British composer and pianist, born at

Brighton, Melbourne, Australia. He received his first instruction on the piano from his mother, continued with J. Kwast in Frankfort (1894-1900), and was for a short time with Busoni. After a most successful début in London, in 1900, he toured Great Britain, New Zealand, Australia, and South Africa. Returning to Europe in 1906, he made tours of the Continent until 1915, when he visited the United States and settled there permanently. He served in the American Army during the World War and was afterward naturalized. In August, 1928, he married in Los Angeles the Swedish sculptress, Ella Viola Strom. As a composer, he became known first in 1912, when he conducted his *Mock Morris* at one of Gardiner's concerts in London. Almost without exception, his compositions are based on folk music, of which he is not only a profound student but also an ardent collector; he has taken more than 500 records of folk melodies of all the countries he has visited. His choral works with orchestra include *Father and Daughter*, *Sir Eglamore*, *The Bride's Tragedy*, and *Marching Song of Democracy* (for the Worcester Festival, 1916). He also has written *In a Nutshell*, suite for piano and orchestra; for orchestra, *Molly on the Shore*, *English Dance*, *Colonial Song*, *Shepherd's Hey*; numerous pieces for piano, and a few songs. Consult D. C. Parker's P. A. Grainger: A Study (New York, 1918).

**GRAIN STANDARDS.** See WHEAT.

**GRAND ARMY OF THE REPUBLIC,** THE. An order formed in 1866 among a number of former soldiers who had served in the Civil War. Auxiliary orders are the Woman's Relief Corps, Ladies of the G. A. R., Sons and Daughters of Union Veterans, and their auxiliaries. A national encampment is held in September, department encampments in June. Delegates to the national body are chosen by the Department of Encampments, and those to the Department Encampments by the Posts. The 62d National Encampment was held at Denver, Colo., September, 1928, while the 63d National Encampment was held at Portland, Me., in 1929. The successive encampments have had a smaller attendance each year due to the heavy mortality and the aged veterans are transported in motor vehicles in the processions that have been features of these gatherings.

**GRAND RAPIDS.** A city of Michigan, at the head of navigation on the Grand River. The population rose from 112,571 in 1910 to 137,634 in 1920 and to 164,200 in 1928 by estimate of the Bureau of the Census. The population of greater Grand Rapids, according to local estimates, is 192,256. The area is 23.4 square miles, or 14,985 acres. Of this acreage, 250 acres constitute the area of Grand River within the city's limits. A charter providing that Grand Rapids be governed by a commission of seven members and a city manager went into effect in 1917. In 1920 active city-planning work was begun, and since 1923 Grand Rapids has had a zoning ordinance which limits the height of buildings and the portion of land area they may occupy and sets aside sections to be used for residence, business, and industry. Grand Rapids ranks second among the larger cities of the United States as to percentage of home ownership, 50.2 per cent of the houses being owned by the families occupying them. Building permits increased from \$3,618,119 in 1914 to \$10,204,795 in 1923; in 1927 their value was \$8,222,090. During the

period a municipal tuberculosis hospital costing \$605,000, a high school costing \$600,000, grade schools, a theatre costing \$750,000, hotels, churches, a Roman Catholic seminary, and an academy were built. The William H. Dean Bridge, constructed in 1927 at a cost of \$435,000, is a memorial to a private who, during the Spanish American War, volunteered himself to the medical corps for experiments in seeking to conquer yellow fever. The assessed valuation of property in Grand Rapids in 1928 was \$203,425,006; the net debt was \$13,521,294.

Grand Rapids is the furniture-manufacturing centre of the United States. It has 68 factories which employ 13,000 artists and craftsmen and which produce furniture valued at \$60,000,000 annually. The 102d semi-annual furniture market, attended by 4000 buyers and salesmen from all parts of the United States, was held in November, 1928. Grand Rapids has the largest of all carpet-sweeper, school-seat, window-sash, pulley, excelsior, show-case, and refrigerator factories in the United States. Employees in all factories number more than 30,000. Grand Rapids is also a large producer of gypsum products, the mines being to the south and west of the city. There are within the city limits 403.28 miles of streets, 389.70 miles of public sewers, and 342.14 miles of water mains. The cost of street improvements completed in 1927 was \$1,063,503; of sewers completed in 1927, \$882,330; of water mains, \$237,865; of permanent improvements, \$2,618,698, which includes 50 miles of assessment storm and sanitary sewers constructed by the sanitary engineering division which also expended \$746,537 in bond-issue projects, making a grand total of \$3,365,235. The city has invested \$981,012 in flood protection, not including buildings and equipment. Grand Rapids with an absolutely pure water supply taken from Grand River and treated in a modern filtration plant is one of the most healthful cities in the United States. It was on the 1927 honor roll of 43 cities with a typhoid death rate per 100,000 of 0.0 to 1.9 per cent. The Grand Rapids airport, one of the finest in the United States, is on county-owned property and is under lease of the Grand Rapids Flying Club.

**GRÄNER, PAUL** (1873- ). A German composer, born in Berlin. After a varied career as operatic conductor in several German cities, he went to London in 1896 as conductor at the Haymarket Theatre and taught several years at the Royal Academy of Music. From 1902 to 1909, he taught at the Neues Konservatorium in Vienna and, from 1910 to 1913, was director of the Mozarteum at Salzburg. He then lived in Munich until 1920 and devoted himself chiefly to composition. In 1920 he accepted the professorship of composition at the Leipzig Conservatory, succeeding Reger. This position he resigned in 1925 and since then he has devoted his entire time to composition. He is the originator of *Kammermusikdichtung*, employing the usual combinations of instruments heretofore used only in pure chamber music for the purpose of interpreting a literary programme, as Raabe's *Hungerpastor* by means of a piano trio, or *Sehnsucht an das Meer* by means of a piano quintet. Among his other works are a symphony in D Minor, *Sinfonietta*, *Musik am Abend* for orchestra, and the operas, *Das Narrengericht* (Vienna, 1913), *Don Juans Letztes Abenteuer* (Leipzig, 1914), *Theophano* (Munich, 1918, rewritten as *Byzans*, Leipzig, 1922),



*Schirin und Gertraude* (Dresden, 1920), and *Hanneles Himmelfahrt* (Dresden, 1927). Consult G. Gräner's volume, *Paul Gräner* (Leipzig, 1922).

**GRANT, PERCY STICKNEY** (1860-1927). An American clergyman (see VOL. X). He continued, until 1924, as rector of the Church of the Ascension, New York City. Here he maintained a forum in which advocates of all political and social doctrines were permitted to speak freely. This was widely criticized and finally, in 1923, following action taken by Bishop William T. Manning, the forum was greatly modified in its character. The rector also came in controversy with Bishop Manning on the question of divorce. After the latter had refused to authorize his contemplated marriage to a divorcee, in June, 1924, he resigned his rectorship. His later books include *Fair Play for the Worker* (1918); *Essays and Poems* (1922); and *The Religion of Main Street* (1923).

**GRANT-SMITH, ULYSSES** (1870- ). An American diplomat, who was born at Washington, Pa., and graduated from Washington and Jefferson College (1894). After graduate studies at Harvard, he was made director and military instructor at Trinity Hall School. In 1903 he entered the American diplomatic service as second secretary of the legation at Constantinople. He became third secretary of the embassy at London (1906-08), secretary of the legation at Santiago, Chile (1908-09), at Brussels, Belgium (1909-12), counselor of the embassy at Vienna (1912-17), counselor of the legation at Copenhagen, and chargé d'affaires (1917-19), U. S. Commissioner in Hungary (1919-21), negotiating the American-Hungarian Treaty of Peace; Minister to Albania (1922-25), and Minister to Uruguay since 1925.

**GRANVILLE-BARKER, HARLEY.** See BARKER, HARLEY GRANVILLE.

**GRAPHITE.** Graphite is extensively consumed in the United States for various industrial purposes. The natural product, both in its crystalline and amorphous forms, entered into consumption, together with the manufactured product, which is made in the electric furnace. In addition to the native supply, the crystalline graphite used in the United States is produced in Ceylon, Madagascar, Japan, Austria, Bavaria, and Czechoslovakia, as indicated in the accompanying table. It is used mostly in making crucibles and as the metallurgical activities of the War led to extensive mining, there was abnormal production which was gradually later being absorbed.

The crystalline product, in the form of lump, chip, or dust, comes mainly from Ceylon, while most of the imported crystalline flake comes from Madagascar and Canada. The amorphous graphite is used mainly for foundry facings and paint, and while some is mined in Rhode Island, the greater part is imported from Chosen (Korea) and Mexico.

During the period from 1913 to 1928, the use of graphite in the United States underwent radical changes. Before the War, more than one-half of the supply was consumed in the manufacture of crucibles, whereas by 1924 only 13 per cent of the graphite used in the manufacture of finished products was utilized in the manufacture of crucibles. A corresponding shift occurred in the manufacture of foundry facings for which only 10 per cent of the graphite supply was consumed in 1913, as compared with 44

per cent in 1923, and 52 per cent in 1924. The use of graphite in the manufacture of pigments and paints, pencils and crayons, commutator brushes, stove polish, and lubricants, was likewise of minor importance before the War, but of considerable importance subsequent to 1918.

In the United States, Alabama was one of the most productive states during the War, but following the War its output declined to almost insignificant proportions. In 1926 the Alabama industry experienced a revival and in 1927 three Alabama operators reported sales of 3,474,000 pounds of crystalline graphite or two-thirds of the total output for the United States. The producing States in 1928 were Alabama, Georgia, Michigan, Nevada, Rhode Island, and Texas. Imports of graphite into the United States in 1928 totaled 17,569 tons, valued at \$801,559, as compared with 16,166 tons valued at \$921,233 in 1926, an increase of 8 per cent in quantity but a decrease of 21 per cent in value.

#### DOMESTIC NATURAL GRAPHITE SOLD IN THE UNITED STATES 1914-1927

Year	Amorphous		Crystalline	
	Short tons	Value	Pounds	Value
1914	1,725	\$38,750	5,220,539	\$285,368
1915	1,181	12,358	7,074,370	417,273
1916	2,622	20,728	10,931,989	914,748
1917	8,301	73,481	10,584,080	1,094,398
1918	6,560	69,455	12,661,839	1,454,799
1919	3,379	47,716	8,086,191	731,141
1920	4,694	49,758	9,632,360	576,444
1921	1,842	20,860	1,180,523	75,664
1922	2,200	(*)	1,840,766	85,242
1923	4,056	39,560	3,964,900	151,434
1924	4,071	38,533	1,800,325	48,977
1925	3,536	39,640	2,257,250	58,721
1926	2,975	40,500	4,989,200	178,842
1927	2,595	38,850	4,224,400	197,121
1928	2,994	45,970	5,234,000	253,773

\* Bureau of Mines not at liberty to publish value.

**GRASTY, CHARLES HENRY** (1863-1924). An American journalist, born at Fincastle, Va., and educated at the University of Missouri and Washington and Lee University. He was managing editor of the *Kansas City Times* (1884-89); editor and proprietor of the *Baltimore Evening News* (1892-08); director of the Associated Press (1900-10); editor and controlling owner of the *St. Paul Dispatch* and the *Pioneer Press* (1908-09), and of the *Baltimore Sun* (1910-14); war correspondent for the Associated Press, *New York Times*, and *Kansas City Star* in Europe (1915); and treasurer of the *New York Times* (1916-20). During the World War, he was on the editorial staff of the *New York Times* (1916-21) and was widely recognized as an independent writer on war and political situations in Europe.

**GRAVES, CHARLES L.** (1856- ). An Irish author (see VOL. X). Among his later works are *War's Surprises* (1917), *Lauds and Libels* (1918), *Mr. Punch's History of the Great War* (1919); *Horace's Odes, Book V*, an English version with Rudyard Kipling (1920), *New Times and Old Rhymes* (1921), *Punch's History of Modern England* (4 vols. 1921, 1922), *More Lauds and Libels* (1925), *Hubert Parry; his Life and Works* (2 vols., 1926), *Eulogies and Elegies* (1927), and, with E. V. Lucas, *Huslied History*, etc.

**GRAVES, FRANK PIERREPONT** (1869- ). An American educator, born in New York City, and educated at Columbia University. From 1891 to 1893, he was assistant professor of Greek, and immediately afterward, professor of classical philology in Tufts College. In 1896-

98, he was president of the University of Wyoming; in 1898-1903, president of the University of Washington, and in 1904-21, professor of education or dean in Missouri, Ohio, Wisconsin, Chicago, Pennsylvania, and Columbia universities. In 1921 he became president of the University of the State of New York and Commissioner of Education. He was editor of the *Educational Review*, 1920-24. In 1927 he was awarded the Butler Medal for educational administration. His publications include *Burial Customs of the Ancient Greeks* (1891); *The Philoctetes of Sophocles* (1893); *The State University Ideal* (1897); *A History of Education before the Middle Ages* (1909); *A History of Education during the Middle Ages and the Transition to Modern Times* (1910); *Great Educators of Three Centuries* (1911); *Peter Ramus and the Educational Reformation of the Sixteenth Century* (1912); *A History of Education in Modern Times* (1913); *What Did Jesus Teach?* (1919). He also published *Addresses and Papers* (1921-26).

**GRAVES, HENRY SOLON** (1871- ). An American forester, born at Marietta, Ohio, and educated at Yale, Harvard, and the University of Munich. From 1900 to 1910, he was professor of forestry and director of the Forestry School at Yale, and from the latter date to 1920, chief of the United States Forest Service. Since 1922 he has been dean of the Yale Forestry School. He was provost of Yale University in 1923-27. He was a member of many American and foreign societies and wrote *Forest Mensuration* (1906), and *Principles of Handling Woodlands* (1911). During the World War, he was lieutenant colonel in the corps of engineers, serving in France.

**GRAVES, ROBERT RANKE** (1895- ). A British poet and critic who was born in London and educated at the Charterhouse and St. John's College, Oxford. In 1923 he and William Nicholson edited *The Owl*, and in 1926 he was professor of English Literature in the Egyptian University. His earlier poems were vivid, but the later ones became more and more intellectual and detached. His verse was collected in *Poems, 1914-1927* (1927) and in *Collected Poems* (1929). His prose writings include *On English Poetry* (1921); *The Meaning of Dreams* (1924); *Poetic Unreason and Other Studies* (1925); *My Head! My Head!* (1925); *John Kemp's Wager*, a ballad opera (1925); *The English Ballad* (1926); *Lars Porsena or "The Future of Swearing"* (1927); *Lawrence and the Arabs* (1927), and *John Skelton* (1927). With Laura Riding, he wrote *A Survey of Modern Poetry* (1927) and *A Pamphlet Against Anthologies* (1928).

**GRAVING DOCKS.** See **DOCKS**.

**GRAVITATION, IN LIGHT OF MODERN THEORY.** See **PHYSICS**.

**GRAY, ALEXANDER** (1882-1921). An American engineer, born in Edinburgh, Scotland, and educated at Edinburgh and McGill universities. Until 1904 he was engaged in engineering work in Edinburgh, and from 1910 to 1915 was assistant professor of electrical engineering at McGill University. In the latter year, he became head of the electrical engineering department at Cornell. He wrote *Electrical Machine Design* (1913) and *Principles and Practice of Electrical Engineering* (1914). He was also the author of a section of the *Standard Handbook for Electrical Engineers*.

**GRAY, GEORGE** (1840-1925). An American jurist and legislator (see **VOL. X**). He was appointed peace commissioner to Great Britain in 1915, and in the same year he was chairman of the United States delegation to the Pan-American Scientific Congress. President Wilson appointed him a member of the American-Mexican Commission in 1916.

**GRAY, LOUIS HERBERT** (1875- ). An American orientalist (see **VOL. X**). He was associate editor of the Hastings *Encyclopædia of Religion and Ethics* (Edinburgh 1905-15), editor of *Mythology of all Races* (1915-18), associate professor of philosophy at the University of Nebraska, 1921-23, and professor of comparative philology and Oriental languages at Columbia University after 1923. He was in the service of the American commission to negotiate peace in Paris (1918) and attaché to the American Embassy (1920). He edited George Louis Beer's posthumous *African Questions at the Paris Peace Conference* (1923).

**GRAYSON, CARY TRAVERS** (1878- ). An American physician, born in Culpepper County, Va., and educated at William and Mary College and the University of the South. In 1904 he graduated from the United States Naval Medical School. After service as assistant surgeon of the United States Navy, he was appointed medical director, with the rank of rear admiral, in 1910. He was the personal physician of Presidents Roosevelt, Taft, and Wilson. During the World War, he was a member of many important commissions and was also connected with the staff of several hospitals in Washington and elsewhere. He resigned from the Navy in 1928 and became president of the newly established Gorgas Institute.

**GRAZIE, grät'si-ä, MARIE EUGENE DELLE** (1864- ). An Austrian poet, dramatist, and novelist (see **VOL. X**). She published *Das Buch des Lebens und Zwei Witwen* (1914); *Die blonde Frau Tina*, *Das Buch des Lebens*, *O Jugend!* and *Eines Lebens Stern* (1916); *Homo, Donaukind, Der Liebe und des Ruhmes Kränze*, and *Die Blume der Acazia* (1921), all fiction. Her later works include *Die blonde Frau Tina und andere Geschichten* (1921); *Die weissen Schmetterlinge von Claircaux*, stories (1925); *Unsichtbare Strassen*, a novel, (1926); and the play *Die Schwelle des Lebens* (1926).

**GREAT BRITAIN.** The United Kingdom of Great Britain and Northern Ireland, and the Irish Free State. The former is a constitutional monarchy; the Irish Free State, a self-governing dominion. The capital of the United Kingdom is London, and Dublin is the capital of the Irish Free State. The term Great Britain is applicable literally to England, Scotland, and Wales; the term United Kingdom to Great Britain, Northern Ireland, the Isle of Man, and the Channel Islands; and the term British Isles to the United Kingdom and the Irish Free State. The United Kingdom with all its possessions and dependencies, including the self-governing dominions, crown colonies, protectorates, mandates, and other territories subject to the control of Parliament, constitutes the British Empire. See **BRITISH EMPIRE**.

**Area and Population.** The total area of the British Isles is 121,633 square miles, of which 88,745 square miles make up Great Britain, 27,155 square miles the Irish Free State, 5431 square miles Northern Ireland, and 302 square miles the Isle of Man and the Channel

Islands. The total population of the British Isles in 1921, exclusive of navy, army, and merchant seamen abroad, was 47,307,601, an increase of 1,937,071 over 1911. No census was taken in Ireland in 1921: so the 1911 figure was used in both years. The number of persons per square mile was, in 1911: England and Wales, 618.3; Scotland, 156.6; Northern Ireland, 230.3; Irish Free State, 115.6. In 1921 it was: England and Wales, 649.4; Scotland, 160.6. During 1928 there were 660,267 births in England and Wales with an estimated population of 39,482,000 on June 30, 1928, and 96,815 in Scotland with an estimated population of 4,893,182 on the same date; there were 460,440 deaths in England and Wales and 65,263 in Scotland. In 1921 there were 90,720 births in Ireland and 63,838 deaths. The population of Greater London was estimated at 7,766,353 in 1927 and 7,251,358 in 1911. The population of the Administrative County of London and City of London was 4,483,523 in 1921, as compared with 4,521,685 in 1911. The largest cities in the United Kingdom are:

ENGLAND			Per cent
	1911	1921	Increase or Decrease
London	4,521,685	4,483,240	- 0.9
Birmingham	840,202	919,438	+ 9.4
Liverpool	753,353	803,118	+ 6.5
Manchester	714,385	730,551	+ 2.3
Sheffield	460,183	490,724	+ 6.6
Leeds	454,155	458,320	+ 1.2
Bristol	357,114	377,061	+ 5.6
West Ham	289,030	300,905	+ 4.1
Kingston-upon-Hull	277,991	287,013	+ 3.2
Bradford	288,458	285,979	- 0.9
SCOTLAND			
Glasgow	784,496	1,034,069	+ 31.8
Edinburgh	330,318	420,281	+ 31.2

The following table shows the population of the British Isles in 1911 and 1921 divided according to sex.

Division	AREA Square Miles	1911		POPULATION		1921	
		Males	Females	Total	Males	Females	Total
England	50,874	16,421,298	17,623,992	34,045,290	16,984,087	18,694,443	35,678,530
Wales	7,466	1,024,310	1,000,892	2,025,202	1,098,133	1,108,579	2,206,712
Scotland	30,405	2,308,839	2,452,065	4,760,904	2,348,403	2,533,885	4,882,288
Northern Ireland	5,431	602,539	647,992	1,250,531	602,539 *	647,992 *	1,250,531 *
Irish Free State	27,155	1,589,509	1,550,179	3,139,688	1,589,509 *	1,550,179 *	3,139,688 *
Isle of Man	227	23,937	28,079	52,016	27,321	32,917	60,238
Channel Islands	75	46,229	50,670	96,899	41,264	48,350	89,614
Total	121,633	22,016,661	23,353,869	45,370,530	22,691,256	24,616,345	47,307,601

\* Irish Census of 1911.

The total movement of travelers from the British Isles to non-European countries was 270,720 in 1928 and 701,691 in 1913, and the inward movement was 276,705 in 1928 and 372,618 in 1913. Of the outward passengers, 22,345 went to the United States; 54,709 to British North America; 28,714 to Australia, and 7095 to British South Africa.

**Education.** Elementary education is under the control in England and Wales of the Board of Education, in Scotland under the Committee of Council on Education, and in Ireland under the Commissioners for National Education. Elementary education is free and compulsory from 5 to 14 years. According to the census of 1921, there were 21,584 elementary schools in England and Wales with 7,150,000 pupils and 165,010 teachers, an increase over 1913,

when there were only 6,046,500 pupils and 164,152 teachers. In 1927-28 there were 20,684 total ordinary public elementary schools with accommodations for 7,063,578 pupils. In addition, in 1927-28 there were 576 schools for the blind and defective with an enrollment of 47,966 pupils, as compared with 25,704 pupils in 347 such schools in 1913. In 1928 there were 1320 secondary schools with 21,102 teachers and 449,800 pupils, while in 1913 there were only 1010 such schools with 13,790 teachers and 174,423 pupils. A similar increase was recorded in teachers' training colleges, of which there were 86 in 1913 with 11,876 pupils, and in 1921, 92 with 15,451 pupils. In 1928 there were 4542 evening schools with 771,291 pupils, as compared with 6876 in 1913 with 798,881 pupils. In Scotland, there were 3426 public schools with 21,986 teachers and 860,984 pupils in 1913, and in 1926 there were 3403 schools with 24,630 teachers and 824,589 pupils.

The 10 leading universities in England are Oxford, Cambridge, Durham, London, Manchester, Birmingham, Liverpool, Leeds, Sheffield, Bristol, and Reading. In Scotland, St. Andrews, Glasgow, Aberdeen, and Edinburgh were the four leading Universities, and in Ireland, Trinity College (Dublin), Queens University (Belfast), University College (Cork), University College (Galway), and University College (Dublin), were the five leading institutions of higher education. The enrollment in such schools in the British Isles in the years 1913-14 and 1927-28 was as follows:

	Professors		Students	
	1913-14	1927-28	1913-14	1927-28
England	2,533	3,730	24,010	33,295
Wales	156	378	1,140	2,814
Scotland	564	898	7,550	11,557
Ireland	532	325	2,475	3,150 *
Total	3,785	5,108	35,175	50,615

\* Irish Free State.

**Agriculture.** In 1928 there were in the United Kingdom (excluding Northern Ireland) 13,320,000 acres of arable land, or about 24 per cent of the total area; 16,961,000 acres of permanent grass and pasture, much of it highly productive; and 14,923,000 acres of rough grazing land. Stock raising, including even sheep raising, is carried on by intensive methods. In 1928 there were 7,488,588 cattle, 3,166,547 swine, 23,068,314 sheep, and 1,204,198 horses in England, Scotland, and Wales. The production of wool in the United Kingdom, including Northern Ireland, amounted to 104,821,000 pounds in 1920 and 117,676,000 pounds in 1927. The greater part of the food supply is imported. The following table gives the leading items in pre-war and post-war agricultural pursuits.

Crop	CROPS: AREA, PRODUCTION, AND YIELD PER ACRE (ENTIRE UNITED KINGDOM)									
	Area (thousands of acres)				Production (thousands of units—bushels, except as indicated)				Yield per acre (bushels)	
	1909-1913	1921-1925	1926	1927	1909-1913	1921-1925	1926	1927	1921-1925	1927
Wheat	1,852	1,808	1,652	1,706	58,329	60,599	51,000	55,768	33.5	32.7
Barley	1,682	1,513	1,272	1,171	57,977	52,017	47,906	44,551	34.4	38.0
Oats	3,341	3,369	3,123	2,966	162,258	163,759	177,291	155,930	48.6	52.6
Potatoes	746	813	794	813	173,514	190,384	176,617	183,344	234.2	225.5
Turnips and swedes	1,814	1,381	1,204	1,133	26,292 *	18,556 *	18,752 *	15,276 *	13.4 *	13.5 *
Hops <sup>b</sup>	31	26	26	23	33,023 *	34,787 *	37,184 *	28,616 *	1,338.0 *	1,244.2 *
Flax <sup>c</sup>	43	37	31	26	19,148 *	12,336 *	13,498 *	9,976 *	333.4 *	383.7 *

\* Unit, long ton.

<sup>b</sup> England and Wales.<sup>c</sup> Unit, pound.<sup>d</sup> Northern Ireland only; very little is raised in Great Britain.

**Mineral Production.** The principal economic resource of the United Kingdom is coal, which serves as fuel not only for industry, but also for the British merchant marine and as a return cargo for vessels entering British ports. It was one of the principal articles in export trade, for production was in excess of home consumption. Recent years have been difficult because of the war demands and the subsequent period of depression. The record year for production of coal was 1913; from then a gradual decline was recorded until 1918, which was followed by two years of slight increase, but in 1921, because of the strike which lasted 88 days, a very low record of production was shown. The years 1922 and 1923 showed decided improvement; 1923 was the second highest year on record. Employment in the mines followed somewhat similar lines, except that the lowest number employed was in 1915 and the greatest in 1920. The year 1921 was difficult for miners; they were out on strike for nearly three months because of wage disputes. The trouble finally ended in an agreement to base wages on the cost-of-living index and the volume of business. In January, 1924, general dissatisfaction with this wage agreement resulted in ballot vote by the miners to serve the required three months' notice of termination. In 1926 there was a general strike which severely restricted domestic and foreign commerce. See below, under *History*. The year 1927, opening with great mining activity and remunerative trade, was marked later by intense competition, declining price levels, increasing unemployment, and general depression. The closing months of 1927 and the first part of 1928 witnessed a tendency toward basic reorganization of the industry, with centralized control of production, sales, and price levels.

The accompanying table gives a comparison of industrial production in the United Kingdom before and after the World War:

INDUSTRIAL PRODUCTION							
Product		1913	1923	1924	1925	1926	1927
Coal	1000 long tons	287,430	276,001	267,118	243,176	126,279	255,417
Iron ore	"	15,991	10,882	11,057	10,146	4,096	11,207 *
Salt	"	2,248	1,880	2,039	1,926	1,722	1,976 *
China clay, etc.	"	1,141	982	1,087	1,114	1,058	997 *
Oil shale	"	3,280	2,861	2,857	2,465	1,960	2,047 *
Limestone	"	12,741	11,448	12,844	13,126	11,077	14,411 *
Sandstone	"	3,666	2,365	2,692	3,041	3,124	3,131 *
Slate	"	871	264	288	306	300	298 *
Igneous stone	"	7,098	7,114	7,872	8,730	8,692	8,468 *
Pig iron	"	10,260	7,441	7,307	6,262	2,442	7,350
Steel ingots and castings	"	7,664	8,482	8,201	7,385	3,560	9,200
Cotton deliveries to spinners <sup>b</sup>	1000 bales	4,288	2,672	2,709	3,328	3,082	3,144
Boots and shoes	1000 pairs	.....	100,490	111,383	113,535	114,601	114,900
Spirits, alcoholic	1000 proof gallons	51,802	36,137	37,323	38,028	37,759	37,323
Beer	1000 barrels	37,559	23,949	25,425	26,735	26,766	25,100
Shipbuilding, vessels launched	1000 gross tons	1,932	646	1,440	1,085	640	1,226

\* China clay only.

<sup>b</sup> Years ended July 31.

\* Figures for Great Britain and Isle of Man.

Industrial productivity was greatest in the first and—except in food, drink and tobacco—the last quarters of 1928. The output of manufacturing plants, mines, and quarries was slightly less than in 1927.

**Textile Industry.** The cotton and woolen industries of Great Britain are located near the coal fields, the linen industry mainly at Belfast and Dundee, the lace industry at Nottingham, Derby, and Kilmarnock, and hosiery factories at Derby, Leicester, and Nottingham. The cotton industry depends entirely on imports of raw materials, while the woolen industry has to import two-thirds its wool, and the linen industry has to import one-half its flax. The cotton industry suffered more serious disorganization by reason of the World War than any other industry. A large part of the cotton spinning and manufacturing machinery of France and Belgium was in the zone of hostilities, while the cotton factories of Russia were ruined in the early months of the revolution, and England suffered a lack of raw material because of the submarine danger. Following the Armistice, England, with all her machinery intact, enjoyed a period of prosperity. Toward the close of 1920, the boom ended, and a serious depression set in, from which the industry had not recovered by 1929. During 1923 the short crop in America, plus the increased consumption by American mills, helped to cause a rapid rise in prices of raw materials. Economic disturbances in the chief markets of British cloth, i.e., China and India, caused them to cut down their purchases. In July, 1929, nearly 2000 cotton mills in the Lancashire district were shut down as a result of the walkout of 500,000 employees who refused to accept a wage reduction of 12½ per cent.

**Shipping and Shipbuilding.** The shipping and shipbuilding trades were prosperous during the War. After the signing of the Armistice, this abnormal demand ceased, and an excess of tonnage was the immediate result. The lack of

demand for tonnage caused rates to fall, which, added to the fluctuating exchanges and unsettled economic conditions, caused considerable hardship to shipowners. The excess tonnage was further augmented by the tendency to convert many old vessels to the Diesel type, which gave more cargo space and less fuel space. The United Kingdom leads the world in size of merchant marine, which in 1913 consisted of 8514 steam vessels of 18,273,944 tons and 700 sailing vessels of 422,203 tons, or a total of 9214 vessels (over 100 tons) of 18,696,237 tons; and in 1927 it was made up of 8216 vessels (of over 100 tons), totaling 19,309,022 net tons. During the War, there were lost through enemy attack 2197 vessels of 7,638,020 tons. In 1928 there were launched 830 vessels of 2,661,405 gross tons as compared to 728 vessels of 2,237,506 gross tons in 1927. The table shows the entrances and clearances at ports in the United Kingdom for 1913 and 1927:

	Entrances		Clearances	
	1913	1927	1913	1927
Number of vessels	78,620	76,440	76,648	76,312
Capacity (1000 net registered tons)				
Total	82,149	90,442	82,661	91,297
With cargo	49,064	60,500	67,819	63,500
In ballast	33,085	29,852	14,842	27,797

\* Figures for 1926

The total net tonnage of entrances at ports of the United Kingdom with cargoes during 1928 was 60,330,721; total clearances were 64,448,551 net tons.

**Railways.** The railroads of Great Britain are divided into four systems, all privately owned. The statistics for these are given in the accompanying table. In addition, there are 765 miles of line in Northern Ireland not covered by the table.

The number of passengers carried in 1928 was 1,190,420,000. During the year, the railways fell £9,057,732 short of earning the standard revenue fixed by the Railway Rates Tribunal under the Railway Act of 1921.

Gross receipts for the year were £205,726,461 as compared to £214,785,989 for 1927. Total expenditures dropped to £168,876,915 in 1928 from £175,888,185 in 1927. The total net income was £41,000,115 in 1928 and £42,622,190 in 1927. The decreases in revenue were attributed to motor competition and the freight shortage resulting from industrial depression.

**Commerce.** The outstanding feature of the overseas trade of the United Kingdom in 1928 was the continued improvement in the visible adverse merchandise balance. As a result of decreased imports and increased exports of British goods, the total adverse merchandise balance for the year was £353,160,000, a decline of £33,148,000 from the 1927 figure and the lowest since 1924. The annual net excess of visible imports over visible exports is a common and expected characteristic of British overseas trade. The trend of United Kingdom imports, exports, and reexports, and the net balance of visible trade, with movements of bullion and specie omitted, may be seen from the accompanying table.

Imports into the United Kingdom are grouped into five classes, in which the value figures for 1928 show declines from 1927 in imports of food, drink, and tobacco, raw materials, and manufactured goods, but increases in the receipts of parcel-post goods and of animals not for food. When compared with 1924, the new base year for trade and industry comparisons in the United Kingdom, marked declines are shown in the first two classes, while increases equally marked are shown in the remaining classes.

#### STATISTICS OF RAILWAYS (Great Britain only)

	1913	1923	1924	1925	1926	1927
Length of line	20,246	20,314	20,329	20,391	20,396	20,400
Length of track	50,604	51,818	51,967	52,233	52,332	52,458
Locomotives	24,664	24,231	24,288	24,209	24,045	24,008
Passenger cars	55,024	51,015	51,238	50,823	51,210	51,400
Freight cars	735,294	714,246	718,613	721,359	720,860	718,238
Passengers carried	1,550	1,772	1,747	1,743	1,541	1,650
Freight carried	364,424	343,267	335,497	315,951	215,597*	325,408
Ton miles <sup>b</sup>	18,961	19,063	18,332	14,042	14,042	18,847
Train-miles	155,365	143,115	143,791	141,076	112,894	144,115
Gross receipts <sup>c</sup>	£1000	119,808	205,814	203,417	199,653	171,852
Passenger service		54,526	94,080	95,111	94,079	85,121
Freight service		64,255	109,757	106,402	103,676	85,044
Gross receipts, equivalent \$1000		583,047	941,559	898,513	964,104	834,893
						976,089

\* Exclusive of livestock.

<sup>b</sup> Standard gauge only.

<sup>c</sup> Including miscellaneous receipts not shown separately.

#### UNITED KINGDOM FOREIGN TRADE VALUES

Year	Imports (c. i. f. value)	Exports (f. o. b. value)	Reexports (f. o. b. value)	Net excess of imports
1925	£1,320,715,190	£773,380,702	£154,036,799	£393,297,689
1926	1,241,361,277	653,046,909	125,494,968	462,819,400
1927	1,218,341,150	709,081,263	122,952,839	386,307,048
1928	1,106,940,354	723,427,455	120,352,491	353,160,408

#### C. I. F. VALUE OF IMPORTS INTO THE UNITED KINGDOM BY CLASSES

Class	1924	1927	1928
Food, drink, and tobacco	£571,085,943	£538,526,621	£531,912,557
Raw materials and articles mainly unmanufactured	400,019,414	851,739,719	334,819,690
Articles wholly or mainly manufactured	299,773,852	322,412,540	318,016,455
Animals, not for food	2,569,834	2,853,196	3,064,520
Parcel post (non-dutiable articles)	3,990,101	3,009,074	9,127,132



The principal countries supplying the 1927 import requirements of the United Kingdom, with the preliminary valuation for each in comparison with the revised figures for 1925 and 1927, are listed in the accompanying table:

£307,000,000, as compared to only £19,000,000 in 1913-14. The budget was balanced at approximately £200,000,000 in 1913, but due to heavy war charges it was balanced at £1,000,000,000 in 1921, at £900,000,000 in 1922, at £800,000,000

## PRINCIPAL SOURCES OF IMPORTS INTO THE UNITED KINGDOM

Country of origin	1925		1927		1928	
	Value	Per cent of total	Value	Per cent of total	Value	Per cent of total
United States	£245,277,995	18.6	£200,186,487	16.4	£188,660,389	15.7
Argentina	68,856,044	5.2	76,495,859	6.3	76,785,099	6.4
British India	80,099,083	6.1	65,840,065	5.4	64,491,282	5.4
France	65,042,372	4.9	63,438,377	5.2	60,642,770	5.0
Germany	48,403,494	3.7	59,915,951	4.9	63,731,140	5.3
Canada	70,585,661	5.4	55,151,649	4.5	57,110,479	4.8
Australia	72,837,109	5.6	52,739,869	4.3	54,469,264	4.5
Denmark	49,053,974	3.7	49,973,366	4.1	53,056,400	4.4
New Zealand	51,331,282	3.9	46,549,306	3.8	47,314,931	3.9
Irish Free State	43,381,726	3.3	43,247,137	3.6	45,144,483	3.8
Belgium	35,556,819	2.7	46,524,295	3.8	43,854,987	3.6
Netherlands	45,597,995	3.5	44,506,225	3.7	42,914,975	3.6
Egypt	84,201,873	2.6	23,680,760	1.9	26,297,463	2.2
Union of South Africa	25,122,993	1.9	21,415,437	1.8	24,245,320	2.0
Sweden	21,326,977	1.6	25,258,812	2.1	22,045,334	1.8
Russia	25,322,033	1.9	21,051,633	1.7	21,548,237	1.8
Spain	19,897,102	1.5	18,788,928	1.5	18,287,135	1.5
Italy	19,289,254	1.6	16,775,618	1.4	15,763,764	1.3
Switzerland	18,965,806	1.4	14,411,285	1.2	14,368,832	1.2
Ceylon	17,040,283	1.3	16,642,857	1.4	18,830,286	1.2
Finland	13,213,975	1.0	15,895,432	1.3	13,237,099	1.1
Norway	12,978,471	1.0	12,923,453	1.1	12,008,471	1.0
China	13,447,620	1.0	12,123,145	1.0	11,978,420	1.0

The real increase in British exports over 1927 is somewhat more than is apparent in the total figures, owing to a further slight reduction in wholesale prices.

in 1923 and at approximately £756,083,000 in 1920.

The table on page 662 shows total receipts and expenditures. Prior to 1928-29, the accounts

## F. O. B. VALUE OF EXPORTS OF UNITED KINGDOM GOODS

Class	1924	1927	1928
Food, drink, and tobacco	£ 56,957,520	£ 52,273,502	£ 54,271,761
Raw materials and articles mainly unmanufactured	108,481,725	76,352,169	70,168,532
Articles wholly or mainly manufactured	618,855,491	563,913,782	578,628,519
Animals, not for food	2,299,325	1,898,016	1,995,383
Parcel post	16,372,776	14,638,794	18,363,310

The direction of British export trade is indicated by the following table, showing the countries figuring most conspicuously as markets for British goods:

included gross receipts and expenditures for posts, telegraphs, and telephones, the only large income-producing service, which normally shows a net surplus; they also included the revenue

## PRINCIPAL DESTINATIONS OF EXPORTS OF UNITED KINGDOM GOODS

Country of destination	1925		1927		1928	
	Value	Per cent of total	Value	Per cent of total	Value	Per cent of total
British India	£86,047,757	11.1	£85,044,842	12.0	£83,921,446	11.6
Australia	60,189,330	7.8	61,179,266	8.6	55,698,562	7.7
United States	52,074,185	6.7	45,437,065	6.4	46,624,396	6.4
Germany	44,226,072	5.7	41,879,093	5.9	40,949,587	5.7
Irish Free State	40,217,350	5.2	36,199,867	5.1	35,135,745	4.8
Canada	27,553,090	3.6	29,250,282	4.1	34,267,590	4.7
Union of South Africa	30,747,864	4.0	30,501,754	4.3	31,674,035	4.4
Argentina	29,145,326	3.8	26,991,958	3.8	31,212,581	4.3
France	31,026,406	4.0	23,633,947	3.3	25,169,192	3.5
Netherlands	24,808,518	3.2	21,219,497	3.0	21,800,651	3.0
New Zealand	23,072,583	3.0	19,608,464	2.8	19,286,967	2.7
Belgium	18,667,080	2.4	16,471,444	2.3	17,003,432	2.4
Brazil	16,155,044	2.1	14,388,564	2.0	16,031,072	2.2
China	14,633,399	1.9	9,689,977	1.4	15,717,511	2.2
Japan	16,237,378	2.1	15,150,476	2.1	14,539,445	2.0
Italy	18,835,444	2.4	13,487,719	1.9	14,354,081	2.0
Straits Settlements	11,569,242	1.5	11,404,760	1.6	11,439,520	1.6
Egypt	16,424,231	2.1	12,564,387	1.8	11,185,978	1.5

**Finance.** One of the most striking achievements of the British government after the Armistice was the very large reduction in government expenditures and the balancing of the budget. In contrasting the large post-war expenditure of the British government with the pre-war rate, it should be borne in mind that the annual debt charge was, by 1924, about

from motor-vehicle duties and its expenditure on the road fund. The 1928-29 budget estimates show only the net receipts for posts, telegraphs, and telephones and only the exchequer share of motor-vehicle duties, deducting the road fund. Educational expenditure is mainly for grants in aid to local education. "Payments to local taxation accounts" include certain liquor and

other licenses and a share in the estate taxes assigned for local use. Conversions to dollars have been made at par.

insurance, and unemployment "doles" for workers, labor exchanges, an extension of workmen's compensation, practical abolition of plural vot-

GOVERNMENT RECEIPTS AND EXPENDITURES  
(Thousands of Pounds Sterling)

	1913-14, actual	1925-26, actual	1926-27, actual	1927-28, preliminary	1928-29, budget
<b>Receipts</b>	<b>198,243</b>	<b>812,082</b>	<b>805,701</b>	<b>842,224</b>	<b>756,083</b>
Customs	35,450	104,487	107,515	111,620	122,067
Excise	39,500	131,560	132,978	139,200	142,518
Estate duties	27,359	61,200	67,320	77,310	72,000
Income and super tax	47,249	327,921	300,627	311,183	292,900
All other taxes	13,381	57,376	55,493	54,108	35,750
Posts, telegraphs, and telephones (gross)	30,800	57,350	54,850	63,000	8,186*
Interest and payments from sundry loans	1,580	14,944	22,854	23,952	27,650
Receipts from civil departments, etc.	1,226	52,359	57,218	(b)	(b)
All other	1,608	2,865	2,846	62,451	55,012
<b>Expenditures</b>	<b>197,493</b>	<b>826,100</b>	<b>842,395</b>	<b>838,585</b>	<b>741,581</b>
Debt service	24,500	358,239	378,584	378,816	369,000
National defense	77,179	119,377	116,730	117,410	114,600
Road fund	1,395	17,455	17,373	19,666	(a)
Payments to local taxation accounts	9,734	14,454	14,172	15,369	14,200
Education, science and art, including local grants	19,450	48,569	53,175	(b)	49,493
Health, labor, and insurance	19,666	36,373	32,550	(b)	75,614
Other departmental services and tax collection	19,268	169,681	166,275	241,560*	110,474
Posts, telegraphs, and telephones (gross)	24,607	53,950	54,900	56,800	(c)
All other	1,694	8,012	8,636	8,934	8,200
Equivalent (\$1,000) at par:					
Receipts	964,750	3,951,900	3,920,944	4,101,603	3,679,478
Expenditures	961,100	4,020,216	4,099,515	4,080,974	3,608,904

\* See text. † Not available. ‡ Total departmental

For the fiscal year ended Mar. 31, 1928, the external debt of Great Britain amounted to £1,095,232,000 and the internal debt to £6,432,340,000, making a total of £7,527,570,000 as compared with £7,554,618,000, at the end of the previous fiscal year. The total floating debt, at £689,000,000 on Mar. 31, 1928, marked the lowest point reached since the War.

### HISTORY

**The Coming of the War.** So vitally important to the British Empire were the many changes of the World War and immediate post-war years that they may rightly be considered as comprising one of the most significant periods in British history. Not only was the Empire itself saved from disruption by a hair's-breadth but great constitutional changes which in times of peace would have required generations were effected almost at a stroke. The enfranchisement of women, the granting of Irish home rule, the advent of a socialistic Labor government, the transformation of the empire into a "commonwealth of nations," the strides toward nationalism in India and Egypt, were changes sufficient to make any epoch memorable. With all these liberal developments, the War at the same time brought gratification to the imperialists by greatly extending the area of British rule and raising the name and prestige of Britain to the highest point it had ever reached.

Most of the internal changes were indeed presaged by the semi-revolutionary character of events in the decade preceding the War. The Liberals were in power during the whole of that period, first under Campbell-Bannerman and then under Asquith, with a parliamentary backing (1910) of 270 Liberals, 84 Irish Nationalists, and 42 Laborites as opposed by 274 Unionists. They had passed an Irish Home Rule Bill through the Commons three times by 1914, drastically altered the Constitution by curbing the House of Lords, enacted a land reform measure aimed at the very basis of the traditional aristocratic social system, provided for old-age pensions, a minimum wage for miners, sickness

services and tax collection

ing, and other social and political reforms. But all these changes had not been effected without stirring British society to its depths.

By July, 1914, just before the war clouds broke, the political atmosphere of Britain was tense and electric. Suffragettes were attempting to win the franchise by violent demonstrations; London was in the throes of a building trades strike; titled landlords were nervously preparing for the final conflict over land reform; the stalwarts of the House of Lords were predicting dire civic convulsions if the cabinet should carry out its announced intention of promulgating the Irish Home Rule Bill and the Welsh Church Disestablishment Bill, which, having passed the Commons a third time by the spring of 1914, could now, under the Parliament Act, be presented for royal signature regardless of the Lords' opposition; high army officers had virtually mutinied rather than accept responsibility for maintaining order in Ulster; and in Ireland unlawfully organized volunteer armies, representing respectively the Ulster Unionists and the Irish Nationalists, were arming themselves with smuggled rifles for an apparently inevitable civil war. Indeed, blood had already been spilled in Dublin in a clash between soldiers and National Volunteers. Like leaves before a hurricane, these issues were swept into the background by the tempest which rose in the Balkan storm centre in midsummer, 1914.

**Entry into the War.** There is now hardly any question that the British Secretary of State for Foreign Affairs, Sir Edward Grey, sincerely desired to avert the catastrophe of 1914. But it seems also well established that, through secret understandings with France (1904, 1906, and 1912) and Russia (1907 and 1908) he had so tied his hands as to make British intervention in any general war virtually inevitable. Whether he could have preserved peace by taking a position more openly and unreservedly either for or against France and Russia is debatable. Though he had been warned by the German Ambassador as early as July 6 that the Serajevo incident might produce an Austro-Russian crisis, Grey waited, inertly hopeful, until July 23,

when he asked the Austrian Ambassador what action Vienna intended to take against Serbia. Although disinterested in the merits of the Austro-Serbian dispute, Grey feared Austro-Russian complications, and on July 24 proposed mediation by the four other Great Powers. While the British fleet, which had assembled on July 16 for practice manoeuvres, was ordered by the ever-watchful Churchill on July 26 to remain mobilized, Grey continued during the next nerve-racking week to urge mediation, while he urged the cabinet to decide for intervention or neutrality in the coming struggle; if neutrality, he added, some other man must be given his portfolio. But the cabinet, almost equally divided, could make no decision, and Grey was able neither to offer unqualified pledges to France nor to make unreserved threats to Germany. In fact, as late as July 29 he told the French Ambassador, Cambon, that Britain's course was still undecided; to the German Lichnowsky he issued the famous warning that "if the issue did become such that we thought British interests required us to intervene, we must intervene at once." When the German government, taking alarm, offered a pledge not to annex French territory (not including French colonies), Grey heatedly refused to "bargain away" his loyalty to France or his interest in the neutrality of Belgium. If Germany made any "reasonable" pacific proposal, and France and Russia rejected it, Britain would stand aloof, he later informed Germany; otherwise "we should be drawn in." Even on July 31, while Russia and Austria were mobilizing, while Unionist journals in England were urging intervention and the Liberal press was advocating neutrality, while Poincaré and Cambon were pleading for a definite promise of aid, Grey was still endeavoring to keep a "free hand." To a German offer to respect Belgian neutrality and the French colonies, Grey still reiterated, "We must keep our hands free." On August 2, however, Unionist leaders, Lord Landsdowne and Bonar Law, sent a letter to the Premier stating their opinion that to hesitate in supporting France and Russia "would be fatal to the honor and security of the United Kingdom." With this letter before them, the cabinet ministers authorized a promise to defend France against hostile action of the German fleet. Four ministers, strongly opposed to intervention, offered their resignations, but only two, Burns and Lord Morley, insisted on withdrawing from a government which they felt was now committed to war.

Meanwhile, the German ultimatum had been presented to Belgium, August 2, and Belgium appealed to England for "diplomatic intervention," August 3. Such was the situation on the day when Grey made his celebrated speech before Parliament in revelation of the secret Grey-Cambon correspondence of 1912 and his promise of August 2 to defend the French coast; he discussed the menace to Belgium and lightly declared, "If we are engaged in war, we shall suffer but little more than if we stand aside." Bonar Law pledged support; John Redmond, the Irish Nationalist leader, offered Ireland's loyalty; only the Labor leader, Ramsay MacDonald, seemed unconvinced. Assured of Parliamentary backing, the Government on August 4 instructed Sir Edward Goschen, British Ambassador in Berlin, to demand from Germany before midnight a pledge to respect Belgian neutrality. As expected, Germany refused, and on August 5 Pre-

mier Asquith informed the Commons that Great Britain was at war with Germany, "to fulfill a solemn international obligation" (to Belgium) and "to vindicate the principle that small nationalities are not to be crushed, in defiance of international good faith, by the arbitrary will of a strong and overmastering Power." Such undoubtedly was the feeling of many Englishmen, but it is certainly not less true that England's entanglement in the Triple Entente through imperialist bargains with France (1904) and Russia (1907) was also so strong a reason for intervening that Grey had favored intervention even before he knew that Belgium's neutrality would be violated.

Navy and army alike were prepared for the crisis. Under Admiral Sir John Jellicoe, the navy steamed forthwith to its war stations in the North Sea. When the army's small Expeditionary Force of four infantry and one cavalry divisions, which Lord Haldane, War Minister, had organized along with the Home Defence Force, was ordered to France under Sir John French in August, it was ready "down to the last gaiter button." Lord Kitchener took charge of the War Office and began to organize the volunteer "Kitchener's Army," predicting that the war would last three years. Parliament voted a war credit of £100,000,000, an army increase of 100,000 men, a navy increase of 67,000 men, government control of railways and war insurance of trade, restriction of liquor traffic, a moratorium, and other emergency measures.

Before adjourning on September 19, Parliament also passed the controversial Welsh Church and Irish Home Rule Bills, together with a suspensory act postponing their operation. Despite the latter act, Mr. Redmond in a manifesto exhorted Ireland to contribute its share of recruits for Kitchener's Army. As for the Labor Party, the pacifist MacDonald was replaced by the patriot Arthur Henderson as chairman and only a minority continued to condemn the War. Re-assembling in November, Parliament granted an additional war credit of £225,000,000, a 100 per cent increase in the income tax as well as increased taxes on tea and beer, and an addition of 1,000,000 men to the army. Continuing to give the Government full control, Parliament acquiesced when in November the management of military and naval affairs was transferred to the War Council composed of Asquith, Lord Kitchener, and Churchill, who with the aid of technical experts decided major questions of war policy. Even so, there was much blundering and more negligence by overburdened ministers, Lord Kitchener particularly insisting on bearing a load of War Office routine which bowed even his broad shoulders. The "party truce" did not prevent the Unionists entirely from pointing out the ministry's shortcomings.

With the beginning of 1915, the Government drew increasingly the fire of the critics. Failure to provide adequate munitions was particularly censured, but there were many other grievances. Inflamed by German submarine outrages in the spring of 1915 and by the Bryce Committee's report on German atrocities in Belgium, the war spirit now burned so fiercely that it demanded more severe measures against enemy aliens and a more drastic blockade of Germany. Consumers were beginning to demand rigorous price control to curb the food profiteers, and the press was restive under the censorship imposed by Sir Stanley Buckmaster's Press Bureau. Com-

plaints were made that the voluntary enlistment plan was inadequate and drew experts into the army who were indispensable in industry, while shirkers escaped.

Above all, two military fiascos brought the cabinet under fire. The Dardanelles campaign in the spring of 1915 apparently offered a possibility of decisive strategic gains and was eagerly sponsored by First Lord of the Admiralty Churchill, but according to his later contention was stultified by the vacillation and preoccupation with the western front on the part of Lord Kitchener, who had approved the plan, and by the opposition of Lord Fisher (First Sea Lord), the commanding admiral, and other naval officials. The failure at Gallipoli, so tragically short of success, not only evoked bitter criticism from the public but caused a serious rift in the War Council itself. This crisis coincided with a stormy public discussion of the shortage of munitions, provoked by the disastrous battle of Neuve Chapelle (March, 1915), in which the General Staff's hope of blasting a breach through the enemy lines was frustrated by a shortage of high explosive shells, as reported to the *Times* in May, although this report was denied by Asquith.

Up to March, 1915, the whole record of the War Office, under Kitchener's direction, with respect to the production of munitions was not a fortunate one. He had failed to organize the munitions industry effectively, to curb profiteers, to evolve a policy which would prevent strikes, to keep skilled workers from enlisting in the army. The Government's authority to take over munitions plants, granted in the Defence of the Realm Act passed in the spring of 1915, remained virtually a dead letter. In April, however, he did permit the organization of a committee to control munitions contracts, headed by Lloyd George; but a much more thorough-going change was necessary, and under pressure from the energetic Welshman, combined with the Opposition's demand and the Churchill crisis, Asquith finally consented to the formation of a coalition cabinet with a new Ministry of Munitions of which Lloyd George was appointed the head.

**The Coalition Cabinet.** The new cabinet took office in May, 1915. It contained eight Unionists, including Bonar Law in the Colonial Office, Balfour in the Admiralty (Churchill becoming Chancellor of the Duchy of Lancaster), and Austen Chamberlain in the India Office. Arthur Henderson accepted the portfolio of Education, and Sir Edward Carson became Attorney General. With characteristic vehemence, Lloyd George threw his whole dynamic personality into the task of persuading, cajoling, and coercing, if need be, employers, workers, and officials to collaborate in the supreme task of preparing the means of victory. By a Munitions of War Act (July 2), he forbade strikes and lock-outs, obtained authority to regulate wages and profits in "controlled" munitions plants, provided for the recall of skilled workers from the army, and suspended restrictive trade union rules. It was his personal influence which kept labor in line and secured the aid of experts and organizers, so that by the end of July 100,000 munitions volunteers were enrolled and 20 national factories established. In the face of criticism, he vastly expanded the output of heavy guns and other supplies and was soon vindicated, for in the later months of 1916

British artillery in France was firing as many tons of munitions in an hour as it had fired in a day during the first year.

It was Lloyd George also to whom Asquith turned in 1916, following the Easter Rebellion in Ireland, to form a plan for putting the Home Rule Act immediately into force. He proposed that six Ulster Counties should be excluded from the workings of the act during the War and that Irish representation at Westminster should be preserved only through the War period. But the Unionists denatured the proposal and the resulting failure and the repressive Irish measures which followed enabled the Sinn Féin movement to win the masses from the more moderate Nationalist tactics.

In dealing with the man-power question, the Asquith Coalition was hardly less inept. Vainly attempting the impossible task of pleasing both the conscriptionist Northcliffe press and the anti-conscriptionist trade unions, Asquith compromised at first on a National Registration Bill; then induced Lord Derby in October, 1915, to conduct a spirited voluntary recruiting campaign, reinforced with a threat to apply compulsion if this failed; then, early in 1916, put through a Compulsory Service Act, applying merely to bachelors and childless widowers between 18 and 40, excluding Ireland, and exempting clergymen, necessary war workers, sole supporters of families, conscientious objectors, and the physically unfit. Both the jingo press and the trade unions were displeased, for opposite reasons. Assailed by prominent critics in both Houses of Parliament, the Premier had to plead for the life of the Cabinet, and prepare a new compromise in April, going a step further toward universal conscription, but still with many reservations. This was so coldly received that at length, on May 3, 1916, the Government produced a Universal Military Service Bill applying to all men between 18 and 41; Ireland was still excluded, and exemptions were so numerous that the Asquith government received little applause for its tardy and hesitant conversion to universal service.

During its term of office, from May, 1915, to December, 1916, the Asquith Coalition dealt with numerous other matters. Parliament should have terminated in December, 1915, under the Parliament Act, but it prolonged itself by statute, without elections. The blockade of Germany was tightened by increasing the list of contraband commodities and finally by abandoning the Declaration of London, in June, 1916. The Joint Air Board, representing army and navy interests, was set up in May, 1916, to stimulate production of airplanes. Huge votes of credit were granted; the cost of the war increased from £2,700,000 to £3,500,000 a day in the half year from March to September, 1915, and to £5,000,000 a day in November. By March, 1916, the votes of credit for the War reached a total of £1,782,000,000. Most of this expenditure was covered by war loans, but the income tax, doubled by Lloyd George, was raised 40 per cent more by his successor, McKenna, in September, 1915; an excess-profits tax of 50 per cent was applied to war profiteers; duties on sugar, tea, tobacco, etc., were increased, and heavy taxes levied on imported motor cars, films, and other luxuries. In April, 1916, McKenna again raised the income tax, to a maximum of 5 shillings on the pound, the excess-profits tax to 60 per cent, and other taxes proportionally. In coura-

geous self-taxation during the War, Great Britain was unique and financially prudent.

The Coalition Cabinet suffered more than one defection before it finally collapsed. Sir John Simon, Home Secretary, resigned as a protest against conscription; Sir Edward Carson, in November, 1915, because of the Government's bungling Balkan policy; Winston Churchill, because he was excluded from the War Committee of the Cabinet which was formed on Nov. 11, 1915. Lord Kitchener, en route to Russia, was lost when his ship struck a mine, in June, 1916, and was replaced as War Minister by the indefatigable Lloyd George. Sir Edward Grey accepted the title of Viscount Grey of Falloden and entered the House of Lords, retaining the portfolio of Foreign Affairs, but leaving defense of the Coalition's conduct, in the Commons, to his able under-secretary, Lord Robert Cecil.

**The Lloyd George Government, 1916-18.** The fall of the Asquith cabinet was caused by the long accumulation of ineptitudes, compromises, hesitations, vacillations, some of which have been chronicled above. It was precipitated by demands for a small war cabinet instead of merely the war committee of the cabinet consisting of Asquith, Balfour, Bonar Law, Lloyd George, and McKenna which had been created in the autumn of 1915. In December, 1916, Lloyd George, backed by the *Times*, demanded supreme responsibility for a committee to consist of himself, Sir Edward Carson, Bonar Law, and a representative of Labor. Asquith refused, a cabinet crisis ensued, and Lloyd George resigned. Bonar Law, invited by the King to form a government, recommended the War Minister instead, and Lloyd George accordingly headed a new Coalition Cabinet in December, 1916. He at once created a small war cabinet of five members, to sit daily, and to have absolute control of Britain's war effort. The Premier himself, Lord Milner of South African fame, and Arthur Henderson were the controlling triumvirate, with Lord Curzon, leader of the House of Lords, and Bonar Law, leader of the Lower House and Chancellor of the Exchequer, also members but more or less preoccupied with other duties. Five new ministries were created in the larger cabinet, Shipping Control, Food Control, Air, Labor, and Pensions. Balfour took Grey's place in the Foreign Office, Sir Edward Carson the Admiralty, and Lord Derby the War Office. Other places, contrary to tradition, were filled with experts, particularly business experts, rather than politicians.

Of the Lloyd George government, great things were expected, for the name of its premier had become a synonym for patriotic energy. As budget-maker, then as Munitions Minister, then as War Minister, he had exhibited unsurpassed vigor and enthusiasm; he had stirred the Allied world by his ringing, if inelegant, declaration that the fight with Germany "must be to a finish," to "a knockout." To him, Englishmen now looked for miracles. Of these, there was none, but of vigor there was much. The German peace offer made in December, 1916, was rejected. During the remainder of the War, new conscription laws were passed, raising the age limit, combining over the supposedly exempt and unfit, and culminating in the 1918 law which drafted men up to 55 years of age and which for the first time included Ireland.

To defeat the aim of the German submarine campaign of 1917, the Government assumed con-

trol of British shipping and built new tonnage with desperate haste. For zeal in this matter there was indeed necessity, for in 1917 some 4,009,537 tons of British shipping, out of a total of 20,000,000, were sunk, as compared with only 1,163,474 built; and in the first nine months of 1918, the Germans succeeded in sinking only 1,925,512, as compared with 1,310,741 constructed. The submarine campaign, by lessening the cargo space available for food imports, threatened England with slow starvation; to avert this peril, the Government not only established food-rationing and price-regulation, but also offered bounties for domestic grain production and fixed a minimum wage of 25 shillings for agricultural labor. When reproached for not doing more, Bonar Law declared that in 1917, while putting 820,600 additional men into the army, the Government had brought 1,000,000 more acres under the plow, producing 850,000 tons of grain and 3,000,000 tons of potatoes, and had built over 1,000,000 tons of shipping, as compared with about 500,000 the previous year. Furthermore, mines, textiles, railways, and the liquor traffic were brought under governmental control, for reasons dictated by war necessity. Votes of credit, of course, became larger and more frequent as the cost of the War rose to almost £7,000,000 sterling per diem in 1917-18. The total credits granted for the War were brought by appropriations in 1918 to the stupendous total of £8,742,000,000, of which about £1,465,000,000 was lent to other Allies.

As before, the bulk of the burden was passed on in the form of debt to future generations, but Great Britain in the years 1917-18 taxed herself unflinchingly. The normal income-tax was raised to 6 shillings in the pound, with supertaxes running up to 4s. 6d.; increases were put on liquor, tea, sugar, tobacco, luxuries, postal rates, etc. Of the many measures adopted to preserve the morale of labor and industry under the stress of war, perhaps the most significant was the Whitley Reconstruction Committee's Report, June, 1917, proposing the establishment of Joint Industrial Councils representing capital and labor in each industry, to settle disputes amicably, and, more important, to nip misunderstandings and controversies in the bud. The proposal was only a recommendation, not a compulsory law, but it was voluntarily adopted in some trades, and it bore witness to the Government's desire to build for a future beyond the anticipated military victory.

Another of the Lloyd George cabinet's war measures, of far less importance in the long run, was the wholesale Anglicization of the royal family, by substituting good English names for hereditary surnames of too Teutonic a flavor; in July, 1918, the reigning dynasty, the house of Saxe-Coburg and Gotha, became the house of Windsor; a month earlier, the Prince of Teck had been ordered to change his family name to Cambridge, and the Battenbergs translated themselves into Mountbattens.

**Important Reforms.** Constitutional and political reforms of far-reaching significance were adopted in the midst of frenzied efforts to win the War, during the years 1917-18. Probably the most remarkable of these was the Representation of the People Act of January, 1918. The desire for reform of the franchise had been bruited before Asquith's fall, particularly by the suffragettes, but the Asquith cabinet, divided against itself, had been unable to



take any decided stand on the issue. The Lloyd George government took action on the basis of a report from a Speaker's committee representing all parties, and in May, 1917, presented a bill embodying the committee's proposals and allowing the Commons to do as they pleased regarding the controversial questions of woman suffrage and proportional representation. By 214 to 17, the House incorporated woman suffrage; but proportional representation it rejected, excepting for university elections. The vote was given not to all women, but to women over 30 years of age, who were qualified as local government electors by occupying land or premises of the yearly value of not less than £5, or of a dwelling house, or whose husbands occupied such property; moreover, women over 30, graduates of universities, were entitled to votes for their university representatives in Parliament. Later in the same year, a bill was passed enabling women to sit in Parliament, and in 1922 three women were elected. The complicated existing franchises for men were swept away and replaced by a simple six months' residence requirement for all males over 21 (except conscientious objectors) and sailors and soldiers (who were included at the age of 19). Plural voting was restricted; a citizen could vote for his place of business or for his university as well as his residence, but not in more than two constituencies as of old. The registration period was reduced from 12 to six months. Also all polls were to be held on the same day, in a general election. Finally, the membership of the House of Commons was increased from 670 to 707, the seats being distributed one for each 70,000 inhabitants in Great Britain, and one for each 43,000 in Ireland. It is hardly an exaggeration to describe this as the greatest of England's historic Reform Bills, for it enfranchised about 2,000,000 men and 6,000,000 women; and since only about 8,350,000 had been previously qualified to vote, the Act of 1918 almost exactly doubled the electorate.

Other reforms were brought about by the passage of the Fisher Education Bills of 1917 and 1918 for compulsory education of children, limitation on child labor in mills, free elementary and continuation public schools, pay increases for teachers, and subsidies for secondary schools. In the same busy period, Lloyd George also endeavored to solve the Irish problem, submitting in May, 1917, a plan for immediate Home Rule in southern Ireland, or as an alternative the calling of a convention to frame a better plan. Such a convention met in Dublin July 25, but the Sinn Fein refused to participate and its report was ignored by the British government, as well as the Irish parties themselves.

**Imperial Conferences.** The broader aspects of imperial statesmanship likewise challenged attention. On the invitation of the Lloyd George cabinet, the so-called Imperial War Cabinet was formed, comprising the premiers of Canada, South Africa, Australia, New Zealand, and Newfoundland, the Secretary of State for India, and the British War Cabinet. The series of sessions from March to May, 1917, were so successful that Lloyd George proposed to make them an annual affair, and a second session was called for the summer of 1918. Side by side with the Imperial War Cabinet in 1917 and 1918, an Imperial Conference met in London, embracing a wider colonial representation. The effect of these conferences was not only to knit more

closely the bonds of imperial political loyalty, but also to reinforce the tendency toward imperial economic solidarity, involving, for the mother country, abandonment of the traditional free trade dogmas. As early as February, 1917, a commercial committee headed by Lord Balfour of Burleigh had recommended additional customs duties, with colonial preference and artificial stimulation of colonial production. The Conference of 1918 recommended control of raw materials, especially minerals, and the safeguarding of essential industries, and the Unionists boasted that the principle of imperial preference was at last established. With Unionists predominating in the cabinet and in the Commons, the defense of the Liberal free trade principle against protectionism was at least made difficult. To conciliate India, the Lloyd George government permitted India to participate nominally in the Imperial War Cabinet and the Imperial Conference, permitted her to establish a protective customs duty on cotton, and permitted officials to draft a scheme for self government which from the standpoint of Downing Street was scarcely less than revolutionary. See INDIA.

Among many other ministerial changes in the 1917-18 period were the resignation of Austen Chamberlain as Secretary for India because of mismanagement by the Indian government of the Mesopotamia campaign and his later appointment as Chancellor of the Exchequer; assumption of the office of Food Controller by Lord Rhondda, in midsummer, 1917, and on his death in 1918, by a Laborite, Clynes; the recall in July, 1917, of Churchill from his services in the field as major in the Grenadier Guards to become Minister of Munitions; appointment of General Smuts of South Africa, a statesman of recognized imperial calibre, to the War Cabinet; and in April, 1918, when the Germans were making their supreme effort in France, the assumption of the War portfolio by the able Lord Milner, whose seat in the War Cabinet was taken by Austen Chamberlain.

**Victory and Diplomacy.** Meanwhile, the exhausting conflict was being pushed to a successful conclusion, thanks in no small part to the energy of the British people. Although at the outset Great Britain had sent only five divisions to France, during the entire War the United Kingdom enlisted 6,211,427 men, of whom 743,702 were killed and 1,603,262 wounded; the other parts of the Empire had supplied 3,284,943 men, of whom 202,321 were killed and 428,044 wounded. For the United Kingdom alone, the percentage of men mobilized of the total population was 13.6, as compared with 17.9 for France, 11.3 for Italy, and 5.2 for the United States. British expenditures during the War amounted to about £9,000,000,000 sterling, of which £2,730,000,000 were obtained by heroic self-taxation, about £1,360,000,000 by foreign borrowing, mainly from the United States, and the remainder, more than half, by floating war loans at home. Some £453,000,000 had been loaned to France, £382,000,000 to Italy, £659,000,000 to other Allies, and £150,000,000 to British dominions. The British national debt was over £7,000,000,000 sterling at the close of the War, 10 times its amount in 1914. Furthermore, while British Armies fought in Picardy and Flanders, in Gallipoli and Macedonia, in Palestine and Mesopotamia, and in Africa, the British Navy had policed the high seas, safeguarding supplies of troops and matériel, and

slowly starving the enemy. British propaganda and diplomacy had been influential in bringing the United States and other neutrals into the War and in preserving Allied solidarity. No statesman of the Entente was more determined than Lloyd George to fight "to the finish," and to coordinate the military efforts of the Allies.

At the Rapallo Conference in 1917, Lloyd George succeeded in having the Supreme War Council of the Allies established, but even this was insufficient, as he said in his sensational luncheon speech at Paris in November. After Clémenceau, a kindred spirit, became French Premier, he and Lloyd George were able to strengthen the Council, including staff officers in its membership, despite the opposition of Sir William Robertson, British chief of Staff, who resigned in protest. The credit of achieving a united command and making Marshal Foch generalissimo has been claimed for Clémenceau, Painlevé, Milner, Haig, and others, but to the English Premier certainly a large share must be assigned when all the evidence has been taken.

Hardly had the booming of the great guns at the front ceased when the opening salvos of an electoral campaign were fired in England. The War Parliament, elected in December, 1910, should normally have expired in December, 1915, but it had been kept alive by successive prolongations during the emergency, until a general election could be held in peace; it dissolved a fortnight after the Armistice. At last, on Dec. 14, 1918, the long-postponed election was held; a "khaki election" it was called, because, occurring a month after the Armistice, while millions were still in uniform, it was essentially a war election in spirit. The Prime Minister, hoping to obtain an overwhelming nonpartisan backing on the issue of patriotism before he entered the Peace Conference, joined with the Unionist leader, Bonar Law, in an appeal for electoral support of the Coalition and preservation of national unity in the peace negotiations. Their electoral promises, official and quasi-official, were lavish: to hang the Kaiser, obtain a bounteous indemnity (a figure exceeding \$100,000,000,000 was popularly mentioned), create a League of Nations, reduce armaments, foster agriculture, care for veterans, give tariff preference to colonies, protect "key industries," solve the Irish question without coercing Ulster, grant partial self-government to India, and reform the House of Lords. On this platform the Coalition won a sweeping victory; 478 loyal supporters were elected to sit on the Government side of the House, against a heterogeneous Opposition of 229 members.

The Labor Party, having seceded from the Coalition and increased its strength from 42 (in December, 1910) to 63, became the official Opposition. Asquith's forlorn contingent of 28 "Independent Liberals" also opposed the Government and hoped for better times. From Ireland came 25 Unionists and only seven Nationalists, since 73 seats, almost three-quarters of the Irish quota, had been captured by Sinn Féin irreconcilables, who refused to sit in the Westminster Parliament (see IRELAND). On the morrow of the elections, the Premier reorganized his ministry by transferring the Exchequer from Bonar Law to Austen Chamberlain, the Colonial Office to the indispensable Lord Milner, the Admiralty to Walter Long, War and Air to Churchill, who was still criticized for the Dardanelles disaster, Labor to Sir Robert Horne, Supply (previously

Munitions) to Lord Inverforth (formerly Andrew Weir), Ways and Communications to Sir Eric Geddes, and the post of Attorney General to Lord Birkenhead (Sir Frederick Smith). The normal practice of full cabinet sittings was not resumed until October, 1919, after the Peace Treaty was signed.

Strong in the knowledge of his secure majority—nay, spurred on by his ultra-patriotic parliamentary supporters—Premier Lloyd George entered the Paris Peace Conference of 1919 prepared to obtain Britain's full share of the fruits of victory. Forgotten now was his celebrated war-aims declaration of Jan. 5, 1918, in which, largely to conciliate Labor, he had promised that self-determination would be applied to the German colonies, and "their exploitation for the benefit of European capitalists or governments" prevented; that "reparation" should not cover an attempt to recover war costs; that the European settlement should be based on consent of the governed; that an international organization should be established to limit armaments and prevent wars. At Paris in 1919, his primary concern was to gratify the demand of British imperialists for a major share of German colonies, the demand of British taxpayers for a generous indemnity, and the demand of the British Admiralty for unrestricted sea power. After these interests were secured, he could afford to play the rôle of disinterested mediator between the French policy of *vœ victis* and the Wilsonian "Fourteen Points" (so strikingly similar to his own war aims of Jan. 5, 1918). With him he took to Paris some 200 "experts" and assistants, with as many typists and clerks, a staff sufficient to fill five hotels. His own will dominating the British delegation, strictly subordinate rôles were assigned to the other British plenipotentiaries: Bonar Law, Viscount Milner, Balfour, and Barnes. (The dominions and India were separately represented. See BRITISH EMPIRE.) As the history of the Peace Conference is told elsewhere (see PEACE CONFERENCE AND TREATIES), suffice it here to summarize the successes and failures of the British delegation.

The British Premier's warning that any peace ignoring Russia must be inadequate, his desire to effect an immediate limitation of armaments, his insistence on Germany's immediate or at least early entry into the League, his demand for punishment of the Kaiser and German war criminals, his proposal for an Anglo-American guarantee of French security, his belief that Germany should have "full access to raw materials and markets of the world" (inconsistent with his own earlier pronouncements) and be "put upon her legs once more"—all were either disregarded or balked. On the other hand, the British representatives did succeed in somewhat restricting French designs on the left bank of the Rhine; Lloyd George himself was responsible for the plebiscite on Upper Silesia; the mandate system, along with several other features of the League, was of British origin; the British dominions and India obtained separate votes in the Assembly, and an Englishman was appointed first Secretary General of the League.

As regards special British interests, Wilson was persuaded to drop the freedom of the seas from his "Fourteen Points"; reinforced by a strong telegram in April from 370 Members of Parliament, demanding reparation for Britain, the British delegation inserted marine losses and

pensions into the reparation account; by dramatic appeals from the Dominion delegates, Mr. Lloyd George frustrated President Wilson's aim of entrusting the German colonies to small powers, and obtained for South Africa a mandate over German Southwest Africa; for Australia, German Papua; for New Zealand, German Samoa; for the Empire, the phosphate island of Nauru; and for the mother country, Mesopotamia, Palestine, full ownership of Egypt and Cyprus, most of German East Africa, and parts of Togoland and Cameroon. Persia (q.v.), moreover, and the Hedjaz (q.v.), by arrangements independent of the Peace Treaty, had become practically British protectorates. If Disraeli could boast in 1878 that he brought home peace with honor, the fiery Welshman might well have vaunted a greater victory and richer spoils in 1919.

Signature of the peace treaties brought no surcease of international problems, but the contrary. After Premier Lloyd George had returned to London in 1919, there began a series of frequent meetings of the Supreme Council and conferences with French premiers, conferences which enabled the versatile Lloyd George to display his statesmanship at many a European spa—San Remo, Boulogne-sur-Mer, Cannes, Spa, Lucerne, besides London, Paris, Genoa, Brussels. Toward Germany, Lloyd George took a more lenient attitude than pleased French chauvinists; his desire to fix the reparation total at a moderate figure and his willingness to accept diminution or postponement of scheduled payments brought him into continual conflict with France; likewise in reopening relations with Russia and endeavoring to restrain the eastward course of Polish territorial greed, he collided with the pro-Polish and anti-Bolshevik Quai d'Orsay; the same Anglo-French divergence was seen in the difficult negotiations over Upper Silesia, the cession of which to Poland was urged by Paris and opposed by London; and again in the Near East the two western Powers were at odds, Britain backing the Greek adventure in Anatolia (see GREECE and TURKEY), while France covertly encouraged the Turkish Nationalists against exasperated remonstrances from London. When Premier Lloyd George in September, 1922, indiscreetly allowed publication of a manifesto not approved by his Foreign Minister (Lord Curzon), proclaiming his intention of resisting by force any attempt of Kemal's Nationalist Army to occupy the Straits zone or invade Europe, the rift in the Entente was painfully clear, for France ordered her troops to offer no resistance. Great Britain seemed about to face the Turks alone, and although an armistice was soon arranged, the British Premier's precipitate and perhaps high-handed action was resented not only across the Channel, but still more keenly in England, where it was seized on by his critics as a major reason for a change of ministry.

There were other discouragements. Persia (q.v.) refused to ratify the Anglo-Persian Treaty and turned to America for advice and capital. Mesopotamia proved rebellious and so surprisingly expensive that it became a byword in Parliament. Afghanistan (q.v.) shook off British control, negotiated with Soviet Russia, and terrified British imperialism by spreading anti-British propaganda in Asia. India, led by Gandhi, met the Montagu-Chelmsford "reform" with "passive resistance," while actual rebellion in Egypt necessitated a promise of independence.

Opposition by the dominions to a renewal of the Anglo-Japanese Alliance and by British taxpayers to the cost of naval competition with the United States, was dexterously dodged by encouraging the latter nation to take the initiative, at the Disarmament Conference in Washington in 1921-22, in proposing naval ratios and a broader Pacific pact, but a satisfactory arrangement was achieved only at the cost of abandoning Japan, accepting, nominally at least, a naval ratio on a par with the United States, promising to restore Wei-hai-wei to China, and admitting failure to curb military, air, and submarine armaments, of France particularly. Even so, the success of this conference tempted Lloyd George to sponsor a more ambitious assembly, the Genoa Conference, in the spring of 1922, whose declared aim was the economic reconstruction of Europe. But, as the uncompromising Poincaré had just become French Premier, superseding the more pliable Briand and repudiating the Anglo-French alliance project which the latter had drafted with Lloyd George, French policy at Genoa was so resolutely guided in anti-British, anti-German, and anti-Bolshevik channels that the Welshman's grandiose plans of international reconciliation and reconstruction went on the rocks, and no one except Lloyd George himself could regard the conference as more than a disheartening fiasco. The breach in the Entente Cordiale seemed irreparable at the time, and one of the arguments which ultimately overthrew the Lloyd George government was that by ill-considered opposition and by undue charity toward an undeserving Germany, the Premier had transformed a cordial understanding into irritable antagonism.

**Reconstruction Problems.** The four years following the Armistice presented domestic problems hardly less grave than the international questions which have been described. The cost of living soared in the first post-Armistice year to 225 per cent of its pre-war level: reaching its peak, 276 per cent, in October, 1920, it subsided only gradually to 195 per cent in November, 1921, and 181 per cent in April, 1922. The percentage of trade-union members unemployed was 2.4 at the beginning of 1919, but instead of decreasing, it rose to 6 before the end of 1920, attained the alarming level of 23.1 in June, 1921, and was still over 16 at the beginning of 1922. The actual number unemployed in January, 1921, was 1,060,000; in July, 1921, it was 2,170,000, plus 988,000 on short time; in March, 1923, it was 1,300,000. If figures can ever be eloquent, these must tell a tragic story of privation and hunger, of silent factories and bankrupt industrialists, of idle workmen and pauperized families losing their morale with their hope. A palliative, not a remedy, was provided by the Unemployment Insurance Bill which the Lloyd George government introduced in December, 1919, and promulgated the following August, extending previous laws and granting benefits of 15 shillings a week for involuntarily unemployed men, 12 shillings for women, for a maximum of 15 weeks a year. The very genuine hardships of unemployment and high prices made industrial unrest inevitable; and the stimulus which the Russian Revolution and Socialist parliamentary victories on the Continent gave to all labor movements was not without effect in England. In vain the Government conceded an eight-hour

day to railwaymen; in vain it enacted a law restoring trade practices; in vain it convened an Industrial Conference (February, 1919) of employers and workers, and set the Sankey Commission to investigating coal-miners' grievances. In Parliament, the Labor Opposition was inplacable; outside Parliament, strikes multiplied. A railway strike in the fall of 1919, ominous though it appeared, was settled in 10 days. Of longer duration and graver import were the coal strikes. After the Armistice, the miners demanded a six-hour day, a 30 per cent wage increase, and nationalization of the mines. Though the Sankey Commission effected a truce, wage increases being granted and a Department of Mines established, the miners by a fortnight's strike in October, 1920, gained a further increase, and again went on strike for three months in the spring of 1921. The government survived these and similar disturbances, but more than once there seemed a likelihood that by direct action the so-called "Triple Alliance" of miners', railwaymen's, and transport workers' unions would use their control of vital industries as a weapon with which to coerce the Government and enforce the demand of radicals for nationalization of mines and communications.

The increased wages of government employees, the staggering burden of unemployment insurance, the costly endeavors of the administration to relieve the grave housing shortage, the miscellaneous measures of social legislation designed to ease the pains of reconstruction, and the continuance of huge military and naval expenditures made it necessary to increase rather than diminish the weight of war taxation in 1919 and 1920, and though some reductions were made in 1921-22, taxpayers yearned for relief, and many hoped that a less ambitious Premier might also be less extravagant.

While the storm clouds of political opposition were gathering on Lloyd George's horizon, he accomplished one more of the feats of political dexterity which had earned him the not altogether complimentary soubriquet of "Welsh wizard." His earlier attempts to solve the Irish question during the War had simply made matters worse in that distracted island. Sinn Fein, having won the 1918 elections, had proclaimed an independent republic and inaugurated a guerrilla war against the British Army of occupation. As repressive decrees and reprisals seemed but to add fuel to the conflagration, the Lloyd George government in February, 1920, introduced, and in December carried, a Home Rule Bill to create two parliaments, one at Dublin and the other at Belfast, and a joint council for Ireland, with decidedly limited powers of self-government. Regardless of Sinn Fein indignation, Lloyd George endeavored in 1921 to put this law into effect, and succeeded easily in establishing the Belfast Parliament, but utterly failed in southern Ireland. Undismayed by this check, he now suddenly altered his tactics, invited the Sinn Fein leaders and the Ulster Premier to a three-cornered peace conference in London, and on Dec. 6, 1921, signed an epoch-making treaty with them, for the creation of an Irish Free State with dominion status. (See IRELAND.) This political *coup de main* will probably go down in history as one of the outstanding achievements of the long Lloyd George administration; certainly it put a new complexion on the Irish problem and

left critics breathless with surprise, if not admiration. But it did not long save the cabinet.

The Unionists in Power. As war-time passions cooled and the lustre of Premier Lloyd George's war services was dimmed with passing years, the Coalition cabinet, resting on the "khaki elections" of 1918, began to totter. In by-elections up to the end of 1921, the Coalition suffered a net loss of 13 seats. The Labor Opposition grew bolder, and Asquith began to tax the Government with reckless extravagance. The Near Eastern crisis and the rift in the Entente Cordiale were set down to the Premier's imprudence. But the *coup de grâce* was administered by the Unionist Party leaders who voted, in a caucus at the Carlton Club on Oct. 19, 1922, to withdraw from the Coalition. Lloyd George immediately, and somewhat indignantly, resigned his office in favor of Andrew Bonar Law, who proceeded to form a Unionist cabinet on party lines, including the Marquis of Salisbury, Viscount Cave, Stanley Baldwin (Chancellor of the Exchequer), Marquis Curzon (Foreign Affairs), the Duke of Devonshire (Colonies), Viscount Peel (India), the Earl of Derby (War), and other less known Unionists. Parliament was of course dissolved, October 26, as the Unionists had only a plurality in the Commons, and new elections were held on November 15. With their campaign slogans of "tranquillity and stability" (an English version of the American "normalcy"), economy, conciliation of France, and abhorrence of one-man government, the Unionists polled 5,300,000 votes and returned 344 members to Parliament, a safe majority. Lloyd George, heading his own faction of National Liberals with a few Unionists who were personally loyal to him, pointed with pride to his war record, scoffed at the desire for less vigorous statesmanship, promised economy and peace, and delivered philippics against the menace of socialism, but returned to Parliament with only 56 supporters. The Asquith Liberals, adhering to traditional policies and emphasizing free trade and economy, won 60 seats. Labor, *enfant terrible* of British politics, had scandalized and terrorized the older parties by advocating a socialistic capital levy, taxation of land values, nationalization of mines and railways, increased old-age pensions and unemployment doles, and a radical foreign policy; to the confusion of overly sanguine prophets, Labor failed to win a majority, although it did increase its delegation to 138 and polled 4,102,000 votes (as many as the two Liberal factions combined). It will be noted that, with the addition of minor groups, the total is only 615; to this figure the Commons was reduced in 1922, by excluding representatives from Southern Ireland, but retaining 15 from Northern Ireland.

With a safe majority of more than 100 votes (including some National Liberals), the Unionist government proceeded first to fulfill a campaign pledge, the enactment of a Constituent Act and the Consequent Provision Act, giving effect to Lloyd George's Irish Treaty (see IRELAND); their promulgation on Dec. 5, 1922, accomplished England's part of the bargain. When, after the holiday recess, Parliament reassembled in February, 1923, Liberal and Labor opposition relative to the Ruhr and to Mesopotamia was crushed by the ministerial steamroller, and Parliament was plunged into budgetary calculations, made more acceptable by a

reduction of sixpence in the pound on the income tax and by other tax cuts all along the line. Business was interrupted in May by Premier Bonar Law's resignation, occasioned by sickness which soon afterward caused his death (Oct. 30, 1923). His successor, Stanley Baldwin, a former business man, had earned golden opinions by his tactful negotiations in Washington for deferred payment of the British debt to the United States at reduced interest, and by his conduct of the exchequer in the preceding cabinet. Moreover, he was known to hold opinions unfavorable to French policy in the Ruhr. Retaining most of the old cabinet, Baldwin entrusted the Privy Seal to Lord Robert Cecil, who had attracted favorable attention by his statesmanlike activity in the League of Nations; Sir Samuel Hoare became Air Minister; Sir William Joynson-Hicks, Financial Secretary to the Treasury; and Sir Laming Worthington-Evans, Postmaster General. Subsequently, the Exchequer was offered to Reginald McKenna, refused by him, and given to Neville Chamberlain, in August. Baldwin as Premier found himself face to face with three major problems, all closely related. The "unemployment crisis," with 1,250,000 persons out of work five years after the Armistice, was no longer a crisis, but a chronic malady demanding remedy. The Ruhr crisis, if it could be so solved as to permit recovery of the German market, might help solve the unemployment problem, but Poincaré was adamant to Baldwin's arguments. The third problem, preferential tariff protection, was proposed by the Imperial Conference of October, 1923 (see BRITISH EMPIRE), as a remedy for industrial depression, but it proved Premier Baldwin's undoing. As Law had pledged his cabinet not to tamper with the tariff before the next election, Baldwin honorably but imprudently dissolved Parliament, Nov. 16, 1923, and ordered general elections, December 6. His party, fighting for tariff reform, polled as many votes as in 1922 but elected only 259 members. The reunited Liberals, defending Free Trade, polled 4,217,000 votes and increased their representation from 117 to 155. Labor, opposing protectionism and proposing a modified capital levy, along with other moderately socialist measures, increased its poll to 4,338,000 votes and its parliamentary representation to 191. Thus, no party commanded a majority. Instead of resigning at once, in response to the adverse referendum, Premier Baldwin waited for the new Parliament, which assembled in January, 1924, to oust him. His fate was decided by Asquith, who as leader of the reunited Liberals held the balance of power, and who concluded that the uncertainties of a Labor government were preferable to the "confusion, vacillation, and impotence" of the Unionists. Joining forces with Labor, then, he helped vote Baldwin out, the vote being 328 to 256.

**Labor in Power.** James Ramsay MacDonald, veteran Labor leader, ostracized as a pacifist in the War but welcomed back to the fold in less patriotic post-bellum days, now formed a Labor cabinet, in which he took the difficult portfolio of foreign affairs, and in which were included J. R. Clynes, former textile worker, as Lord Privy Seal and leader of the Commons; Philip Snowden, former clerk, ardent pacifist and moderate socialist, as Chancellor of the Exchequer; Arthur Henderson, former iron worker, as Home Secretary; J. H. Thomas, a Welsh trade-union-

ist, as Colonial Secretary; William Adamson, a miner, as Secretary for Scotland; Stephen Walsh, coal miner, as War Secretary; Noel Buxton, an ex-Liberal of private fortune, as Minister of Agriculture; Sir Sidney Oliver, former colonial official and Fabian Socialist, as Secretary for India, with a peerage; Brig. Gen. C. B. Thomson, one of the ablest and youngest generals, a recent convert to Labor, as Secretary for Air, with a peerage; Sidney Webb, eminent historian of trade-unionism, as President of the Board of Trade; Lord Parmoor, as President of the Council; Viscount Chelmsford, Conservative, for the Admiralty; John Wheatley, Health; C. P. Trevelyan, ex-Liberal, pacifist, recent convert to Labor, son of the distinguished historian, as President of the Board of Education; Thomas Shaw, prominent socialist, as Minister of Labor; Col. Josiah Wedgwood, for the duchy; and F. W. Jowett, for Works. Though a few opponents, notably Winston Churchill, vainly endeavored to arouse the country to the peril of a Socialist ministry, Premier MacDonald showed no inclination toward revolutionary fanaticism, but, rather, accepting the traditions of office, amiably visited the King, respected venerable ceremonials, and conducted his policy with irreproachable sobriety. His plans for more generous unemployment relief (which had cost the exchequer £170,000,000 since the Armistice) and for construction of 200,000 houses a year, to rent at 9 shillings a week each, were but extensions of established policies. The capital levy, Labor's most radical campaign proposal, was practically dropped; indeed, Premier MacDonald calmly permitted the bourgeois parties on April 1 to pass, by 325 to 160 votes, a resolution condemning the principle. In the budget presented by the Socialist Chancellor of the Exchequer, April 20, there was provision for a reduction of £40,000,000, lowered duties on tea, sugar, and coffee, discontinuance of duties on imported automobiles and films, repeal of the corporation tax, and inhabited house taxes; but not even Churchill could make social revolution out of these items. In foreign affairs, Premier MacDonald displayed a refreshing candor, coupled with frank pacifism and confessed regard for British interests. With Poincaré, he exchanged letters which on his side uttered bluntly England's objections to French armament and Ruhr policies, but also expressed a transparently sincere desire for reconciliation and cooperation. He abruptly granted recognition to Soviet Russia, February 2, for commercial reasons, as he said, though Bolshevism was repugnant to him. He announced on March 18 that he would stop fortification of the Singapore naval base, as a pacific gesture; but he insisted on customary naval appropriations. All treaties, his government promised, were henceforth to be submitted publicly to Parliament. Zaghlul Pasha's demands for the abandonment of vital points of British authority in Egypt and the Sudan received no encouragement, while in Mexico the British representative was vigorously supported in protecting British citizens. In short, his was a moderately radical, conservatively pacifist, course of action, dictated by evolutionary socialism rather than revolutionary communism, and scarcely more perturbing to "tranquillity and stability" than the pre-war social reforms of an Asquith cabinet, for all its tremulous dignity, or the dazzling political legerdemain of a



Welsh wizard, or the quietist *fainéance* of a Bonar Law, or the disconcerting protectionism of a Baldwin "business" government, all of which had been tried and found wanting in 10 memorable years.

Perhaps the chief item in Ramsay MacDonald's success in the conduct of foreign affairs was the reestablishment of the cordial understanding with France, which Curzon and Poincaré between them had almost entirely dissipated, together with the easing of Allied pressure on Germany. Through the Dawes Plan, a method had been worked out by which Germany could pay reasonable annual installments on the reparations account. But international agreement was necessary before the method could be applied. In his efforts to effect this, Mr. MacDonald found a ready coworker in Herriot, out of whose visit to London in June, 1924, grew the London Conference in the following month. Not only did this conference set the official stamp of approval on the Dawes proposals, but it led directly to the French evacuation of the Ruhr during the succeeding year and thus helped incalculably in restoring a measure of harmony to international relations. In September, Mr. MacDonald visited the League of Nations, meeting at Geneva, as a delegate. He was one of many Prime Ministers and Foreign Secretaries to attend, thus greatly increasing League prestige. The Geneva Protocol for disarmament, arbitration, and security guarantees which was adopted at this meeting grew out of an informal understanding between MacDonald and Herriot preceding the London Conference. On the question of the changing Dominion status, the Labor government preserved an open mind, but during its tenure of office, the autonomous position of the Dominions was still further emphasized by several incidents. Canada for a while held up the ratification of the Lausanne Treaty because she had had no hand in shaping it. She also insisted on separate representation at the London Conference. Ireland's request for a diplomatic representative of her own at Washington met with no opposition on the part of the Government since Canada had already claimed and received official assent to such representation. Imperial preference was defeated through the support of the Government by the Liberals, who opposed it because of its protectionist character; but the vote was very close, one provision being lost by a majority of only six. As a symbol of a continued sense of imperial unity, the great British Empire Exhibition which opened at Wembley in April was noteworthy. It was so successful that it was reopened in 1925. The imperial conference, however, was not held in the fall as scheduled, apparently because of the indifference of the Australian Premier.

In midsummer of 1924, the dying embers of the old Irish controversy were once more stirred into life by the Government's bill to create a Boundary Commission to delimit the boundaries between Ulster and the Irish Free State, Ulster having refused to appoint a member of the commission already set up in accordance with the Irish Treaty. The Unionists strenuously opposed the bill and the question was put over until autumn, when the legislation was passed by a large majority. In this as in other important matters, the support of the Liberals was constantly the deciding factor. As long as the Government held to a moderately Liberal course, it was reasonably assured of this support; but the

situation was precarious and obviously unenduring. It was the Russian question which finally brought Liberals and Laborites to the parting of the ways. Following the recognition of the Soviet government, a Russian commission visited London to arrange for future commercial relations and adjust outstanding differences, particularly that over the payment of Czarist debts to British bondholders.

Negotiations lasting for months finally resulted in a treaty, which was signed by the Prime Minister August 7. Among other provisions, this treaty paved the way for the guaranteeing by the British government of a future loan to the Soviet government. At this, the Liberals balked. It was evident that they would have combined with the Conservatives to defeat the Government on a vote on the treaty; but as it happened the break really came over a much more trivial matter, the dismissal by the Government of the case against the editor of the Communist *Workers' Weekly*, who had been indicted for sedition for an article urging the army to refuse to fight the workers of their own or other countries. The Conservatives introduced a motion of censure, which failed, but they supported a Liberal substitute calling for a commission of inquiry, and when the MacDonald government chose to make a stand on this issue it was defeated, on October 8, by a vote of 364 to 198. Mr. MacDonald recommended a dissolution of Parliament, and elections were set for October 29.

In the campaign which followed, the real underlying issue was whether the attitude of the Labor government was too sympathetic toward the Russian Communist régime. The Labor Party at its annual meeting early in October declared emphatically that it had nothing in common with the Communists; but public opinion on the whole seemed none too favorable to the party, and five days before the election it was given a decisive turn by the publication of the famous "Zinoviev letter." This letter was purported to have been written by Zinoviev, head of the Third International at Moscow, and other officials of that body, to British Communists urging a campaign of violence and sedition, the formation of a Red army, and other measures in preparation for a workers' revolution. The MacDonald government sent a sharp protest to the Soviet authorities, who immediately branded the letter as an "impudent forgery," and later investigation has left little doubt that it was such; but it had its calculated effect on the campaign, and when the votes were counted Labor was found to have been swept out of office by large majorities while the Conservatives registered an overwhelming victory. Their popular vote, 7,864,000, showed a gain of more than two millions over that of the previous election. It was significant, however, that the Labor vote also gained heavily, while the Liberals lost much ground. In Parliament, the Conservatives held 413 seats, the Laborites 151, the Liberals 40, and others 11. The MacDonald ministry immediately resigned and was succeeded by a Conservative cabinet under Stanley Baldwin, with Winston Churchill, a recent convert from the Liberal ranks, as Chancellor of the Exchequer.

**Baldwin Ministry.** The new government proceeded at once to give a distinctly Conservative stamp to national policies. The Anglo-Russian Treaty was summarily rejected. The Zinoviev letter was declared to be authentic. When Sir Lee Stack, Governor General of the Sudan and Sirdar of the Egyptian Army, was

assassinated in Cairo on November 20, the British government made the affair the occasion for tightening the British hold on Egypt and the Sudan and suppressing nationalistic agitation in Egypt. Under the term "safeguarding of industry," the Government, as charged by its opponents, began edging toward protectionism in spite of an election pledge by Mr. Baldwin that protectionism would find no place in his programme. Work was at once resumed on the naval base at Singapore. Direct participation by the government in elaborate programmes of house construction was largely withdrawn.

In the spring of 1925, Austen Chamberlain, Foreign Secretary, in positive terms rejected the Geneva Protocol. On the other hand, Mr. Baldwin in his speeches repeatedly evinced a strong desire to bring capital and labor together, and lived up to his words by restraining the extremists of his party, notably when they attempted to put through a bill prohibiting levies on trade-union members for political purposes. Within the Conservative ranks, this attitude induced a strong current of opposition, but his leadership was not seriously endangered. Meanwhile, the other two parties were likewise having their difficulties. The Liberals, following the disastrous set-back in the elections, were reduced to a small and ineffective group in Parliament. They preserved their party organization, however, electing Mr. Asquith leader despite the fact that he had been defeated for the House of Commons and had entered the House of Lords as the Earl of Oxford and Asquith. Lloyd George professed to be quite willing to serve under his leadership, but the Welshman's position in the House, his personal prestige, and especially his control of a political "war chest" of \$5,000,000 assured him of a loyal following for himself in Parliament and in the party. Late in 1925, he advanced a new land policy, consisting in effect of the nationalization of the country's arable land; but it aroused little enthusiasm either in the party or in the nation at large.

The Labor Party continued loyal to MacDonald's leadership, although the extremists for a while were in revolt. At a party conference held from September 29 to October 2, it strongly reasserted its aversion to communism. On the whole, however, the year 1925 was one of comparative political quiet. In the spring of that year, the Conservatives lost by death two men who had for decades been outstanding figures in the nation's life. On March 20, Lord Curzon, leader of the House of Lords and president of the Council, died; and on May 13, Lord Milner's full career in political life came to a close.

Among other notable events of 1925 were the return to the gold standard, announced April 28; the trial and conviction for seditious conspiracy, in November, of twelve Communists under an ancient and long moribund law; the settlement of the Irish boundary difficulty through agreement on December 3; and most important of all, the signing of the Locarno Treaties in London on December 1. The achievement of this near-epochal international agreement greatly enhanced the prestige of Austen Chamberlain, Foreign Secretary, and the King, in recognition of his services and those of Mrs. Chamberlain, made the former a Knight of the Garter and the latter a Dame of the Grand Cross. His popularity, however, suffered a severe setback in the following spring. At the March meeting of the League of Nations, called especially to admit Germany to

the League and assign her a permanent seat on the Council, Poland, backed by France, demanded a like privilege and other nations immediately set up similar claims. Germany refused membership on such terms. A long and bitter dispute ensued which even endangered the life of the League. Apparently bound by previous promises, Sir Austen Chamberlain gave his support to France and Poland and thereby brought down a storm of criticism on his head from the British public. Neither he nor the Baldwin government thought it necessary to make concessions and Parliament as usual supported them, but there was a definite loss in popular confidence in the Government's foreign policy which was never quite regained.

**Coal Strike.** In spite of the uneventfulness in domestic matters of the first year or so of the new Baldwin ministry, there was a feeling of foreboding in the air, due to the continued prevalence of unemployment and to the extremely unsound condition of the coal industry. It was the inevitable readjustment in coal mining which finally brought on one of the most dangerous crises in Britain's history and carried the country to the brink of revolution. In 1924 the coal miners refused to renew a wage agreement due to expire on April 17, and after intervention by the Government, owners and workers formed a new agreement, to run until May 1, 1925, by which the minimum wage scale was considerably raised. The higher rates of wages, however, proved to be more than the industry could stand and a joint inquiry was instituted by both parties to seek a remedy. This it quite failed to find, and in the spring and early summer of 1925, more and more mines closed down. The owners finally gave notice that the minimum wage agreement would be discontinued, and that on July 31 a new schedule of lower wages and longer hours would go into effect. The workers, through their Miners' Federation, resolutely refused to accept the proposed changes, and were supported in their stand by the trade unions and the Labor Party.

On July 25, the railway men agreed that they would not transport coal in case of a lockout after July 31. Three days later a government Court of Inquiry made a report which in many ways supported the position of the workers. With a national crisis but a few hours away, Mr. Baldwin on July 31 saved the situation temporarily by offering government subsidy to the industry to enable it to continue the prevailing hours and wages, at the same time proposing to appoint a commission to make exhaustive inquiry into the whole subject of the coal-mining industry. The amount of the subsidy as eventually provided was £19,000,000. The commission, headed by Sir Herbert Samuel, spent some five months in its investigation, and made its final report on Mar. 10, 1926. It recommended that the subsidy should be abandoned on April 30, that the 1924 addition of a minimum percentage to the basic wage should be revised downward, that a certain reduction of wages, particularly in the better-paid grades, should be effected, that existing hours of work should not be altered, that miners and owners should negotiate on a national basis, that owners' royalties, unproved coal, and coal too deep for present working should be acquired by the state, that the industry should be reorganized by amalgamations, etc., that it should continue in the hands of private enterprise.

While disagreeing with some of the recommendations, the Government on March 24 promised to put the report into effect if it should be accepted by both parties. During the ensuing month, a number of meetings and conferences were held in an attempt to arrive at a basis of settlement, but to no avail. The owners insisted on district rather than national settlements, while the miners took their stand on the three-fold platform of no increase in hours, no decrease in wages, and a national agreement. On April 15, the mine owners announced that the existing wage agreement would be terminated on May 1. The situation was made far more ominous by the manner in which other big trade unions rallied to the support of the miners. As in the year before, railway and transport workers made common cause with them and indeed went much farther than in 1925 and agreed to go out on a nation-wide sympathetic strike. They were joined by other unions whose membership was so large and whose work was so essential that the nation faced a paralysis of its whole economic life. For the workers' negotiations were carried on by the Industrial Committee of the General Council of the Trades Union Congress, to which latter body the Miners' Federation belonged. Mr. Baldwin, who had at first stood aside, felt it necessary to intervene and in the last ten days of April, he brought the miners and owners together in two meetings, but without effect.

On May 1, the strike of the coal miners went into effect. Coal mining completely stopped, although enough workers were left on duty to prevent the flooding of the mines. The supporting unions held off for the moment, but notice was given that unless a settlement was sooner reached the transport workers would stop work after May 3. In the meantime, the Trades Union Congress and the Government continued to seek for a way out. On May 1 and 2, the Industrial Committee of the General Council of the Congress was in conference with Mr. Baldwin and some of his ministers, and on the night of May 2 there seemed to be some prospect of an agreement; but while the Industrial Committee members were laying the Government's latest formula before the full General Council and representatives of the miners, they were surprised to receive a letter from Mr. Baldwin stating that all negotiations were called off until the general strike notices already sent out should be withdrawn and certain "overt acts . . . including gross interference with the freedom of the press" should be repudiated. The "overt act" referred to turned out to be the refusal at about this time of a few compositors on the *Daily Mail* to set up an editorial containing objectionable references to the workers and the strike. This action removed the last hope of averting the general strike and on the night of May 3 some 1,400,000 transport and railway workers, printers, and other skilled craftsmen joined the miners and left their employment.

**General Strike.** The reaction of the Government was swift and direct. Denouncing the general strike as not an industrial but a political effort, "a challenge," in the words of Mr. Baldwin, "to Parliament, and the road to anarchy and ruin," the Government assumed practically dictatorial powers through a proclamation of the King declaring a state of emergency. Special constables to the number of 250,000 were enrolled and the military made ready for action if

necessary. For a whole week, the tense deadlock continued, with the extremists among the radicals and the Conservatives waiting in the background, the one straining for a final showdown with capitalism, the other ready to set up a Fascist dictatorship. Yet throughout, there was on the surface a gay good humor. Almost no show of military strength was made by the Government, and there was practically no violence, no mob action, no attacks by the police. Seldom has the traditional self-control of the English shown to better advantage. The situation, of course, could not long endure; but before it reached a breaking point, the trade-union leaders in effect capitulated. When Sir Herbert Samuel presented an unofficial memorandum proposing a national board for revising wages but no wage revision without the reorganization of the industry proposed by the Royal Commission, the trade unions accepted it as a basis of negotiations.

On May 12, members of the General Council held a conference with Mr. Baldwin, and following it the announcement was made that the general strike would be called off in order that negotiations might be resumed. The strike, however, did not immediately come to an end. Many of the rank and file strongly objected to the yielding of their leaders. Employers also showed a strong disposition to refuse to take back the strikers except at the expense of previously hard-won privileges; but Mr. Baldwin threw the whole weight of his influence in the scale to prevent a further impasse and largely succeeded. By the end of May, economic activities were again functioning almost normally except as they were affected by the lack of coal, for the strike of the coal miners continued, and the country, safely past the danger of political revolution, found itself face to face with a "creeping paralysis" of industry for lack of the necessary fuel.

Week by week the economic machinery slowed down, while at the same time the miners saw their slender resources melt away. The contest became one of grim endurance between the coal-starved factories and railways and the food-starved miners and their families. The Government proclaimed its neutrality, but it soon became apparent that the influences within the ministry which sympathized with the mine owners were dominating its policy. The Commission's report was quite relegated to the background. In July, over the bitter opposition of the Labor Party, the Government put through an act permitting an eight-hour day in the coal industry, and in various other ways took action which the miners construed as unfriendly to them.

In August, however, Mr. Churchill, temporarily in charge of the strike situation, rather surprisingly championed their desire for a further conference of owners and workers, although it came to nothing. With no prospect of effective aid from the Government, the miners began drifting back to work in large numbers, and the strike practically came to an end on November 19, when a conference of the Miners' Federation recommended that district settlements should be made on the basis of certain stated principles. The action was tantamount to the admission of practically complete defeat.

So cataclysmic a disturbance as the general strike and the long-drawn-out coal stoppage could not help but be followed by a pronounced

aftermath. All three political parties felt the strain, but particularly the Liberals. With Lloyd George attacking the Government during the general strike and Lord Oxford vehemently opposing the strike, the rift in the party was almost complete. In October, 1926, Lord Oxford resigned the leadership because the party dissension made it too heavy a burden for his failing health to carry. Near dissolution, the party was revived and partially unified under Mr. Lloyd George in the following year in the face of Conservative extremism. The Labor Party was faced by a division when the radical elements took advantage of the discouragement over the failure of the strike to press for more direct and decisive measures; but Mr. MacDonald held his lines well together and there was far less revolt than might have been expected.

In the Conservative ranks, the victories over Labor only sharpened the appetite of the "die-hards" for greater triumphs. In the full flush of their success, they proposed to cripple the political and industrial power of Labor for a long time to come. Mr. Baldwin apparently was carried along on the tide. Little more was heard of his capital-and-labor conciliation policy, and the "new Conservatives" who had supported him in it practically subsided. In the first half of 1927, the Conservative effort reached its peak in two measures designed to consolidate their power once for all. The Trade Union Bill barred the general strike by making illegal any strike which had any other object than that involved in the dispute within the trade or industry concerned. The Laborites charged that such a provision would apply to all sympathetic strikes. The bill also took action against the "political levy," forbidding trade unions to collect assessments for political purposes from members without the specific consent of the members. As such levies had been the great source of revenue for the Labor Party, the bill was a direct blow at that party's effectiveness in future elections. In spite of the violence of Labor opposition in and out of Parliament, the bill became a law in July, 1927.

The other proposal, however, proved too much for even the docile Conservative majority itself to swallow. It was the long-discussed reform of the House of Lords. The plan advanced for discussion gave the House power over money legislation, equal power with the House of Commons of forcing an appeal to the country by disagreeing with a government measure, and the right to reject any bill affecting the constitution of the House of Lords itself. With certain exceptions, the members were to be either elected by their own order or named by the Crown. The effect of this reform would obviously have been to perpetuate in power a party which would serve as an effective barrier against future radicalism. Even by leading Conservatives, it was characterized as a crime against the constitution unless passed upon by the people. The opposition was so strong that the proposals were not put into the form of a bill. In other ways than through party changes did the effect of the 1926 strikes continue to be long in evidence. The adverse effect on the country's prosperity was reflected in growing unemployment, while among the miners themselves and their families, since great numbers of workers could not be put back in the mines, distress steadily deepened.

**Foreign Events.** While these critical events were going on at home, the foreign situation

was fortunately marked by a period of quiet, the chief exception being in China. In 1925 disorders in Shanghai and Canton led to the killing of a number of Chinese by British police and marines, and a great wave of anti-British and anti-foreign feeling swept over the country. A boycott of British goods in Canton and Hong-kong lasted for fifteen months and for a time almost paralyzed British trade in those cities. In Parliament and elsewhere, the Conservative government was accused of opposition to the Chinese Nationalists, who in 1926 made strikingly successful advances. In January, 1927, large forces of troops were sent to the Far East, but were eventually withdrawn.

In January, 1926, the Italian war debt to Great Britain was settled on the basis of a payment of about £4,500,000 yearly for 60 years and on July 12 Mr. Churchill and M. Caillaux signed an agreement for the payment of the French war debt, the total of which was put at £600,000,000 to be paid in 62 years. Ratification of the French settlement, however, was held up in France pending ratification of the American settlement, and was not finally accomplished until the Mellon-Béranger agreement was ratified in July, 1929. In September, the League impasse of the previous spring was removed in a way to satisfy Germany, who then became a permanent member of the League Council.

**Russian Relations.** With the far swing of politics to the Right, it was inevitable that relations with Russia should become increasingly cooler. The ruffled feelings of the Government when Russian trade unions sent in funds to support the striking miners in 1926 found an outlet in a sharp note of protest to the Soviet government. In China, the anti-British feeling, it was charged, was effectually encouraged by Russian influence. On Feb. 23, 1927, the British government complained vigorously to Moscow of anti-British propaganda. On May 12, the latent antipathy of the Conservative temper for communism and all its works flamed out in a police raid, sponsored by the Home Secretary, on the premises of Arcos, the Anglo-Russian trading company. It was later explained that the purpose of the raid was to obtain a highly important secret document taken from the War Department files. Adjoining the Arcos rooms were those of the official Russian Trade Delegation, and these rooms also were searched. The missing document was not found, but evidence of propaganda was obtained sufficient to cause the Government to announce on May 24 that diplomatic relations between the two countries would be severed and the trade agreement cancelled.

At the same time, a near crisis arose in Great Britain's relations with Egypt caused by a proposal in the Egyptian Parliament to omit appropriations for the Sirdar, or head of the Egyptian Army. The effect would have been to remove control of the army from the hands of the British. The British government protested and sent three battleships to Egypt, under whose persuasive influence the British demands were speedily accepted. Yet another discordant note in international affairs was struck later in 1927 when the three-power naval-disarmament conference held at the instance of the United States ended in utter failure.

**Disarmament Discussions.** On June 20, 1927, delegates from Great Britain, the United States, and Japan met at Geneva to seek a basis for reduction of naval forces. Within the first

few days, a deadlock between the American and British delegations developed which all further discussion could not remove, the former insisting on a "global" tonnage limitation within which each country might build the type of cruisers desired, and the latter on a definite limitation on each of the specified types of cruisers. The conference broke up on August 4 in an atmosphere of mutual recrimination. On August 26, Lord Robert Cecil, one of the British delegates, resigned from the cabinet and from his place as delegate to the League of Nations in a letter severely arraigning the Government for the spirit in which it had handled disarmament attempts, as evidenced in many instances other than the three-power conference. The Government could not make effective reply. In view of the strong and pronounced sentiment of the country in favor of disarmament and peace movements generally, the incident was a decided blow to the Government's prestige.

On the whole, however, the two years following the stirring events of 1926 constituted, on the surface, a period of comparative political quiet. Foreign relations, if infelicitously handled from the standpoint of those anxious for international good will, at least produced no serious crisis. The large parliamentary majority proved tractable. The working classes decided upon and followed out a course of industrial peace and reconciliation with employers; but beneath the surface, there were many clear signs of impending change. The high figure of unemployment, which dropped down somewhat in 1927, gradually rose again in 1928 until at the end of that year it stood at more than 1,500,000. The apparent indifference or inability of the Government to cope with the situation steadily weakened its support. Following Locarno, when the prestige of the Government in the conduct of foreign affairs reached its peak, one maladroit step after another produced ill feeling against Britain abroad and a growing body of aroused protest at home. Except in spots, the hoped-for commercial prosperity failed to materialize. Notably in the textile industries of Lancashire did the depression become marked, partly because of conditions within the industries themselves and partly because of the 1926 disturbances. Indications of dissatisfaction appeared in the by-elections to Parliament and in the municipal elections, in which Labor continued to mark up one emphatic victory after another. It became evident that, when the next general elections should be held, the Conservative majority would be at least greatly reduced if not entirely wiped out. In the meantime the party in power went ahead with legislation calculated to benefit industry. The safeguarding duties were somewhat extended, but they proved so popular with the Conservative Party members that they almost caused a party division.

In Parliament and out, the greatest pressure was brought to bear on the Prime Minister to extend these duties to additional articles, particularly iron and steel; but he took his stand on his election pledge not to introduce protection (insisting on the distinction between "safeguarding" and protection), and he could not be induced to alter it. Against a pronounced Conservative movement to make safeguarding the central tenet of the party, he put forward a "de-rating" scheme for the relief of industry. This plan proposed to remove restriction upon productive effort by greatly reducing or remov-

ing entirely the burden of taxation it was bearing. The greater part of the tax on agriculture had been removed already. It was proposed to do away with the remaining rates and to cut down the local taxes on industry by 75 per cent, with a new valuation to be made for taxation purposes. As given to the public in Mr. Churchill's budget bill of April, 1928, the plan provided for reimbursing local governments for the loss of these taxes out of a fund to be raised by a national gasoline tax. The valuation bill was duly passed and the new rates planned to come into effect in October, 1929.

Two other subjects which came before Parliament at this period aroused deep interest, although the controversy over them was not along party lines. In December, 1927, the revision of the Church of England prayer book came up for a vote. For many years the bishops had been working on changes tending to bring the prayer book in line with modern religious thought. As the existing form was prescribed by statute, Parliament was required to pass on the revision. The House of Lords readily assented, but in the House of Commons the revision failed of approval by 33 votes in the spring of 1928, and in June a modification was voted down by a majority of 46. The other measure passed without party opposition was the extension of the vote to women between 21 and 30 years of age. It became a law when it was passed by the House of Lords in May, 1928. The year 1928 saw the removal by death of two notable figures in British politics. Lord Oxford and Asquith, the veteran leader of the Liberals, ended a long and most distinguished career on February 15; and Viscount Haldane, former member of Liberal and Labor cabinets, died on August 19. The general elections which had been imminent for many months were recognized as being near at hand at the close of 1928. During the year, two developments in foreign affairs still further deepened the dissatisfaction with which the British public had come to regard the Conservative foreign policies. In May, 1928, the Government accepted the Kellogg peace-pact proposals, but over the protests of both Mr. MacDonald and Mr. Lloyd George, it added a reservation which retained freedom of action for Great Britain in certain regions where her interests were held to be vital. The peace advocates urged that such a qualification made of the pact little more than a pious gesture.

Much more serious was the attempt to establish an Anglo-French naval and military understanding which, it was charged, would actually have revived the pre-war Entente between France and England. In August, the news was allowed to leak out to the public that the two countries had agreed to pool their navies in case of war, and that England had consented to support the French contention that she should not be required to count trained military reserves in the total of her armies when questions of disarmament came up for settlement. At once, a storm of protest arose in England and in foreign countries alike. It was all in vain that Foreign Office spokesmen maintained that the arrangement was merely a harmonizing of views in preparation for the coming disarmament conference of the League of Nations. The suspicions of other nations could not be allayed and the effect on the friendly relations with the United States was particularly to be deplored. Between Great Britain and the United States, a greater



estrangement arose than had been known for a generation. The Government finally was moved in November, 1928, to make a statement which was virtually a withdrawal of the whole agreement. At the close of the year the nation's attention to politics was diverted for a time by the very serious illness of King George, who hovered between life and death for weeks but by the beginning of the new year was definitely on the mend. During the winter of 1928-29, the distress of the starving coal miners, of whom some 200,000 had been permanently left without employment by the necessary reconstruction of the coal industry, became extremely acute and made necessary radical measures of relief.

**Elections of 1929.** The elections for which the parties had long been preparing were set for May 30, 1929, Parliament being dissolved on May 10. For the three-cornered race, the parties presented characteristic appeals. Lloyd George early in March put the Laborites and Conservatives on the defensive by boldly advancing the plan for relieving unemployment by engaging in extensive national improvements to be financed by government loans. The Conservatives chiefly defended their record, but made a positive bid for support through Mr. Churchill's budget which rather startled the country by removing the duty on tea, as well as on other articles of popular use. For the Labor Party, a series of statements defined its attitude as Socialistic but not radically revolutionary. Of special interest was a manifesto on foreign policy which renounced the right of private blockade, declared for control of the seas through international agreement only, supported the principle of sanctions embodied in the League Covenant, and declared for disarmament, arbitration, and "pooled security." In March, Mr. Snowden attracted wide attention by denouncing the Balfour principle of balancing war-debt payments by Great Britain with payments made to her on war-debt accounts; but he denied any intention of repudiating settlements already made. The result of the elections was to return the Labor Party to power with a plurality but again without a party majority. In the new Parliament, it held 288 seats, as against 260 for the Conservatives, 59 for the Liberals, and 8 for other parties. The popular vote gave the Labor candidates 8,292,000, Conservatives 8,506,000, Liberals 5,178,000, Independents 251,000, and Communists 51,000.

The Liberals under Lloyd George thus once more held the balance of power, and announced that they would support a Labor government in putting through Liberal measures and pursuing a conciliatory foreign policy, but would oppose any Socialistic proposals. On June 4, the Baldwin ministry resigned and was succeeded by a Labor cabinet with Ramsay MacDonald at its head. Among the leading appointments were: Lord Chancellor, Lord Justice Sankey; Chancellor of the Exchequer, Philip Snowden; Home Secretary, J. R. Clynes; Foreign Secretary, Arthur Henderson; Colonies and Dominions, Sidney Webb; Lord Privy Seal and Deputy Leader of the House of Commons, J. H. Thomas. Miss Margaret Bondfield became Minister of Labor, the first woman ever to hold a place in a British cabinet.

The cabinet was everywhere commended as being an able one and calculated to inspire confidence. Mr. MacDonald announced that if he could prevent it, there would be no further gen-

eral elections for two years. Among his first moves to restore foreign good will was his announcement of a possible visit to the United States. In the latter part of July, 1929, he halted construction on two cruisers and two submarines at the same time that President Hoover stopped work on American cruiser construction. The way was openly being prepared for a new naval-disarmament conference. On July 29, the long-brewing difficulties in the Lancashire textile industry came to a head in a stoppage of work involving 500,000 workers and 1500 mills. The immediate cause was a reduction of 12½ per cent in wages. The expected renewal of relations with Russia was halted when negotiations were suspended because, as reported, the British government insisted on an arrangement for the payment of the Czarist debts. Despite these and other difficulties, however, the country faced the future in the middle of 1929 in a distinctly hopeful frame of mind.

**GREAT BRITAIN, COMMUNIST PARTY OF.** See COMMUNISM.

**GREAT LAKES, COMMERCE OF.** See SAULT SAINTE MARIE.

**GREBLE, EDWIN ST. JOHN** (1859- ). An American soldier, born at West Point, N. Y., and educated at the United States Military Academy. During the Spanish-American War, he served as captain and as assistant adjutant general of volunteers and in 1899 was promoted to be mayor of volunteers. In the same year, he was appointed captain in the Regular Army and was successively promoted to be major, lieutenant colonel, colonel, brigadier general (1916), and major general (1917). During the American administration of Cuba, he served as assistant to General Ludlow and to General Wood. From 1910 to 1914, he was a member of the General Staff in charge of field artillery and commanded the 6th Field Artillery on the Mexican border, from 1914 to 1916. In 1917 he was appointed commander of the 36th National Guard Division, Fort Worth Texas. In 1918 he was retired on account of disability incurred in active service.

**GREECE.** A republic in southeastern Europe. The Glücksburg dynasty was deposed on Apr. 13, 1924. The area is 49,912 square miles, according to the boundaries fixed by the treaty signed at Lausanne, July 24, 1923. This area includes Old Greece, Thrace (west of the Maritza River), and the islands, with the exception of the Dodecanese, which belong to Italy, and Imbros and Tenedos, which now belong to Turkey. The 1928 census showed a population of 6,204,684, including 1,400,000 refugees from Turkey in Asia and Eastern Thrace. The area in 1914 was 41,933 square miles; the population, 4,363,000. Most of the population belong to the Greek race. There are some Albanians, Jews, Vlacks, Slavs, and Armenians. The great majority of the inhabitants are adherents of the Greek Orthodox Church, which, by the terms of the constitution of 1864, was declared the religion of the state. Complete toleration and liberty of worship are guaranteed to all other sects, the greater part of whom are Roman Catholics and Jews. The principal cities of Greece are Athens, with 452,919 inhabitants; Saloniki, 236,526; Piræus, 265,000; Patras, 61,278; Corfu, 22,122; Hermoupolis, 21,156; Herachum, 33,404; Volos, 51,000; Canea, 26,604; Kalamata, 28,955; Cavalla, 49,980.

**Agriculture.** The principal crops, in addition to cereals, are currants, tobacco, olives, and

figs. The principal cereals grown are wheat, barley, oats, rye, and corn. The production of the principal agricultural products in post-war years is shown in the accompanying table.

Product		1921- 1925	1926	1927
Wheat	1000 bush.	9,411	11,171	13,300
Rye	"	961	1,412	1,217
Barley	"	5,688	8,136	9,396
Oats	"	4,072	5,556	4,972
Corn	"	6,694	8,131	.....
Potatoes	"	1,940	1,854	.....
Olive oil	1000 galls.	20,318	25,476	19,708
Tobacco	1000 lbs.	88,896	124,562	114,145
Currants and raisins		372,645	384,178	.....
Figs	"	39,039	32,591	.....
Cotton	"	4,780	.....	.....
Wool	"	18,000 <sup>a</sup>	14,500	17,500

<sup>a</sup> In 1925.

The estimated numbers of live stock in Greece at the end of 1927 were 270,741 horses; 135,299 mules; 328,152 asses; 947,143 cattle; 6,441,830 sheep, 5,500,000 goats; and 452,595 swine. The forest area is nearly 1,000,000 acres. The principal trees are oak, beech, Aleppo pine, and silver fir.

**Mining.** Greece possesses a great variety of mineral deposits, the most important of which are salt, lignite, iron, magnesite, iron pyrites, and santorin earth. The production of these metals during 1927 was as follows: emery, 15,848 metric tons; salt, 105,000; lignite, 143,346; iron ore, 123,310; magnesite, 84,484; iron pyrites, 100,050; and santorin earth, 127,384. (1926).

**Manufacturing.** Industry, after the War, made considerable progress in Greece, especially in the manufacture of foodstuffs, leather, textiles, and soap. A number of émigrés from Turkey, who were skilled in the carpet and rug industry, practically denuded that field in Turkey and added this industry to those already practiced in Greece. Factory production in 1927, excluding wine and olive oil, was valued at \$80,720,184 as compared with \$64,214,010 for 1926.

**Commerce.** The total value in dollars of imports into Greece and exports from Greece during 1912-13 (average), 1921 and 1927, was as follows:

	Imports	Exports	Total
1912-1913 (average)	\$32,385,000	\$25,589,000	\$57,974,000
1921	100,792,000	55,357,000	156,149,000
1927	166,346,000	79,694,000	246,040,000

Conversions for the above table were made in drachmas at par for 1912-13 (\$0.193); for 1921, 1 drachma = \$0.0592; 1927, 1 drachma = \$0.0126. In 1928 the imports amounted to 12,488,127 drachmas and exports 6,282,075. The average rate of the drachma in 1928 was \$0.013. The trade balance of Greece is generally adverse. The principal imports into Greece are agricultural products, textiles, and minerals and metals, including machinery and agricultural implements. The principal exports are agricultural products, mainly tobacco, currants, olives, raisins, and citrus fruit; minerals and metals, raw; alcoholic drinks and olive oil. The principal countries selling to Greece during 1928 were the United States, Great Britain, Italy, and Germany. The principal countries receiving exports from Greece were the United States, Germany, the United Kingdom, and Italy.

**Communications.** The length of railways in 1928 was about 1991 miles, of which 884 belonged to the Government. There were 12,009 miles of telegraph line in 1927; total telegrams

(1927), 3,719,833 inland and 995,665 international; miles of telephone line (1927), 4009. The Greek Merchant Marine in 1928 consisted of 724 sailing vessels of 58,670 tons and 517 steamers of 1,187,699 tons, with a gross tonnage of 1,028,813.

**Finance.** Gold and silver stock on hand in December, 1927, was 51,000,000 drachmas, which did not include 25,000,000 drachmas in the Bank of England. The banknote circulation at the end of 1913 was 245,893,000 drachmas. This increased to 1,909,638,000 drachmas in 1920; 2,507,638,000 in 1921; 3,099,141,000 in 1922; and stood at 4,480,482,808 June 30, 1928. The total public debt of Greece, according to official government statistics on Mar. 31, 1929, amounted to 38,168,619,208 drachmas. In return for a loan not to exceed £9,000,000 under the auspices of the League of Nations in 1927, the Greek government undertook to keep the budget aside from capital expenditures, within about 9,000,000,000 drachmas until the end of 1929-30 and to maintain a balance budget after that time. The budget for 1927-28 called for revenues of 8,830,000,000 and expenditures of 8,878,000,000 drachmas. In 1929 the Agricultural Bank of Greece was established.

**Education.** In 1926-27 there were 7619 primary schools, with 13,747 teachers and 632,833 pupils; 687 high schools with 2823 teachers and 92,735 pupils. There were 28 commercial schools with 269 teachers and 3013 pupils, 70 agricultural schools with 405 pupils, 6 commercial high schools with 20 teachers and 388 pupils, 10 military colleges with 1388 students, and 8 naval colleges with 275 students. In 1921 there were 10,131 teachers in elementary schools and 2018 in secondary schools, and two agricultural schools with 150 students. There are two universities in Athens, the National University and the Capodistria University, with 61 professors and 9799 students, a university at Saloniki, founded in 1925, with 14 professors and 65 students. There is also the Polytechnic with 22 professors and 170 students. There is an American School of Archaeology at Athens and a British School of Archaeology. A new educational census was undertaken in 1928.

**History.** At the outbreak of the World War, the Greek ruling class vacillated between two policies. King Constantine favored union with the German cause or at least a policy of neutrality. Venizelos, Premier since 1910, saw in the espousal of the Allies' cause the realization of dreams of territorial expansion. When the Dardanelles were attacked in February, 1915, Venizelos considered the occasion an auspicious one on which to throw the support of Greece definitely on the side of the Allies; but the King persisted in his opposition, and Venizelos was forced out of office and the Chamber dissolved. On the issue of intervention, his party won a clear majority in the June elections, but the Gounaris ministry nevertheless kept itself in office until August 23. Returning to power, Venizelos firmly maintained the Greco-Serbian accord, and proclaimed that a Bulgarian attack on Serbia would be followed by hostilities. When Bulgaria mobilized in September, he was ready to take Greece into the War; but the King stubbornly refused to countenance a war declaration, and aided by the Germanized general staff, he frustrated any attempts to succor Serbia, refusing to let French troops land at Saloniki.

In October, Venizelos was once more dismissed, and under the Zaimis and Skouloudis ministries the Greco-Serbian Treaty was repudiated and the tempting offer of Cyprus by the Allies refused. The King was determined to break the Venizelist opposition and once more called for a general election. In the balloting of December 19, with the Venizelists refraining from voting, the Government was accorded the confidence of the electorate and persisted, therefore, in its policy of neutrality.

The Allies, nevertheless, soon came to play an important rôle in Greek affairs. In December, 1915, an Allied force under General Sarail took possession of Saloniki, and that city served throughout the War as the seat of the Allies' operations in southeastern Europe. On June 3, 1916, martial law was proclaimed in the city. On June 21, the Allies demanded of Constantine demobilization of the army and the calling of new elections, and enforced a blockade. The Skouloudis ministry fell and on June 27 the King was forced to yield to all the Allied demands. Although Venizelos himself protested his loyalty, the Venizelist Party formed revolutionary committees for the purpose of forcing intervention, and a provisional government was actually set up. When the Greek government refused a demand of Admiral du Fournet, in command of the Allied fleet, for the surrender of a large portion of the Greek artillery (November 24), Allied forces occupied the Piræus and marched on Athens. The tone of the Allies now assumed a marked severity. A number of reparations demands were followed by a rigorous blockade and the recognition of the Venizelist provisional government at Saloniki. On Jan. 16, 1917, the Greek government accepted the terms, though the blockade continued.

The nonappearance of a German Army in Macedonia, the entry of the United States into the War, and the displacement of Briand by the more truculent Ribot in France, all contributed toward the creation of a more docile royal policy; but with or without official knowledge, the reservists continued to operate and by uniting with German agents in Thessaly seriously embarrassed the Allies' purposes. Once more the Allies coerced Greece, this time at the instance of powerful French opinion. On June 6, Jonnart made his appearance at Saloniki as commissioner for Great Britain, France, and Italy and at once despatched a note to Constantine demanding his abdication and that of his oldest son. On June 12, the King gave in and designated his second son Alexander as ruler. Known German sympathizers were banished; the ministry resigned; and on June 27 Venizelos was called to head a new government.

Thus, a revolution was effected by Allied intervention, though it is possible that Venizelos, had he gained the assent of the Entente, would have brought about the same end for his adherents at this time numbered some 50,000. On June 30, Greece formally entered the War on the side of the Allies. Under the French General Braquet, the army of 250,000 called to the colors was trained so rapidly that by 1918 they were able to give the Allies a great advantage on the southeastern front.

At the Peace Conference, Venizelos was undoubtedly the most important single eastern European figure. He pressed with vigor the Greek claims to Northern Epirus, Thrace, Smyrna, and the Dodecanese, and met at once

with an initial success in the treaty of Neuilly. By this document, western (Bulgarian) Thrace was ceded to the Allies (in trust for Greece), and Bulgaria was thus deprived of access to the Ægean. Another hope seemed well on the way to realization when Venizelos received the Allies' sanction for the despatch of a Greek force to Smyrna, nominally for the protection of the Christians (May 15, 1919). The Peace Conference looked favorably on the Greek claim to the Ægean islands and seemed disposed to grant the Greek requests for the Epirus in view of the cession of Valona to Italy by the Treaty of London of 1915.

The turn in Greek fortunes came, however, late in 1920. In spite of Turkish protests, so impressed was the Supreme Council with Venizelos and his apparent hold on the Greek people that by the Treaty of Sèvres, later discredited, Greek sovereignty was extended over eastern Thrace up to within 20 miles of Constantinople, Smyrna was provisionally assigned to Greece; and the islands of Tenedos and Imbros, as well as those in the Ægean Sea already occupied by Greece, were ceded. At the same time the Dodecanese, by agreement with Italy, were promised to Greece. Never did a statesman see his efforts crowned with greater success than did Venizelos when he quit the Supreme Council in the summer of 1920. Yet his long absence from home, and the high-handed character of the administration, the continuance of martial law, a drastic censorship, mobilization practically continuous since 1912, the effective pro-Constantine propaganda, and the general war weariness, contributed to his fall. The sudden death of King Alexander on October 25 at once made the return of Constantine the leading issue for the forthcoming election. In the light of the returns, the repudiation of Venizelos was complete. Of the Opposition, 246 were elected against 120 Liberals (Venizelists). Venizelos immediately retired from the country; a new ministry was formed under Rhallis; and King Constantine returned in triumph on December 19, after receiving an almost unanimous vote in a plebiscite.

It was inevitable that the Allies' attitude toward Greece, hitherto so favorable, should now be completely reversed. On December 3, the Supreme Council announced the withdrawal of all financial support to Greece. In the spring of 1921, largely at the instigation of the French, who feared for their own interests in Asia Minor as the Turkish Nationalist movement under Mustapha Kemal took on strength, the Supreme Council turned its attention toward a revision of the Treaty of Sèvres as far as Greece was affected. By March, it was evident that the Supreme Council meant to repudiate the cession of Smyrna to Greece. Under these circumstances, the Greeks began a war on the Nationalists on March 24 by marching on Afium-Karahissar and Eskişehir, on the line to Angora. Both cities soon fell; Eskişehir, however, was retaken on April 2 by the Turks; the first offensive thus closed without spectacular results. The war spirit in Greece reached fever pitch. Encouraged in a belief that Great Britain was actively championing their interests and that surcease from the pressing domestic problems would be found in great victories abroad, the Greeks renewed their demands for a continuance of the war. The second offensive began on June 10. A bloody battle was fought before Kutahia, July

16-17, and the Greeks occupied the town. On July 21, Eskişehir was once more entered, and the army pushed east on the road to Angora. Not until after the Greeks crossed the Sakharra in September did they receive their first check. In a 10 days' battle early in September, the Greeks were disastrously defeated and were compelled to fall back with heavy losses on the earlier Brusa-Afium Karahissar line. Thus, the year closed with practically no results.

Meanwhile at home, the newly elected Chamber had constituted itself a Constituent Assembly and was confronted by an advanced programme of political and economic reform prepared by Gounaris. It was idle to hope for any real reconstruction in view of the depletion of the treasury and the Chamber's preoccupation with the idea of indemnifying the victims of the Venizelist régime during the War. How precarious the situation was immediately became evident. With the beginning of 1922, the serious nature of affairs, little known at home and abroad because of a continuous official mendacity, began to appear. Turkish attacks on Greeks throughout western Asia Minor became frequent, and imprisonments and deaths were numerous. These atrocities were merely forerunners of the larger movements of the summer. In the last week of August, the Greek Army, inadequately commanded, was suddenly beset in the Afium-Karahissar and Eskişehir districts by an immeasurably superior Turkish force and struck a staggering blow. Panic at once ensued. Flight toward Smyrna was general, while thousands of soldiers took to their ships and made for Greece. The city of Smyrna, filled with refugees, was turned over to the Allies on September 8 and was entered by the Turks three days later. On September 14, a fire broke out in the foreign quarter and destroyed the whole section on the water front; some 100,000 were left homeless. Thus, in 15 days, the Turks had swept Anatolia free of the invaders and restored a balance that for more than a year had seemed all but lost. The Greeks were compelled to evacuate eastern Thrace as a condition for an armistice.

The reaction on home affairs was instantaneous. Beginning in the islands of Mytilene and Chios and spreading to the fleet and the soldiers in Thrace and Macedonia, the demand for Constantine's abdication gained such headway that on September 27 the King once more relinquished his throne, this time in favor of his oldest son, George. Constantine died suddenly at Palermo on Jan. 11, 1923. Until the meeting of the new National Assembly, affairs were in the hands of a revolutionary committee which, in order to gain popular approval, proceeded to an investigation of the late disaster. A report published on November 8 condemned all the anti-Venizelist governments from 1915 to 1922 and demanded the indictment of the ex-ministers, Gounaris, Stratos, Protopapadakis, Theotokis, Baltazis, Goudas, and Stratigos, on a charge of treason. A speedy trial took place, and the following, to the horror of Europe, were sentenced to death and duly executed: Gounaris, Stratos, Protopapadakis, Theotokis, Baltazis, and General Hadjianastis, commander of the forces in Asia Minor. Such an act only strengthened the hand of the French diplomats who sought to pacify Turkey at the expense of Greece. The Treaty of Lausanne, as finally signed on July 24, 1923 (see *TURKEY*), meant

the complete humiliation of Greece and the dissipation of those hopes of a greater Greece dominating the Southeast which had been the dream of politicians since the outbreak of the War. Eastern Thrace, Smyrna, the Dodecanese, were lost; those Greek nationals, some 600,000 living in Turkish territory, notably in Asia Minor, whose commercial activities added much to the wealth of the fatherland, were to be torn from their homes and settled lives and deported to Greece, in exchange for Turkish nationals.

A further blow was struck at Greek prestige when on August 29 as a result of the murder, at Janina two days earlier, of the Italian commissioners who had been at work on the delimitation of the Greco-Albanian boundary, Mussolini, presuming Greek responsibility, delivered an ultimatum to Greece which demanded official apologies, execution of the unknown murderers, and the immediate payment of 50,000,000 lire. The refusal of Greece to pay so large a sum at once led to the Italian bombardment and occupation of the island of Corfu, August 31. Greece thereon appealed to the League Council, under Articles XII and XV of the Covenant. Expressions of disapprobation in the Assembly and Council of the League, and, above all, English intercession for Greece, induced Mussolini to abandon his truculent attitude, accept terms of settlement proposed by the Council of Ambassadors, and withdraw from Corfu. Greece accepted the terms on September 9 and shortly thereafter made the required ceremonial apologies, besides depositing 50,000,000 lire as a forfeit, which was turned over to Italy after an impartial commission had reported that although not responsible for the murders, the Greek government had been negligent in proceeding against the assassins. See *ALBANIA* and *ITALY*.

International bankruptcy was merely one face of the shield; domestic affairs revealed the same deplorable breakdown. The revolutionary government, headed by Gonatas, though Colonel Plastiras was the virtual dictator, continued in control throughout 1923, maintaining its uneasy position only by the suppression of the constitutional liberties. The Venizelists, the party at the head of affairs, were hopelessly disunited; and with a lack of leadership, for both Venizelos and Zaimis were in political retirement, the country drifted helplessly. A half-hearted gesture at reconstruction was made on August 1 when the first army contingents were demobilized. In October, a revolt led by General Metaxas broke out and soon spread over the Peloponnese, and only with difficulty was the Government able to cope with it. Again popular opinion seemed to consider a republican constitution a universal palliative. The weeks preceding the general election of December 16 witnessed a revival of republican sentiment; attacks on the dynasty even appeared in the army and navy, hitherto generally loyal. The elections proved favorable to the Venizelists and the republicans; two days later George and his wife, Elizabeth, were invited to leave the country, and a regent, Admiral Koundouriotis, was installed in the palace.

The year 1924 thus saw Greece again about to commence a new and perilous journey. The Glücksburg dynasty was deposed, only temporarily, it was claimed, but quite definitely so far as public opinion was concerned; a National Assembly convened on January 2; and on January 4, Venizelos, the man to whom all Greece looked, appeared in Athens after an exile of

three years and consented first to head the National Assembly and then, on the resignation of the Gonatas cabinet, the Government itself, on January 11. To Great Britain and the United States, the new régime appeared to possess all the elements of stability, and recognition was formally accorded during the course of the month; but it seemed that Greece's well-wishers were to be doomed to eternal disappointment and that despair was to be the lot of those Greeks who were laboring to save their country from chaos. Venizelos was forced to relinquish his post because of illness, and although a cabinet completely made up of Venizelists succeeded him on February 6, it refused to permit the National Assembly to abolish the dynasty forthwith but insisted on a popular plebiscite. Venizelos himself had been won over with difficulty to the need for prompt action, and the plan of his followers to employ dilatory tactics so dispirited him that on March 4 he announced his intention to quit the country. The Republicans and the Military Party now joined forces with the result that the Government fell, on March 8, and Papanastassiou, the Republican leader, was summoned by the regent to form a new cabinet.

The Republican ministry, having obtained a vote of confidence in the National Assembly, lost no time in changing the name of the "Kingdom of Hellas" to the "Hellenic State," interdicting prayers for the royal family, and preparing in various other ways for the transition from monarchy to republic. The goal soon was attained. On March 25, while guns boomed and Athens rejoiced, the Assembly unanimously voted a resolution proclaiming Greece a republic, confirming Admiral Koundouriotis provisionally in his powers as regent, and permanently exiling the members of the Glücksburg dynasty. King George was permitted, however, to retain his title and four-fifths of his income for life. The Assembly's resolution was overwhelmingly ratified in a plebiscite on April 13, by 758,742 republican against 325,322 monarchist votes, and accordingly Premier Papanastassiou notified foreign powers that Greece had become a republic, and that Koundouriotis was henceforth to be styled Provisional President. On May 18, the draft of the new Greek constitution was made public. The most vexing problem confronting the new government was the repatriation of 1,000,000 or more Greek refugees from Asia Minor and eastern Thrace, and this might well have proved insuperable but for the yeoman work done by the League of Nations' Commission headed by Henry Morgenthau of New York. To aid in the settlement of these unfortunates on the land and in industry, a loan of £10,000,000 was floated in December, 1924, in England and America, the American share being \$11,000,000. In both countries, the loan was heavily oversubscribed. Mr. Morgenthau resigned from the commission and was succeeded by another American, C. P. Howland.

While the decisive voice of the electorate left no doubt as to its republican sentiment, it could not bring to the front a leader strong enough to establish the Republic on a firm foundation. The next few years were marked by a succession of ministries and great political uncertainty. On July 19, the Papanastassiou government fell because of the activities of General Pangalos, who in June had succeeded Colonel Condylis as Minister of War, and who was suspected of har-

boring dictatorship designs. A cabinet headed by M. Sophoulis lasted only a few months and was in turn succeeded, on October 1, by one with A. Michalakopoulos at its head. During its eight months of life, the new government worked with little success for the restoration of normal political conditions, urging especially that the National Assembly should finish drafting the new constitution. The ministry had elements of strength, but it could not command sufficient popular support to keep subversive elements in check, and it was finally driven from office in June. Pressure from military groups caused Michalakopoulos to resign on June 11, but he reconstituted his ministry and continued in office until June 25, when General Pangalos, under threat of bombardment of public buildings, forced his final resignation. Although practically a dictator, General Pangalos ruled for a while as constitutional Premier.

The new constitution came into effect on September 30, and on the same day, General Pangalos dissolved the National Assembly, declaring that it had lost the confidence of the people. New elections were promised for early in the following year. Hardly had the new government thus taken entire control of the country's destiny into its own hands before the belligerent character of the dictatorship almost brought the nation into a war with Bulgaria. On October 19, Greek forces, following an attack by Bulgarian irregulars, advanced several miles into Bulgarian territory. The League of Nations immediately responded to Bulgaria's request for intervention, and besides ordering the withdrawal of the Greek troops, later assessed penalties of 30,000,000 leva against Greece by way of damages, a settlement which Greece accepted in December.

Early in January, 1926, General Pangalos, feeling the need of sterner measures to combat the growing opposition to his rule, threw off all pretense and openly proclaimed a military dictatorship. Charging that the woes of the country were largely due to its parliamentary form of government, he abolished the constitution, ignored all political parties, and postponed the promised elections indefinitely. To preserve his power, he resorted to severe measures. The press was censored, a spy system was set up, and prominent political opponents were imprisoned and exiled in wholesale numbers. By reducing the value of the outstanding currency, he obtained a forced loan of some \$18,000,000, but the advantages to the national treasury of this revenue and of certain drastic economies were more than swallowed up by the heavy increases in military expenditures. Despite all repressive measures, the growing dissatisfaction with the new régime made itself manifest in many ways.

In March, President Koundouriotis resigned because his position had become meaningless. In the elections to choose his successor, General Pangalos offered himself as a candidate, and when his only opponent, Constantine Dimertji, withdrew, he received the bulk of the votes and claimed the result as an endorsement of his rule. After his inauguration on April 19, however, the opposition became so strong that he was forced into a policy compounded of both conciliatory and further repressive measures. On August 22, the end came with another military coup led by General Condylis. General Pangalos was arrested, and eventually impris-



oned in Crete. Admiral Koundouriotis was recalled to the Presidency and General Condylis assumed the position of Prime Minister pending the holding of new elections. In these elections, set finally for November 7, the real issue was once more the question of republic or monarchy. When the returns were in, the republican parties found themselves well in the lead in the new Chamber. It was deemed best, however, to form a coalition ministry and a cabinet containing both republicans and royalists began functioning on December 4, with M. Zaimis as Premier, General Condylis having shown his good faith by retiring according to his pre-election promise. In the midst of these changes, important treaties of commerce and friendship were signed with Yugoslavia and a convention relating to refugees' property with Turkey.

While the coalition government soothed the bitter partisan strife that had so long prevailed and otherwise commended itself, it quite failed to deal vigorously with the country's most pressing problems. Intrigues and plots by Pangalist and military elements kept the public and the Government uneasy. The financial situation was anything but satisfactory, with large deficits and an urgent need for a new refugee loan. However, in spite of several ministerial crises, the Government recorded some positive achievements. In February, the Assembly adopted an amendment to the constitution providing for a Senate of 120 members, although the new body did not actually hold its first meeting until more than two years later. On June 2, the constitution was finally ratified. In 1927 agreements were made with Great Britain and the United States in settlement of the war debts of Greece to those countries. That with Great Britain, signed in April, provided for the payment of a total of £21,444,000 in 62 annual installments, and that with the United States, concluded in December, for the payment of \$19,660,000 over a like period of 62 years. Both agreements were followed by arrangements for further loans for refugee, stabilization, and other purposes.

By the middle of 1928, economic and political conditions had become so unsatisfactory that the aged statesman, Venizelos, felt compelled to take the helm once more. For some time, he had been more or less active unofficially in helping with foreign financial negotiations, etc. On June 28, his sharp criticism of the financial policy of Kaphandaris, Finance Minister and Liberal leader, led to the fall of the Zaimis coalition cabinet. Once more at the head of the Liberal Party, Venizelos on July 4 formed a new Liberal ministry, immediately dissolving the National Assembly and ordering new elections. Threatening to resign, he overrode the President's objections to his unconstitutional action in substituting a straight majority representation for proportional representation. When the elections were held, on August 19, the overwhelming nature of his victory surprised every one, his Liberal Party capturing 225 seats out of a total of 250. Backed by such a popular mandate, he immediately set about straightening out the country's domestic and foreign affairs. On September 23, he signed, in Rome, a treaty with Italy providing for neutrality on the part of either nation when the other was attacked without provocation and for other measures of moral support in case of international difficulties. He then visited Paris and London to reassure

the governments there with respect to the new accord with Italy, and then turned to the task of establishing cordial relations with the rest of the neighbors of Greece.

On Mar. 21, 1929, a treaty of friendship between Greece and Yugoslavia was signed at Belgrade, following previous economic agreements, under the terms of which important disputes between the two countries are to be referred to the League of Nations for arbitration and minor disputes to an arbitration tribunal. Negotiations with Turkey presented more difficulties and by the middle of 1929 had resulted in no new treaty. The National Assembly on Feb. 13, 1929, adopted the Kellogg treaty outlawing war.

**GREELEY, WILLIAM BUCKHOUT** (1870- ). An American forester, born at Oswego, N. Y., and educated at the University of California and the Yale Forestry School. After 1904 he served with the United States Forest Service and was at various times inspector of forest reserves in California, supervisor in charge of the Sequoia Natural Forest, and government forester in Washington. Since 1920 he has been chief forester of the United States. During the World War, he served with the American Army in France as lieutenant colonel of the 20th Engineers and chief of the Forestry Section. He wrote many bulletins and circulars relating to forestry.

**GREEN, JULIEN** (1900- ). A French writer, born of American parents and brought up in France with a classical French education. He served in the army in the last year of the World War, and then spent two years in the United States at the University of Virginia. While there *Le Voyageur sur la terre* appeared in English in an undergraduate magazine. Later, it was published in French in the collection "Un Œuvre, un portrait." It was the story of the mental disintegration of an American boy. Green's two novels, *Mont Cindre* (1926), translated as *Avarice House* (1927), and *Adrienne Mesurat* (1927), translated as *The Closed Garden* (1928), also showed the influence of Poe and an interest in abnormal minds. These were followed in 1929 by *The Dark Journey*, which won the Harper Prize for 1929-30. He also wrote *Suite anglaise*, literary studies.

**GREEN, THOMAS EDWARD** (1857- ). An American lecturer and author, born at Harrisville, Pa., and educated at McKendree College, Princeton University, and Princeton Theological Seminary. From 1880 until 1903, he was active in the ministry of the Presbyterian and Protestant Episcopal churches at Mt. Carmel, Sparta, and Chicago, Ill., and at Cedar Rapids, Iowa. After 1903 he was lecturer and chaplain in various national organizations, foundations, and universities. During and after the World War, he was identified with the national speakers bureau, the U. S. Treasury campaigns, and with several movements for peace or war relief. Among his publications are *The Mantraps of the City* (1884); *The Hill Called Calvary* (1898); *In Praise of Valor* (1899-1900); *The War Trust* (1914); *The Truth About Japan* (1915); *Eugenic Democracy* (1917); *The Dream of the Ages* (1921); *Guarding the Outposts* (1922); *The Mason as a Citizen* (1926); *The Man of To-morrow* (1927).

**GREENE, ARTHUR MAURICE, JR.** (1872- ). An American mechanical engineer, born in Philadelphia and educated at the University

of Pennsylvania and in Germany. After serving as instructor at the Drexel Institute, he was appointed professor of mechanical engineering at the University of Missouri in 1902 and served there until 1907, when he became professor of mechanical engineering at the Rensselaer Polytechnic Institute. He remained there until 1922, when he was appointed dean of the School of Engineering and professor of mechanical engineering at Princeton. During the World War, he was a member of the National Research Council. He wrote *Pumping Machinery* (1911); *Elements of Heating and Ventilation* (1912); *Heat Engineering* (1914); and *Elements of Refrigeration* (1916).

**GREENE, FRANK LESTER** (1870- ). A United States Senator, born at St. Albans, Vt. After working in the auditor's office of the Central Vermont Railway, he turned to newspaper work, becoming reporter (1891) and editor (1899-1912) of the St. Albans *Daily Messenger*. In the Spanish-American War, he recruited a company of the 1st Vermont Infantry. He was a member of a commission to prepare amendments to the Vermont Constitution and in 1908 was delegate-at-large to the Republican National Convention. Sent to Congress in 1912 for the 1st Vermont District to fill an unexpired term, he was reelected for five terms (1913-23). He was elected to the U. S. Senate for two terms (1923-35). In 1917-23 he was a regent of the Smithsonian Institution at Washington.

**GREENE, JEROME DAVIS** (1874- ). An American banker, born at Yokohama, Japan, and educated at Harvard and the University of Geneva. He was a member of the faculty of arts and sciences at Harvard (1905-11), general manager of the Rockefeller Institute for Medical Research in New York City (1910-12), trustee and secretary of the Rockefeller Foundation (1913-17), a member of the firm of Lee, Higginson & Co., bankers of New York (1918- ), member of Higginson & Co., London (1919-25), executive secretary of the Reparation Commission at the Paris Peace Conference (1919), and a trustee and member of several prominent institutions and societies.

**GREENLAND.** With Australia classed as a continent, Greenland is the largest island of the world. It has an estimated area of 840,000 square miles, of which about 5 per cent is habitable along the ice-free coasts; the remainder is covered by an unbroken ice-cap, exceeded in extent and thickness only by that of the continent of Antarctica. In 1921 the population numbered 14,355, practically all Eskimo. This was a gain of 896 over 1911. The births and deaths of the later years showed a steady gain of natives, probably the only instance in which a primitive people has thus thriven under a civilized and alien government. Fortunately, the detached natives have come under Danish control. These form communities living in the Smith Sound region, between Cape York and Etah, and in the smaller settlement in the district of Angmagssalik on the east coast. Almost the entire population of what is commonly known as Danish Greenland is concentrated on the southwest ice-free region, facing Baffin Bay, extending northward along the coast for 1200 miles from Cape Farewell to Tasiussak. The two districts, northern and southern, are each governed by a royal inspector who has magisterial powers and is aided by assistants at the more important places. The largest settlement

in 1921 was Sydproven (901 inhabitants) and the smallest, Skansen (49) in North Greenland. These officials act under control of the Royal Greenland Board of Trade (Copenhagen) who most efficiently guard the interests and welfare of the natives. Schools, churches, and hospitals are maintained, and the Danish Eskimos are a literate, Christian people. Trade is confined to the summer months, owing to the obstructing ice. Imports from Greenland to Denmark in 1926 were 8,301,000 kroner and exports from Denmark to Greenland, 1,865,000 kroner. Trade is a state monopoly and the exports are mostly fox skins and the products of the seal fishery. Danish energy and daring had explored the fauna, flora, geology, ethnology, etc., of this vast region with a thoroughness unequalled in any other Arctic land.

In 1921 although Sweden, Great Britain, and the United States had formally recognized Denmark's sovereignty over the whole of Greenland, Norway questioned this exclusive jurisdiction which entailed economic monopoly. A convention concluded between the nations in 1924 granted trading, hunting and fishing rights on the northern part of the east coast to Norway. Danish control rests in the Royal Greenland Bureau of the Department of the Interior. The Director resides in Copenhagen. There are two inspectors, one for North Greenland at Godhavn and one for South Greenland at Godthaab. The 62 communities of the west coast are directed by natives. The Danish government maintains a benevolent attitude toward the natives, expending large sums for their education and welfare and regulating or prohibiting harmful intrusions. An interesting experiment is the establishment of a new colony in 1925 at Scoresby Sound.

On Jan. 11, 1878, the Commission for the Direction of Geological and Geographical Investigations in Greenland was established. The 70 volumes of *Meddelelser* (communications) *om Grønland*, which are published by this Commission, form an invaluable contribution to polar research. A few of the more important expeditions of recent years are as follows. In 1912 the First Thule Expedition under Rasmussen crossed Peary Land and obtained valuable botanical and zoological information. In 1912-13 the Second Swiss Greenland Expedition under de Quervain made a crossing of the ice cap. The Second Thule Expedition, 1916-17 under Rasmussen and Lauge Koch underwent great hardships in surveying the unexplored parts of the north coast. The Third Thule Expedition under Captain Hansen reached Cape Columbia. A study of Eskimo folklore was the incentive of the Fourth Thule Expedition. The 1920-23 Bi-centenary Expedition proved Peary Channel a great depression with a lake and mapped parts of the north coast. In 1926-27 Lauge Koch made geological studies on the east coast from Scoresby Sound to Denmark Harbor. In 1926 Nörlund studied Norse ruins in South Greenland and the Cambridge Expedition carried out surveys on the east coast. The University of Michigan Greenland Expeditions under Hobbs have carried on meteorological studies since 1926 and Dr. Dumbrava, at Angmagssalik, performed a similar line of research in 1927-28.

**GREENOUGH, CHESTER NOYES** (1874- ). An American university professor and dean, born at Wakefield, Mass., and educated at Harvard University where he was instructor in

English (1899-1907). In 1907-10 he was professor of English at the University of Illinois and in the latter year returned to Harvard, where he has since remained, as assistant professor of English (1910-15), professor (1915- ), acting dean of the college (1919-20), and dean (1921-27). He is the author of *A History of Literature in America*, with Barrett Wendell (1904), and *English Composition* (1917).

**GREENWOOD, ARTHUR** (1880- ). A British Cabinet official and labor leader. Educated at Victoria University, he became head of the economics department of Huddersfield Technical College and later lecturer in economics at the University of Leeds. He was assistant secretary to the Ministry of Reconstruction (1917-29); a Labor member of Parliament (1922- ); Parliamentary Secretary to the Ministry of Health (1924); and Minister of Health in the Labor Cabinet formed June 7, 1929. After serving as general secretary of the Labor party's advisory committees in 1920-21, he assumed direction of the party's research and information department. Besides works on public health questions and international relations, he wrote *The Education of the Citizen and Public Ownership of the Liquor Trade*.

**GREET, SIR BEN** (1856- ). An English actor-manager (see Vol. X). From 1914 to 1918, he produced and acted in twenty-four of Shakespeare's plays and fifteen others in the "Old Vic" Theatre, London, and then at the request of the Board of Education presented Shakespearean plays in various parts of London and the suburbs (1918-22), which were attended by more than one million school children. After 1922 he continued this movement under the sponsorship of the London County Council. He was knighted in 1929.

**GREGORY, AUGUSTA (LADY)** (1852- ). An Irish playwright (see Vol. X), a director of the Abbey Theatre in Dublin. She continued her translations from the Gaelic, and wrote many more plays: *The Rising of the Moon* (1915), *The Golden Apple* (1916), *The Dragon* (1920), *The Travelling Man* (1921), *Three Wonder Plays* (1922), *The Story Brought by Brigit: a Passion Play* (1924), *On the Racecourse* (1925), *The Workhouse Ward* (1926), *Dave* (1927), and *Three Last Plays* (1928). She also published *Our Irish Theatre: a Chapter of Autobiography* (1913), *The Kiltartan Poetry Book* (1919), and *Hugh Lane's Life and Achievement, with some account of the Dublin Gallery* (1921). For the "Celtic Renaissance," she collected and arranged *Visions and Beliefs in the West of Ireland* (1920).

**GREGORY, CHARLES NOBLE** (1851- ). An American jurist, and international lawyer, born in Otsego County, N. Y., and educated at the University of Wisconsin. In 1872-84 he practiced law at Madison, Wis. In 1894-1914, he was dean of the law schools of the universities of Wisconsin and Iowa and George Washington University and became one of the editors of the *American Journal of International Law*. His works include *The Life of Justice Miller of the Supreme Court of the United States* (1907) and *Abstracts of Cases in Lloyd's Reports of Prize Cases* (1919).

**GREGORY, JOHN** (1879- ). An American sculptor. Born in London, England, he went to the United States in 1893. After studying at the Art Students' League of New York, 1900-03, and at the École des Beaux Arts, Paris, 1904-06, he won a fellowship in the American Academy

in Rome, 1912-15. He was a pupil of George Grey Barnard and Anton Mercié. During the World War, he was with the camouflage section of the Navy department. Until 1925 he was an associate in modeling at Columbia University. His art was strongly influenced by the archaic Greek style, but not to the detriment of his own individuality. Most of his works are garden figures of originality and charm, such as "Bacchante," "Wood Nymph," "Orpheus and Dancing Leopard," a powerful group; and most exquisite of all, "Philomela," in the possession of Payne Whitney, Long Island (replica in Metropolitan Museum, New York City).

**GREGORY, JOHN WALTER** (1864- ). A British geologist and explorer, professor of geology at the University of Glasgow since 1904. Educated at the Stepney Grammar School, Bow, he became assistant in the geological department of the British Museum (1887-1900) and made geological explorations of the western United States, British East Africa, and Spitzbergen (with Sir Martin Conway's expedition, 1896). He was professor of mineralogy and geology at the University of Melbourne (1900-04); director of the Geological Survey of the Mines Department, Victoria (1902-04); and headed expeditions to Lake Eyre (1901-02), Cyrenaica (1908), Southern Angola (1912), and Chinese Tibet (1922). Made a fellow of the Royal Society in 1901, he received the Victoria Medal of the Royal Geographical Society (1919), the gold medal of the Scottish Geographical Society (1922), the Gallois Medal of the Société Géographique de Paris (1922), the gold medal of the Royal Society, Edinburgh (1924), and was elected president of the Geological Society in 1928. His works include, in addition to over 200 scientific papers on geology, *The Foundation of British East Africa* (1901); *The Dead Heart of Australia* (1906); *The Rift Valleys and Geology of East Africa* (1921); *The Menace of Color* (1925); *Human Migration and the Future* (1928), and *Elements of Geology* (1928).

**GREGORY, WILLIAM K(ING)** (1876- ). An American paleontologist and morphologist (see Vol. X). After 1921 Dr. Gregory was curator of the department of comparative anatomy at the American Museum of Natural History and professor of vertebrate paleontology at Columbia University. He was elected to the National Academy of Sciences in 1929. His published works include *On the Structure and Relations of Northarctus, an American Eocene Primate* (1919); *The Origin and Evolution of the Human Dentition* (1922); and *Our Face from Fish to Man* (1929).

**GREIFFENHAGEN, MAURICE** (1862- ). An English painter and illustrator, who studied at the Royal Academy. In 1906 he was appointed head of the Life Department of the Glasgow School of Arts. Elected an associate of the Royal Academy in 1916, he became a fellow in 1922. He won the gold medal at Munich in 1897 and at Dresden in 1901. The University of Glasgow conferred on him the honorary LL.D. degree in 1926. Among his pictures appearing in permanent collections are *The Idyll*, in the Walker Art Gallery, Liverpool; *The Judgment of Paris*, in the Sydney National Gallery; *Portrait of Mrs. M. G.*, in the Carnegie Gallery, Pittsburgh; *The sons of God saw the daughters of men that they were fair*, acquired by the Municipal Museum of Ghent in 1909; and the Royal Academy purchased, with the Chantry

bequest, *Women by a Lake* in 1914, and *Dawn* in 1926. He also designed the historical panels for the Paris and Duncedin exhibitions of 1925.

**GRENADE.** See TRENCH WARFARE, AND STRATEGY AND TACTICS.

**GRENFELL, SIR WILFRED THOMASON (1865- )**. An English medical missionary (see VOL. X), superintendent of the International Grenfell Association, which works for the betterment of conditions among the natives of Labrador. He received the gold medal of the National Society of Social Sciences of America in 1920, was knighted in 1927, in 1928 was elected Rector of St. Andrews University, Scotland, and in 1929 received the honorary degree of LL.D. from Princeton University. His later books include *The Prize of Life* (1914); *Tales of the Labrador* (1916); *Labrador Days* (1919); *A Labrador Doctor, an autobiography* (1923); *Yourselves and your Body* (1925), and *Labrador Looks at the Orient* (1928). Consult *Wilfred Grenfell, the Master-Mariner; a Life of Adventure on Sea and Ice*, by Basil Mathews (1924), and *Grenfell: Knight Errant of the North*, by Fullerton Waldo (1924).

**GRETCHANINOV, ALEXANDER TICHONOVITCH (1864- )**. A Russian composer, born at Moscow. He studied at the Moscow Conservatory with Safonov (1881-91) and at the Petrograd Conservatory with Rimsky-Korsakov (1891-93). He never occupied any official position but devoted his entire time to composition and appeared occasionally as conductor of his own works. In 1929 he made a tour of the United States. His instrumental works show the influence of the German romanticists, but his sacred compositions rank among the finest in all Russian music. Besides two complete liturgies, a *Laudate Deum* for chorus and orchestra, and many sacred choruses a cappella, the list of his works includes two operas, both produced at Moscow, *Dobrynya Nikitich* (1903) and *Saur Béatrice* (1912); four symphonies, chamber music, and incidental music to Ostrovsky's *Snow Maiden* and A. Tolstoy's *Czar Feodor* and *Ivan the Terrible*. In 1917 he wrote *Gimn Svorodni Rossi* (Hymn of Free Russia), which was adopted as the national hymn, replacing the well-known anthem of Imperial Russia.

**GREW, JOSEPH CLARK (1880- )**. An American diplomat, born at Boston and educated at the Groton School and Harvard University. In 1904-10 he was successively clerk and deputy consul general at Cairo (Egypt), third secretary of legation at Mexico City and St. Petersburg, Russia, and secretary or counselor at Berlin and Vienna. In 1917, when the United States broke off diplomatic relations with Austria-Hungary, he was counselor of embassy and chargé d'affaires at Vienna. He was then attached to the Department of State in Washington and served on various commissions there and in Europe. In 1918 he was named secretary general of the American commission to negotiate peace, with the rank of minister, and in 1919 was American secretary of the International Secretariat of the Peace Conference. In 1920 he became Minister to Denmark and, in the year following, he went to Switzerland in the same capacity. In 1922-23 he was American representative in the Conference on Near Eastern Affairs at Lausanne. He negotiated and signed the American-Turkish Treaty of 1923. He served as Under Secretary of State, 1924-27. In May, 1927, he was appointed Ambassador to Turkey.

He published *Sport and Travel in the Far East* (1910).

**GREY, EDWARD, FIRST VISCOUNT OF FALLODON (1862- )**. A British statesman (see VOL. X), Secretary of State for Foreign Affairs from 1905 to 1916. In the latter year, failing eyesight and the succession of Lloyd George as premier caused his resignation after 11 years in office. He was created a viscount the same year. During this time, most Englishmen of both parties had confidence in him, and he exercised wide influence upon European events. By 1919 he was well enough to act as temporary Ambassador to the United States in connection with the peace settlement. He was prominent among the founders of the Royal Institute of International Affairs (1920), and was, with Viscount Cecil, joint president of the League of Nations Union. Although no longer very active, he remained interested in the welfare of the Liberal Party. He opposed Lloyd George's leadership of it, and resigned from it when the latter's funds were accepted by the party (Jan. 20, 1927). However, on July 5, 1927, he stood back of Lloyd George in order to oppose the Conservative government's House of Lords Reform Bill, which threatened the power of the House of Commons. The bill was rejected. Viscount Grey wrote *Twenty Five Years, 1892-1916* (1925), an account of his years in the public service, *Falloodon Papers* (essays, 1920), and *The Charm of Birds* (1927), with woodcuts by Robert Gibbings. See WORLD WAR, under *Outbreak of the War*.

**GREY, ZANE (1875- )**. An American author, born at Zanesville, Ohio. He studied dentistry at the University of Pennsylvania and practiced in New York until 1904, when he turned to writing. His stories, laid in the West, include: *The Mysterious Rider* (1921); *To the Last Man* (1922); and many others, all based on themes of heroic incident and adventure. Among his more recent works are *Tales of Fishing Virgin Seas* (1925); *Tales of the Angler's Eldorado, New Zealand* (1926); *Tales of Swordfish and Tuna* (1927); *Nevada* (1928); *Wild Horse Mesa* (1928); and *Tales of Fresh-Water Fishing* (1928).

**GRIERSON, grē'r'son, SIR GEORGE ABRAHAM (1851- )**. An English Sanskrit scholar (see VOL. X). In 1923 the Campbell Memorial Medal of the Royal Asiatic Society, Bombay, and in 1928 the Order of Merit were added to his long list of honors. He translated or edited: *Lallū-Vākyāni, or The Wise Saying of Lal Dēd, a Mystic Poetess of Ancient Kashmir* (1920); *A Grammar of the Chhattisgarhi Dialect of East Hindi* (1921); *Gipsy Languages* (1922); *The Lay of Alha: a Saga of Rajput Chivalry* (1923); and *Ilalim's Tales; Kashmiri Stories and Songs recorded by Sir Aurel Stein* (1923). In 1926 *Bihār Peasant Life*, prepared in 1885 under orders from the Government of Bengal, was published, and in 1928 the *Linguistic Survey of India* (20 vols.), which required 25 years to compile and a knowledge of 179 languages and 534 dialects.

**GRIFFES, CHARLES TOMLINSON (1884-1920)**. An American composer, born at Elmira, N. Y. He received his entire musical education in Berlin, studying with Jedliczka and Galston (piano), Klatte and Loewengard (theory), and Rüfer and Humperdinck (composition). From 1907 till his death, which occurred in New York, Apr. 8, 1920, he taught at the Hackley School in Tarrytown. As a composer, he belongs to the extreme futurists. His most ambitious work is

a symphonic poem, *The Pleasure-Dome of Kubla Khan*. His other works are a dance-drama, *The Kairn of Koridawn*; a Japanese pantomime-play, *Shojo*; two pieces for string quartet; songs, and piano pieces. Two of the last, *The White Peacock* and *Clouds*, were also orchestrated.

**GRIFFIN, FRANK LOXLEY** (1881- ). An American college professor, born in Topeka, Kan., and educated at the University of Chicago. After serving on the staff of the Yerkes Observatory, he was appointed instructor of mathematics at Williams College in 1906 and was assistant professor in 1909. After 1911 he was professor of mathematics at Reed College in Portland, Oreg. He wrote *Introduction to Mathematical Analysis* (1921), and *Mathematical Analysis—Higher Course* (1926), *Periodic Orbits*, with F. R. Moulton (1920). He also contributed many articles on mathematics and astronomy to scientific papers.

**GRIFFIS, WILLIAM ELLIOT** (1843-1928). An American clergyman, educator, author, and pioneer in intercourse between the United States and Japan. In 1926-27 he made a visit to Japan, where he was received by the Emperor and was decorated with the third-class Order of the Rising Sun. He also visited Korea and Manchuria (see Vol. X). Among his later works are *The House We Live In—Architect and Tenant* (1914); *The Mikado—Institution and Person* (1915); *Millard Filmore—Constructive Statesman* (1915); *Bonnie Scotland and What We Owe Her* (1916); *Dutch Fairy Tales* (1918); *Belgian Fairy Tales* (1919); *Young People's History of the Pilgrims* (1920); *Swiss Fairy Tales* (1920); *Was Brant at Wyoming?* (1921); *Welsh Fairy Tales* (1921); *The Story of the Walloons* (1924); and *An American in the New Italy* (1925). He edited Sawyer's *History of the Pilgrims and Puritans* (1922) and Scheffer's *History of the Free Churchmen in Holland* (1922).

**GRIFFITH, ARTHUR** (1872-1922). An Irish public official, born in Dublin, the son of a compositor. He studied on the continent of Europe, and afterward traveled widely. In 1899 he returned to Ireland, where he established *The United Irishman*. In 1905 he founded the Sinn Fein movement, and published a weekly, *Sinn Fein*. In 1914 the Irish Volunteers, a more moderate movement, obtained his adherence and he published its official organ, *The Nationalist*. Griffith was arrested following the Easter rebellion of 1916, and when he was freed he found himself at the head of the greatest political party in the country. However, on the release of de Valera (q.v.) the latter's supporters gained the upper hand and de Valera became president of Sinn Fein (1917). Griffith was elected a member of Parliament in 1918, and was an outstanding figure in negotiations with the British government for securing Irish independence. His conciliatory proposals did much to bring about the final settlement. With the establishment of an Irish Parliament, he was elected president in January, 1922. In August of that year he died of heart disease.

**GRIFFITH, DAVID (LEWELYN) WARE** (1880- ). An American motion-picture director, born at La Grange, Ky. He was formerly an actor and for a time was a member of James K. Hackett's company. He became connected with motion pictures first as an actor and then as director for the Biograph Film Company. His best productions include *The Birth of a Nation*; *Hearts of the World*; *Broken*

*Blossoms*; *Intolerance*; *Way Down East*; *Orphans of the Storm*; *America*; *That Royle Girl* (1926); *Sorrowful Satan* (1927).

**GRIFFITH-BOSCAWEN, THE RT. HON. SIR ARTHUR SACKVILLE TREVOR** (1865- ). A British public official who was born near Wrexham, England, and educated at Rugby and Queen's College, Cambridge. He was private secretary to the Chancellor of the Exchequer (1895-1900), a Unionist member of Parliament (1892-1906), Parliamentary Charity Commissioner (1900-06), and served in the army in Malta (1899-1900). He reentered Parliament as a Coalition Unionist in 1910 (remaining until 1922), was a member of the London County Council (1910-13), and was knighted in 1911. He was parliamentary secretary to the Ministry of Pensions (1916-19) and to the Board of Agriculture and Fisheries (1919-21); Minister of Agriculture and Fisheries (1921-22) and Minister of Health (1922-23). In 1920 he was made a Privy Councillor. He wrote *Fourteen Years in Parliament* (1907) and *Memories* (1925).

**GRIGGS, FREDERICK LANDSEER MAUR** (1876- ). An English etcher, born at Hitchin, Herts. He studied privately, and later joined the faculty of engraving at the British School at Rome. In 1922 he was elected an associate of the Royal Academy. Examples of his work hang in the British Museum, the Museum of Fine Arts, Boston, and in the National Gallery of Canada, in Ottawa. He illustrated, among other books, *Collected Works of William Morris*; *Life of G. F. Watts*; *Memorials of Edward Burne-Jones*; *Old Colleges of Oxford* (Aymer Vallance); *History of Eton College* (Maxwell-Lyte); and *Highways and Byways in the Cotswolds*.

**GRINNELL, JOSEPH** (1877- ). An American zoologist, born at Old Fort Sill, Okla., and educated at Stanford University. At 20 years of age, he became instructor at Throop Polytechnic Institute, Pasadena, Calif. He taught ornithology, biology, zoölogy, etc., for 22 years in various California institutions and in 1920 became professor of zoölogy in the University of California. Since 1908 he has been director of the California Museum of Vertebrate zoölogy at the University of California. He was editor of *The Condor* and wrote on the birds and mammals of California and Alaska.

**GRINNELL COLLEGE.** A coeducational nonsectarian institution at Grinnell, Iowa, founded in 1847. The student enrollment increased from 512 in the college and 192 in the school of music in 1914 to a total enrollment of 755 in 1927-28, and the number of teachers in the faculty from 50 to 81. An extensive building campaign was inaugurated in 1914, which resulted in the addition of the Alumni Recitation Hall, six residence halls for men, and five cottages and a central hall forming a women's quadrangle, within the next ten years; and in 1926 a swimming pool and building were constructed. The elective system was greatly extended during the period and many new courses were added to the curriculum, especially in the departments of political science, history, economics, and business administration. The library increased from 50,000 to 78,000 volumes, and the endowment from about \$1,500,000 to \$3,995,298 (total resources). The income for 1927-28, exclusive of dormitories, was \$334,459. President, J. H. T. Main, Ph.D., LL.D., D. Hum.

**GRIPPE.** See INFLUENZA.



**GRISCOM, LLOYD CARPENTER** (1872- ). An American diplomat (see Vol. X). In 1917 he was appointed a major in the department of the adjutant general of the United States Army and afterward became a lieutenant colonel on the staff of General Pershing in France.

**GRISWOLD, SHELDON MUNSON** (1861- ). A Protestant Episcopal bishop, born at Delhi, N. Y., and educated at Union College and the General Theological Seminary. From 1885 to 1902, he held pastorates at Ilion, Little Falls, and Hudson, N. Y. In 1902 he was elected and in the following year consecrated missionary Bishop of Salina. In 1917 he was made suffragan Bishop of Chicago.

**GROLL, ALBERT LOREY** (1866- ). An American painter (see Vol. X). His preoccupation with desert scenes with conspicuous cloud effects continued until 1921, when he reverted to his earlier interest in foregrounds. In some later pictures, among them "A Breezy Day—California," and "Wind Storm in Nevada," his clouds no longer dominate.

**GROSSMITH, GEORGE** (1874- ). An English comedian and author, son of George Grossmith and nephew of Weedon Grossmith. He first appeared in an operetta by his father at the Shaftesbury Theatre (1892), becoming a popular figure in musical comedy in London and later in New York, where he first appeared in *The Girl on the Film* (1913). In 1914 he and Edward Laurillard produced *Potash and Perlmutter* in England. He appeared in *Kissing Time* (1919), *Sally* (1921), and *The Royal Visitor* (1924). He was the author or joint author of many musical plays, songs, and revues.

**GROSSMITH, WEEDON** (1853-1919). An English comedian, born in London. He was educated to be a painter but in 1885 he turned to the theatre and joined Rosina Vokes's company, touring in the provinces and the United States. His first appearance in London was as Woodcock in *Woodcock's Little Game* (1887), and he gained his first notable success in *A Pantomime Rehearsal*. In 1894 he successfully produced his own play, *The Night of the Party*. Among his best parts are the rôles of Archibald Bennick in *The New Boy*, Jimmy Jinks in *Baby Mine*, the Earl of Tweenways in *The Amazons*, and the Judge in *Stopping the Breach* (1917), the last rôle in which he played. He wrote an autobiography, *From Studio to Stage* (1913).

**GROSVENOR, GILBERT HOVEY** (1875- ). An American geographer (see Vol. X). Since 1920 he has been president of the National Geographic Society. In 1919 he discovered a lake in Alaska 28 miles long, which was named Grosvenor Lake in his honor. He wrote: *Flags of the World* (1917), *Hawaiian Islands* (1924), *Discovery and Exploration* (1924), and *A Maryland Pilgrimage* (1927), in addition to articles for the magazines.

**GROTJE, grô'tē, A. L. HUGO** (1809- ). A German writer on travel and on political and economic problems born at Magdeburg. He studied at the universities of Leipzig, Vienna, Munich, Würzburg, Rostock, and Berlin. He wrote *Tripolitaniën und der Karawunenhandel nach dem Sudan* (1898), *Tripolitaniische Landschaftsbilder und Volkertypen* (1899), *Die Bagdadbahn und das Schwäbische Bauernelement in Transkaukasien und Palästina* (1902), *Auf Türkischer Erde, Reisebilder und Studien* (1903), *Landeskunde von Rumänien* (1906);

*Wanderungen in Persien* (1910); *Das Albanien und Montenegro* (1913); *Das Albanische Problem* (1914); *Deutschland, die Türken, und der Islam* (1914); *Die Türken und Ihre Gegner* (1915); *Das Auswanderungsproblem und die Deutsche Volkswolffahrt* (1920); and *Bulgarien, Natur, Staat und Volk* (1920).

**GROUP INSURANCE.** See INSURANCE.

**GROUP MIND.** See SOCIAL PSYCHOLOGY.

**GROVER, FREDERICK WARREN** (1876- ). An American college professor, born in Lynn, Mass., and educated at the Massachusetts Institute of Technology, Wesleyan University, and George Washington University, and in Germany. He served on the faculties of Harvard and Wesleyan Universities and Lafayette College, and from 1902 to 1907 was laboratory assistant and associate physicist for the National Bureau of Standards. From 1911 to 1920, he was professor of physics at Colby College, and from the latter date, assistant and associate professor of electrical engineering at Union College. After 1918 he was also consulting physicist at the Bureau of Standards. He was the author of various scientific articles and bulletins and joint author of *Principles Underlying Radio Communication* (1918).

**GROVLEZ, GABRIEL** (1879- ). A French conductor and composer, born at Lille. He studied at the Paris Conservatoire under Diémer (piano) and Gédalge and Fauré (composition). In 1900-06 he taught piano at the Schola Cantorum and also appeared frequently as a concert pianist. From 1906-09 he was chorus master at the Opéra Comique. He became conductor at the Théâtre des Arts, and in 1914 one of the conductors at the Opéra. In 1921-22 and 1925-26, he filled engagements with the Chicago Opera Company, and in 1925 with the San Carlo Opera in Lisbon. He wrote the operas, *La Princesse au Jardin* (Monte Carlo, 1920) and *Le Marquis de Carabas* (Monte Carlo, 1927); the ballets, *La Fête à Robinson*, *Maimouna*, and *Psyché*; the orchestral pieces, *Madrigal lyrique*, *La Vengeance des Fleurs*, *Le Reposeur des Amants*, *Dans le Jardin*; and many pieces for piano.

**GRUBB, WILLIAM IRWIN** (1862- ). An American jurist. He was born at Cincinnati, Ohio, and graduated from Yale (1883). After studying at the Cincinnati Law School, he was admitted to the bar and removed to Birmingham, Ala., where he practiced his profession until 1909, when President Taft appointed him U. S. District Judge for the Northern District of Alabama. In May, 1929, President Hoover named him as a member of the National Law Enforcement Commission.

**GRUBER, L. FRANKLIN** (?- ). An American clergyman, educator, and author, born near Reading, Pa., and educated at the Keystone State Normal School, Muhlenberg College, the Neff College of Elocution and Oratory, and the Mt. Airy Lutheran Theological Seminary. In 1901-02 he was professor of mathematics and English at Wagner College, Rochester, N. Y. Ordained to the Lutheran ministry in 1901, he became a pastor at Utica (1902) and later at Minneapolis, Minn. He was pastor of the Church of the Reformation at St. Paul, 1914-27. Since 1927 he has been president of the Chicago Lutheran Theological Seminary. His works include: *The Version of 1611* (1903); *The Truth About Tyndale's New Testament* (1917); *Documentary Sketch of the Reforma-*

tion (1917); *The Wittenberg Originals of the Luther Bible* (1918); *Creation ex Nihilo* (1918; republished in 1921 under the title *Whence Came the Universe?*); *The Theory of a Finite and Developing Deity Examined* (1918); *Is the Doctrine of an Infinite and Unchangeable Deity Tenable?* (1921); *The Freedom of the Will* (1923); *The Einstein Theory* (1923); and *What After Death?* (1925).

**GUADELOUPE**, ga'da-lōp'. A colony of France, comprising two islands, Guadeloupe proper, or Basse-Terre and Grande-Terre, and five island dependencies, in the Lesser Antilles in the West Indies. Area, 688 square miles; population (1926), 243,243, of whom 90 per cent were Creoles. The largest towns were Pointe-à-Pitre, 26,455 inhabitants; Basse-Terre, 8379; Le Moule, 10,000. Leading products, as reflected in the exports for 1926, were sugar, rum, coffee, and cacao. Exports for 1913 and 1926 were 18,287,480 and 167,663,138 francs, respectively. Imports for the same years were 20,174,930 and 144,849,409 francs. The increased prosperity of the islands was occasioned by the heavy demands made on them for sugar and rum by France. The budget for 1927 had increased to 29,018,596 francs, from the 1911 budget of 4,560,000 francs. A tropical hurricane which swept over the West Indies on Sept. 12, 1928, was the worst in the history of the islands. Guadeloupe's economic future received a serious setback and total damages were estimated between 300,000,000 and 500,000,000 francs.

**GUAM**. An island of the Marianas or Ladrone group, in the Pacific, belonging to the United States; area, approximately 226 square miles. The population of Guam increased from 12,652 in 1913 to 13,275 in 1920. Since the American occupation in 1901, the population has increased about 3600. Between 1918 and 1919, population decreased because of a disastrous typhoon on July 6, 1918, and an epidemic of influenza which swept over the island in October and November of that year. From Nov. 1 to Dec. 31, 1918, there were 858 deaths. Of the population, 92 per cent are called Chamorroes, a hybrid race with a Malayan strain predominating. The remainder of the population include Filipinos, Japanese, Chinese, blacks, and whites. Agaña is the seat of government.

**Agriculture**. Corn is by far the most important agricultural product, representing 60.3 per cent of the total. While there has been an increase in agricultural production since the period of American possession, Guam is not self-supporting. There is more arable land than the present population can cultivate with the means at hand. Other agricultural products are sweet potatoes, yams, tobacco, coffee, rice, cocoa, and sugar. The live stock includes carabao, horses, goats, hogs, and cattle. The carabao in 1916 numbered 6149 and the horses 4367. The carabao is the chief burden-bearing animal and is used both for drawing carts and for plowing.

**Commerce**. The chief commercial product of Guam is copra, obtained from coconuts. The exports of copra to the United States increased from 259,360 pounds in 1915 to 1,140,924 in 1919. Considerable quantities also were sent to Japan. The imports of Guam in the year 1927 were \$418,435; exports, \$224,987.

**Education**. Under the early Spanish governors, public education was discouraged; the rulers believed that the natives would be more

tractable if they remained illiterate. In later years, free schools were established, and by the time the United States assumed control of the island, a majority of the natives could read and write in Spanish. The efforts of the Americans to teach the Chamorro children to use the English language did not prove very successful. The percentage of illiteracy in 1920 was 21.8 and was especially large among the adults. The total number of persons able to speak English in 1920 numbered 4384. Gradual progress was made in the development of an educational system. By the end of that period in 1923, 14 primary schools, one intermediate school, and one high school were operated by the Department of Education. There were also several private schools. The total expenditure for public schools in 1925-26 was: current, \$48,923; outlays, \$5140. The enrollment in the schools in 1925-26 was 2913 and the average daily attendance 2861. A compulsory education law compelled the attendance of all children between the ages of 7 and 12.

**Finance**. The receipts amount to about \$100,000, approximately balancing expenditures. United States appropriations of \$18,000 for the sick and \$12,000 toward education were used in 1928.

**GUATEMALA**, gwa'tā-mälā. The largest of the five Central American republics, with an estimated area of 48,290 square miles, and a population, according to the 1920 census, of 2,004,900. The population in 1912 was 2,119,000; estimated in 1927, 2,454,000. Guatemala, the capital, had 115,928 inhabitants in 1927. Earthquakes from Dec. 25, 1917, to Jan. 24, 1918, completely destroyed the city; but by 1925 the work of restoration had been completed. Other towns are Quezaltenango (30,125), Coban (26,774), and Totonicapan (30,888). Education was on the increase in 1927, with 3297 elementary schools, as compared with 1837 schools in 1912. The total number of pupils was 113,308, of whom 3278 were taking professional, normal, secondary, and special courses. In 1918 the University of Guatemala was opened, and by 1928, 645 students were enrolled.

**Industry**. Coffee planting is the most important single activity, and coffee exports included more than three-fourths of the exports. In 1927, 112,700,000 pounds of coffee were exported as compared with 76,219,800 in 1912. Production in 1927-28 was estimated at 82,000,000 pounds. Bananas and sugar come next in importance as export crops. Food crops are being cultivated more extensively; especially corn, rice, and wheat. Forest products are beginning to play larger rôles in the country's trade, for by 1927 chicle to the value of \$184,000 was exported (\$142,108 in 1913), and timber to the value of \$684,000 (\$247,757 in 1913). Mineral production is still backward because of lack of transportation and capital. Chrome was discovered in 1916, and oil seepages were reported in 1922, but in 1928 only mica and gold were being produced in commercial quantities. In December, 1915, the state took over all the ore lands in the country, to be exploited under leasehold only. Imports and exports for selected years follow:

	Imports	Exports
1914 .....	\$ 9,331,115	\$12,754,027
1920 .....	18,344,463	18,102,906
1923 .....	13,763,499	14,725,531
1927 .....	22,685,000	38,951,000
1928 .....	24,146,181	28,211,572

Proportions by countries of origin of imports were, for 1928, the United States, 55 per cent (50 in 1913); United Kingdom, 10.9 per cent (16 in 1913); Germany, 13.8 per cent (20 in 1913). Leading articles of importation are cotton goods, wheat flour, iron and steel manufactures, machinery, foodstuffs, drugs, and medicines. Proportions by countries of destination of exports were the United States, 55.3 per cent (27 in 1913); Germany, 33.2 per cent (53 in 1913). Coffee went to the United States to the amount of 55.4 per cent, and 37.4 per cent to Germany. Practically all bananas were shipped to the United States. The importance of the United States in the carrying trade increased enormously. In 1913, 803 ships entered Guatemalan ports; in 1926, 1714 entered.

**Communications.** In 1914 the International Railways of Central America, purchased by American capitalists in May, 1924, acquired a 60-mile railroad from Santa Maria to Las Cruces and built an extension of 45 miles from Las Cruces to Ayutla on the Mexican border. This was part of a larger scheme to build a through route between Vera Cruz and Panama, extending along the entire western length of Central America. In July 1929 the connecting link between Zacapa, in Guatemala, and San Salvador, Santa Ana, and Ahuachapan, in Salvador was completed uniting these two countries. In 1916 a concession was granted for the construction of an intracoastal canal skirting the Pacific coast for 80 miles from San José to the Esclaves River. The total railway mileage was 638 miles in 1927. In 1926, there were 4774 miles of telegraph line and 2913 miles of telephone.

**Finance.** For 1926-27 national revenues totaled \$12,411,000 and expenditures \$12,259,000. The budget for 1928-29 balanced at \$12,500,000. This was an increase of \$1,500,000 over 1927-28. On Dec. 31, 1927, the public debt was approximately \$21,865,000, of which \$14,818,000 was foreign debt, floated partly in England and partly in the United States. In 1918 a National Bank was established, one of its chief purposes being the making of agricultural loans. On June 30, 1926, there were in circulation 6,976,000 quetzales, a new unit of currency established on Nov. 26, 1924, with a par value of \$1. Since that date, there has been little fluctuation in exchange.

**History.** At the expiration of his term in 1916, Estrada Cabrera was once more reelected President. On Apr. 27, 1917, Guatemala broke off diplomatic relations with Germany and offered her transportation facilities to the United States in the prosecution of the War. On Oct. 3, 1919, peace was made with Germany. President Cabrera's virtual dictatorship since 1898 was successfully broken in 1920, when the more progressive elements of the country organized to effect a liberal administration. Cabrera was the first to resort to force, but his army deserted him and he was compelled to resign. Dr. Carlos Herrera was appointed provisional President and on Sept. 15, 1920, took the oath for the unexpired term, 1916-23. He was immediately recognized by the United States. He applied himself to repairing the damages of the earthquake and was also instrumental in having Guatemala form the Central American Union (q.v.) together with Honduras and Salvador in 1921. On Dec. 6, 1921, however, he too was overthrown by a military clique incensed at the country's participation in the Union, and

a provisional government was formed by General Orellana, chief of staff. Orellana was elected President in March, 1922; by July he was confronted by a rebellion which proved unsuccessful. The leaders were put to death, and two Catholic priests were expelled. It appeared for a time that the new government had no desire to aid in the formation of a federal Central American state, and in October, 1922, Orellana refused to adhere to the pact signed on the U.S.S. *Tacoma* on Aug. 20, 1922, by Nicaragua, Honduras, and Salvador, though his government participated in the Central American Conference of 1923 at Washington and signed the conventions concluded. In June, 1924, however, Guatemala once again took a forward step in the furthering of amicable Central American relations when her Assembly was the first to ratify the important General Treaty of Peace and Amity and the Convention for the Establishment of International Commissions of Inquiry, both adopted by the Central American Conference in Washington in 1922.

In May, 1927, Guatemala, Honduras, and Salvador signed a convention agreeing not to take separate action in examining or settling questions affecting the general interests of Central America before their foreign ministers had consulted with each other. Included among the questions to which the convention would apply were the making of an agreement by one of the three countries with any nation outside of Central America which might affect Central American nationality, declarations of war, recognition of new governments in accordance with existing treaties, and certain questions arising out of existing international treaties. President Orellana died Sept. 26, 1926, and in December Lazaro Chacon was elected to succeed him. One of the election promises made by Chacon was that he would take action to amend the constitution to prevent a president from succeeding himself. He made his word good by calling a constitutional assembly, which held sessions throughout the last half of 1927. Once started, the assembly did not confine itself to the object for which it was called, but proceeded to revise the constitution drastically for the purpose of lessening the president's power and preventing a dictatorship.

Among the provisions adopted was one prohibiting the president from holding the office again for 12 years after his six-year term expired; another providing that the president and cabinet could not legislate during the recess of the assembly; and others empowering the Supreme Court to declare laws unconstitutional and disfranchising military officers and men on active duty. These changes became effective early in 1928. Revolutionary agitation brought a suspension of constitutional guarantees by President Chacon in September, 1928. In January, 1929, a revolutionary movement in the northwest was suppressed by the army. In 1928 a century-old boundary dispute with Honduras was revived when the two countries granted concessions to different fruit companies for operating in the disputed district of Izabel. At the request of both governments, the United States agreed to act as mediator, and Roy T. Davis was appointed chairman of a mixed boundary commission. The commission made extended investigations but came to no conclusion, and in June Secretary Kellogg suggested that the dispute be left to the International Central American Tribunal. Guatemala accepted the suggestion but Honduras re-

fused. In March, 1929, diplomatic relations with Nicaragua, which had been severed during the Sacasa revolution, were resumed.

**GUCHKOV, ALEXANDER** (1862- ). A Russian politician, born at Moscow, and educated at the University there and under Professor Schmoller of Berlin. He led an adventurous youth as a volunteer in the Boer War (1899-1902) and with the Red Cross in the Russo-Japanese War. The leader of the Octobrists, in the third Duma (1907-12), he was speaker in 1910-12, and attacked the Court and the Ministry of War for inadequate military preparations against Germany. On the outbreak of the March Revolution in 1917, he went to Pskov to force and receive the Czar's abdication, and was made Minister of War, but resigned in the face of the desertions and demoralization in the army. He eventually took refuge in Paris and was a member of the group working against the Communist regime in Russia.

**GUEDALLA, gwá-dál'la PHILIP** (1889- ). An English author, educated at Rugby and Oxford, who became a barrister of the Inner Temple in 1913, and practiced for 10 years. He was legal adviser to the Contracts Department, the War Office, and the Ministry of Munitions, and organized and was secretary to the Flax Control Board (1917-20). He contributed frequently to the *London Times*, *New Statesman*, *Daily News*, and the *American Vanity Fair*. *Ignes Fatui, a Book of Parodies* appeared in 1911, but it was not until the publication of *The Second Empire* (1922) that he was accorded general recognition. In this work, with great skill and not a little malice, he succeeded to a large extent in scaling down the heroic proportions of Napoleon the Little. His other works include *Masters and Men* (1923); *A Gallery* (1924); *A Council of Industry* (1925); *Napoleon and Palestine* (Davis Lecture, 1925); *Independence Day* (1926); *Fathers of the Revolution* (1926); *Conquistador: American Fantasia* (1927); *Bonnet and Shawl* (1928), and *Gladstone and Palmerston* (1928). From 1925 to 1928, he edited *Curiosities in Politics; a series of monographs on remarkable personalities of the 18th and 19th centuries*.

**GUÉRARD, gá'rár', ALBERT LÉON** (1880- ). A French philologist, born in Paris and educated there and in London. After an interval of travel, he became professor of literature and examiner in history at the École Normale. In 1906 he went to the United States as instructor in French at Williams College, was assistant professor of French at Stanford University (1907-13), professor of French at the Rice Institute in Houston, Tex. (1913-24), and at the southern branch of the University of California (1924-25). In the latter year, he returned to Stanford University as professor of general literature. His principal works are *French Prophets of Yesterday* (1913); *French Civilization in the Nineteenth Century* (1914); *Five Masters of French Romance* (1916); *L'Avenir de Paris* (1919); *French Civilization from Its Origins to the Close of the Middle Ages* (1920); *International Languages* (1921); *The Napoleonic Legend* (1923); *Honoré de Balzac* (1924); *Beyond Hatred* (1925), and *The Life and Death of an Ideal* (1926).

**GUERIN, JULES** (1866- ). An American painter and illustrator (see Vol. X). He was director of color and decoration at the Panama-Pacific International Exposition, 1915.

Noteworthy among his later works were the decorations of the Pennsylvania Station, New York City, and those of the Lincoln Memorial Building, Washington.

**GUERRERO, gá-rá'rô, MARÍA** (1868-1928). A noted Spanish actress. Born in Madrid, she early showed an inclination for the stage, which her father abetted. In 1885, she made her début in *Sin familia*, and was immediately acclaimed by the public. Later, she went to Paris, studied under Coquelin, and performed with him and with Sarah Bernhardt. After her return to Spain, she served in various companies, and in 1896 married Fernando Díaz de Mendoza (Marqués de Fontana, Conde de Balazote and Conde de Lalaing), with whom she had acted on several occasions. In 1897 they went to Argentina for the first time, returning thither yearly thereafter. In 1898 they toured France and Italy. Her most notable interpretations were in *Mancha que limpia* and *El loco Dios*, by Echegaray; *Don Juan Tenorio*, by Zorilla; *La Dolores*, by Feliu y Codina; *La Leona de Castilla*, by Villaspesa; *Mariucha*, by Pérez Galdós; *La Estrella de Sevilla*, by Lope de Vega; *El vergonzoso en palacio*, by Tirso de Molina; *Amores y Amoríos*, by the Álvarez Quintero brothers; *La malquerida*, by Benavente; and *El Doncel romántico*, by Fernández de Ardevín.

**GUEST, EDGAR ALBERT** (1881- ). An American press humorist and poet, born at Birmingham, England, and educated in the public schools of Detroit. In 1895 he became connected with the *Detroit Free Press* and has since established a reputation as a writer of humorous verse and sketches. He is author of *A Heap o' Livin'* (1916), *Just Folks* (1917), *Over Here* (1918), *Path to Home* (1919), *When Day is Done* (1921), *Poems of Daily Life* (1922), *All That Matters* (1923), *The Passing Throng* (1923), *Rhymes of Childhood* (1924), *The Light of Faith* (1926), *You Can't Live Your Own Life* (1928), and *Harbor Lights of Home* (1928).

**GUIANA, BRITISH.** A British colony on the northeastern coast of South America, forming the western part of Guiana. Area, 80,480 square miles; population in 1911, 296,000; in 1927, 308,478. Georgetown, the capital, had 57,416 inhabitants in 1927. On Dec. 31, 1927, there were 127,017 East Indians in the colony, of whom 58,822 were residents on estates, and 70,142 resided elsewhere. The leading products are sugar cane, diamonds, balata, bauxite, rice, cocoanuts, coffee, cacao, wood, and timber. The steady decline of gold continues; the 1927 output was 6722 ounces as compared with 79,194 ounces in 1913. The diamond output showed increases with the discovery of new fields in 1922, the 1927 production being 173,797 carats, valued at £724,152. Imports for 1927 were valued at £2,657,265; exports, £3,525,274. The eight principal imports in 1927 were flour, textiles, manure, pickled pork and beef, boots and shoes, butter, cement, and tobacco. These came largely from Great Britain, the United States, and Canada. Total tonnage entered and cleared in 1911-12, 1920, and 1927, was 988,663; 899,748, and 1,138,493. Revenues for 1927 were £1,068,865; expenditures for the same year, £1,148,028. The public debt on Jan. 1, 1928, was £2,675,270.

**Dutch Guiana, or Surinam.** Located between British Guiana on the west and French Guiana on the east. Area, 54,291 square miles; population in 1910, 86,233; in 1927, 145,763, ex-

clusive of the Indians and Negroes living in the forests. Paramaribo, the capital, had 35,346 inhabitants in 1910 and 45,791 inhabitants in 1927. The leading products are sugar cane (26,430,000 pounds in 1910; 15,572,500 kilos in 1927); rice (4,386,000 pounds in 1910, 14,899,000 kilos in 1926); cacao (3,702,600 pounds in 1910, 215,700 kilos in 1927); coffee (445,000 pounds in 1910; 3,036,000 kilos in 1927); and bananas (402,200 bunches in 1910; 372,000 in 1927). Gold production in 1910 was 1,081,476 grams, and only 239,796 grams in 1927; balata, 1,495,300 pounds in 1910 and 503,000 kilos in 1927; and rum, 210,780 gallons in 1910 and 666,300 litres in 1926. Exports for 1927 were valued at 11,689,685 guilders; imports, 9,288,858 guilders. Leading imports are provisions, hardware, clothing, and manufactured articles. Tonnage entered in 1910 was 210,998; in 1927, 209,784 register tons; cleared, 208,999 register tons. Revenues, expenditures, and subvention for 1914 were 7,051,800, 6,260,530, and 790,260 guilders. For 1929 they were 5,951,000, 8,414,000, and 2,463,000 guilders (nominal value of the guilder, \$0.402).

**French Guiana.** Forming the eastern part of Guiana. Area, about 34,740 square miles; population in 1911, 49,009; in 1926, 47,341. Creoles make up four-fifths of the inhabitants. In 1926 the penal population totaled 6200 individuals. Cayenne, the leading town, had 13,527 inhabitants in 1911, and 13,936 in 1926. Gold is the product of greatest economic importance. Exports are gold, rosewood essence, hides, and cacao. Rice, manioc, cacao, coffee, bananas, and vegetables are cultivated in small quantities for local consumption. Imports for 1927 were valued at 61,641,424 francs; exports, 29,760,728 francs. About 90 per cent of the exports are taken by France and her colonies. The local budget for 1912 balanced at 3,592,000 francs; for 1927, receipts were estimated at 11,000,000 francs; expenses, 10,500,000 francs. Subventions from the French government are still necessary. The rivers allow of steamboat communication.

**GUILD SOCIALISM.** Guild Socialism was an English intellectual movement that flourished largely during the World War and in the four or five years immediately after its termination. By 1925 it was reduced to a paper movement. It never had many adherents but gained considerable popular attention as a result of the activities of a small group of brilliant journalists among whom the following were the outstanding figures: Orage, Penty, Cole, Hobson, Douglass, Reckitt, Bechhofer, de Maztzu, and Taylor. Bertrand Russell in his *Proposed Roads to Freedom* and Harold J. Laski in his earlier writings made the aims of the guild socialists familiar to American liberals. Guild socialism sought the abolition of the wage system and the establishment by the workers of self-government in industry through the agency of the guild. That is to say, organization in the new state was to be on the basis of function. To include all the functions of an industrial society there were to be industrial, civic, and distributive guilds. Government was to be the affair of a guild, too. As for the matter of authority or sovereignty, there was considerable disagreement among guildsmen, some holding that complete decentralization would take care of all contingencies and others believing that there was need for a centralizing authority.

The movement arose in the first decade of this century, through antagonism to the ruling collectivism in English radical thought, and was definitely formulated in 1906. Its first formal appearance, however, was in 1912. On Christmas, 1914, the Stonington Document, containing a statement of principles, was drawn up. On Easter, 1915, the present organization was completed, and the name of National Guilds' League was adopted. In the early years of the War, guild socialism grew slowly; its growth was more rapid during the last years of the War and after the Armistice. Although British trade unionists were rather unresponsive to guild ideas, the movement had nevertheless a considerable indirect influence on English labor, especially in the restive years after the War, when there was widespread unemployment, discontent, and strikes throughout the country. Guild socialism spread in one form or another, and with its increasing hold on the more revolutionary elements, it became itself more radical. The British Miners' Federation was always somewhat in sympathy with guild ideas, and its proposal for the nationalization of the mines embodied a concept of guild socialism. The Union of Post Office Workers and the National Union of Teachers adopted resolutions to organize on the guild plan. Finally, the guild idea found practical application in the Builders' Guilds, organized in conformity with guild principles. These guilds proved rather successful for a time. The guild plan spread subsequently to house furnishings, tailoring, engineering, and other trades. Partly on account of severe competition and partly on account of poor management, the Building Guild became involved in financial difficulties, and in November, 1922, it went into a receiver's hands and was later dissolved. In May, 1923, the National Guilds' League merged with the National Guilds' Council, and *The Guild Socialist*, the official monthly, ceased publication.

Guild socialism failed to seize the popular imagination because it turned largely on organization detail and could not present a programme for the capture of the industrial state; because it concerned itself with matters that the average workman held of no significance, such as liberty and other purely political concepts; and because its proponents were Oxford dons and journalists and not the stuff of which revolutionary leaders are made.

**GUILLAUME, g'èyòm', CHARLES ÉDOUARD** (1860- ). A Swiss physicist, born in Fleurier and educated at Neuchâtel and Zurich. In 1883 he was appointed assistant at the International Bureau of Weights and Measures, of which he became director in 1915. He carried out many experiments bearing on the work of the Bureau, and in 1920 was awarded the Nobel Prize for physics. His many publications include *Nickel and Its Alloys* (1898); *Applications of Nickel-Steels* (1904); *Initiation to Mechanics* (1909); *Metrological Research on Nickel-Steel* (1927), and *The Work of the International Bureau of Weights and Measures* (1927).

**GUILLERI, COMPÈRE.** See DESCAYES, LUCIEN.

**GUINNESS, THE RT. HON. WALTER EDWARD** (1880- ). A British public official, born in Dublin, the third son of the first Earl of Iveagh. He was educated at Eton, was wounded while serving in South Africa (1900-01), and was a



brigade major in the World War, winning the Distinguished Service Order. He was a Unionist and Conservative member of Parliament after 1907 and held office as Under-Secretary of State for War (1922-23), Financial Secretary to the Treasury (1923-24 and November 1924-25), and Minister of Agriculture and Fisheries (1925-1929). In 1924 he was made Privy Councillor.

**GUISEZ**, gwě'să', JEAN (1872- ). A French surgeon, authority on the ear, nose, and larynx and on the use of the bronchoscope. He has produced a number of authoritative works including *Du Traitement Chirurgicale de l'Éthmoïdite Purulente* (1902); *Tracheobronchoscopie et Œsophagoscopie* (1905); *La Pratique Oto-rhino-laryngoscopique* (3 vols., 1908); *Œsophagoscopie Clinique et Thérapeutique* (1911); *Diagnose, Traitement, et Expertise des Séquelles Oto-rhino-laryngologiques* (1921); and *Diagnose et Traitement des Rétrécissements de l'Œsophage et de la Trachée* (1923).

**GUITERMAN**, ARTHUR (1871- ). An American author and poet, born of American parentage in Vienna and educated at the College of the City of New York. He did editorial work on the *Woman's Home Companion*, *Literary Digest*, and other magazines. He was president of the Poetry Society of America, 1925-27. Among his works are *Betel Nuts* (1907); *The Laughing Muse* (1915); *The Mirthful Lyre* (1918); *Ballads of Old New York* (1920); *Chips of Jade* (1920); *A Ballad Maker's Pack* (1921); *The Light Guitar* (1923); *A Poet's Proverbs* (1924); *I Sing the Pioneer* (1926); *Wildwood Fables* (1927). These were mostly light verse. Mr. Guiterman has contributed to *Life* and other periodicals.

**GUITRY**, gî'tri, SACHA (1885- ). A French actor and writer (see Vol. X), son of Lucien Guitry. He wrote many of his plays for his father, who died in 1925, or for Mlle. Yvonne Printemps, his wife, and often played in them himself. His later plays include *Jean de la Fontaine* (1916); *L'Illusioniste* (1917); *Deburau* (1918); *Pasteur* (1919); *Mon père avait raison* (1919); *Beranger* (1920); *Le grand Duc* (1921); *Un sujet de roman* (1923); *L'amour masqué*, music by André Messager (1923); *On ne joue pas pour s'amuser* (1925); *Mozart* (1926); *Le miracle* (1927), and *Mariette* (1928). His *Deburau* and *The Grand Duke* were successful in New York with Lionel Atwill in the leading parts. Consult *Critical Ventures in Modern French Literature* by Arnold Whitridge (1924).

**GULBRANSSON**, gûl-brân'sûn, OLAF (1873- ). A German illustrator who was born in Oslo, Norway, but lived in Munich after 1902. He contributed illustrations and caricatures to *Simplicissimus*, and was also esteemed as a painter. *Berühmte Zeitgenossen* is a collection of his works.

**GULICK**, SIDNEY LEWIS (1860- ). An American missionary, born at Ebon, Marshall Islands, and educated at Dartmouth College and Union Theological Seminary. He was ordained in the Congregational ministry in 1886 and in the next year went to Japan, where he remained for 27 years doing missionary work. At the same time, he held the chair of theology at Doshisha, Kyoto (1906-13) and lectured at the Imperial University at Kyoto (1907-13). He was secretary of the commission on international justice and good will of the Federal Council of Churches of Christ in America after 1914

and of the National Commission on American-Japanese Relations (1921- ). Among his works are *Evolution* (1910); *The American-Japanese Problem* (1914); *The Fight for Peace* (1915); *America and the Orient* (1916); *American Democracy and Asiatic Citizenship* (1918); *The Korean Situation* (1919, 1920); *Problems of the Pacific and the Far East* (1921); *Should Congress Enact Special Laws Affecting the Japanese?* (1922); *The Christian Crusade for a Warless World* (1922); *The Winning of the Far East* (1923).

**GUNNERY**, NAVAL. The development of naval gunnery during the World War was along lines laid down several years previous. The sole innovation was "spotting" the fall of projectiles by means of aircraft. This was used only on a few occasions and in comparatively minor operations against works on shore. No vessels were fitted to carry, send out, and receive airplanes early enough to take part in purely naval warfare. The German airships did much scouting but little spotting (report of fall of projectiles), and the use of non-rigid dirigibles and kite balloons by any of the naval belligerents was unimportant except in the vicinity of naval bases. The general naval sentiment now is opposed to placing any dependence on the use of lighter-than-air aircraft for spotting work in war time. The reasons are many—paucity of numbers, cost, vulnerability, difficulty of maintenance in readiness for use, etc. For spotting, scouting, and other purposes, the great fleets of the principal naval powers are now accompanied by aircraft. All large fighting ships of the U. S. Navy carry two or more planes; and some destroyers and submarines are equipped with small folding planes. In other navies, the equipment has not yet been carried so far, either in planes or in catapults; but the general movement is toward the American model. All powers are developing airplane spotting but, concerning the degree of success achieved, much secrecy is preserved.

"Director" firing, in which guns are laid in accordance with directions electrically transmitted from a central director station, received ample verification of its importance by the experiences of the War. It was susceptible of great improvement by the better training of the men at the guns and in the director station and by greater accuracy and efficiency of observing instruments and of the means and methods of combining their readings. These instruments, consist of telescope sights on the guns and in the director tower or station, range finders, range clocks or keepers, change-of-range indicators, deflection indicators, course indicators, and mapping or combining apparatus.

The range finder most in use during and after the War is the Barr and Stroud. (See NEW INTERNATIONAL ENCYCLOPEDIA, Vol. XIX, p. 542). The range keeper is a dial or other form of register in the central station by which the range indicators at the guns are controlled. Change-of-range indicators are automatic calculating machines which, given the observed range at two moments, continue to apply the rate of change and indicate the probable range after each small interval of time. When new ranges are supplied to it, the ranges are corrected in accordance with the new rate. The ranges shown on the range keeper and range indicators at the guns are derived from the change-of-range instrument, and it may be directly con-

nected to both; in this case, the corrections to the range due to observed fall of the shot are applied to the ranges as supplied to the change-of-range instrument instead of to the range keeper. Deflection indicators keep track of the observed fall of the projectiles to the right or left of the target and transmit it to suitable dials at the guns, where the gun-sights are set in a new angle with the axis of the bore in order to correct the ascertained error due to various causes such as speeds of ship and target, changes of course, air currents, etc.

Course indicators are used in connection with the plotting or combining apparatus or diagram or for solving the enemy's course and speed. The director tower, or station, is directly connected with the central station or plotting room and with the guns. The observer at the director sight fires the battery in whole or half salvos or singly in accordance with instructions. The fall of the projectiles is noted, and if necessary, corrections are made in range or deflection. The foregoing gives only a general idea of modern methods of the control of gun fire such as were used in the War and since. While the details of operation and of the instruments are being constantly improved and much secrecy maintained as regards these improvements, the work performed is roughly as described. See ARTILLERY and ORDNANCE.

**GUNS, NAVAL.** The calibre and power of the heavy guns of battleships increased steadily from 1910. By the terms of the Limitation of Armaments Treaty, the maximum calibre was fixed at 16 inches, and guns of this calibre will probably be carried by all first-class battleships and battle cruisers built in future. Second-class battle cruisers of high speed, but of 17,500 tons or less, designed to operate against the 10,000-ton light cruisers, are under consideration in France. Such vessels would probably carry guns of less than 16-inch calibres. The length of the guns will be 45 or 50 calibres and the service muzzle velocity about 300 feet per second. Higher velocities could readily be obtained, but they would greatly shorten the effective life of the gun; at 3000 feet, the life is short enough. As "spotting" (of the fall of projectiles) from airplanes or other aircraft will be possible in future naval battles, high-angle and long-range firing is being sought, and the gun mounts of recent battleships are arranged for an elevation of 30 degrees or more. The largest calibre of gun that can be carried by cruisers under the treaty is 8 inches, and all 10,000-ton cruisers of modern design will carry six or eight 8-inch guns on high-angle mountings.

The increasing numbers of 10,000-ton light cruisers has led to improvements in guns of 8-inch calibre—the maximum size permitted in vessels of this class by the rules of the Washington Conference. The changes reported are greater length, power, elevation, range, projectile velocity, and ease of operation. New guns of all calibres show some improvement in efficiency, particularly as regards elevation and control. As far as practicable, these changes are being made in the mounts of guns on existing ships—particularly on battleships and battle cruisers. Since the War, there has been an increasing amount of attention given to the development of anti-aircraft guns. Up to the present there is, in the different navies, a wide divergence in type and calibre of these guns. The new British

battleships, *Rodney* and *Nelson*, carry six 4.7-inch anti-aircraft guns, but the 6-inch guns of the auxiliary battery have exceptional elevation and might be used against aircraft under favorable circumstances. On other British battleships and new large cruisers, 4-inch guns are mounted. French and Italian battleships carry 3-inch anti-aircraft guns and some smaller ones. The new 10,000-ton French cruisers carry eight 3-inch (or 3.5-inch) and some smaller ones. The new 10,000-ton Italian battleships have 16 guns in the auxiliary battery—all on anti-aircraft mounts. On nearly all battleships, and on all the new cruisers and aircraft carriers of the U. S. Navy, 5-inch anti-aircraft guns are mounted—8 of them on the battleships; 4 to 6 on the cruisers; and 12 on the aircraft carriers. Various types of anti-aircraft mounts are under trial and development by the U. S. Army and Navy. One of these is said to give almost complete automatism. By means of a sound locator and range control, it is kept on the target continuously and fired at the correct range.

See ARTILLERY; ORDNANCE; VESSEL, NAVAL; PROJECTILE; NAVIES OF THE WORLD.

**GÜNTHER, gūn'tēr, SIEGMUND (1848-1923).** A German geologist (see VOL. X). He became editor of the *Münchener Geographische Studien* in 1896 and published, in the period 1914-24, *Das Zeitalter der Entdeckungen* (1919), *Geschichte der Naturwissenschaften* (1919), and *Lehren der Revolution* (1920).

**GURLITT, gur'lit, CORNELIUS (1850- ).** A German architect, art critic, and historian, born in Nischwitz. His work on the art monuments of Saxony appeared in installments from 1894 to 1919. He also wrote *Kunst und Künstler am Vorabend der Reformation* (1890); *Beiträge zur Geschichte der Gotik* (1892); *Sir Edward Burne-Jones* (1894); *Die Kunst des Neunzehnten Jahrhunderts* (1900); *Geschichte der Kunst* (1902); numerous monographs on cities, including Berne, Zurich, Lyons, Liège, and Cambridge (1903-08); *Constantinople* (1907); *Das Französische Sittenbild im Achtzehnten Jahrhundert* (1912); *Schutz der Kunstdenkmäler im Kriege* (1915); *Die Klosterbauten in Belgien*, with Professor Clemen (1916); *Handbuch des Städtebaus* (1920); *Pflege der Kirchlichen Kunstdenkmäler* (1921), and *Langbein der Rembrandtdeutsche* (1927).

**GUSEV-ORENBURSKY, S. I. (1867- ).** A Russian writer whose novels are realistic studies of the life of the Russian clergy in the rural districts, and are filled with revolutionary feeling. He wrote *Short Stories* (1899-1916), *The Land of the Fathers over the Meadow* (1909), *Darkness* (1915), *The Lessons of the Burgher War* (1921), and *The Land of the Children* (trans. 1928).

**GUSTAVUS (GUSTAF) V (GUSTAVUS ADOLPHUS) (1858- ).** King of Sweden (see VOL. X). His militaristic policy was considered by many as a strong factor in Sweden's ability to remain neutral during the World War. He especially emphasized the importance of close coöperation between the kingdoms of Sweden, Norway, and Denmark, and he suggested the first meeting of their three monarchs, which took place at Malmö, Sweden, in 1914. Consult *Könung Gustaf V seattio år*, by G. Asbrink (1918).

**GUSTAVUS ADOLPHUS (GUSTAF ADOLF) (1882- ).** Crown Prince of Sweden and Duke of Skåne, born in Stockholm. He attended the University of Upsala and under-

went a strict military and athletic training. He was a clerk in all the important branches of the Government and traveled extensively in Europe, Africa, the Near and Far East, and the United States (May, 1926). A trip to Greece inspired him to be an archaeologist, a subject in which he became an authority. He worked on excavations on his estate at Sofiero, raised the money for and worked for a month and a half at the Swedish dig at Asine, Greece, and became the greatest Swedish authority on Chinese art, especially ceramics, through his work in the Far East. In 1905 he married Margaret, daughter of the Duke of Connaught (1882-1920), and in 1923 Lady Louise Mountbatten. By the first marriage, he had four sons and one daughter.

**GUTHRIE, WILLIAM NORMAN** (1868- ). An American clergyman, born at Dundee, Scotland, educated at the University of the South, and from 1889 to 1910 lecturer and professor of literature at several universities, including the University of Chicago. In 1910 he became rector of the Church of St. Mark's-in-the-Bow-erie, New York City. He attracted attention after 1922 by holding services in his church in which dances were introduced to interpret religion. Bishop William T. Manning, head of the diocese, demanded in January, 1924, that the services be discontinued and when the rector refused, he deprived St. Mark's of episcopal ministrations. Religious dances were still being performed at St. Mark's in 1929. Dr. Guthrie's publications include: *Beyond Disillusion, a Dramatic Study of Modern Marriage* (1915); *Uncle Sam and Old World Conquerors* (1915); *The Gospel of Osiris* (1916); *Leaves of the Greater Bible* (1917); *The Religion of Old Glory* (1919); *From Ragnarok to the Immediate Presence of God* (1922); *The Birth and Progress of the Human Soul* (1923); *Offices of Mystical Religion* (1927).

**GUYER, MICHAEL FREDERIC** (1874- ). An American zoologist, born at Plattsburg, Mo., and educated at the University of Missouri, the University of Chicago, and the University of Nebraska. He was assistant in zoology at the University of Nebraska (1894-97), professor of zoology at the University of Cincinnati (1900-1911), and professor of zoology at the University of Wisconsin (1911- ). Professor Guyer published articles on cytology, genetics, and the transmission of acquired defects through the influence of antibodies, as well as *Animal Micrology* (1906; rev. ed., 1917), and *Being Well Born* (1916; revised, 1927).

**GWATHMEY, JAMES TAYLOR** (1863- ). An American physician and specialist in anaesthesia, born at Norfolk, Va. He received a degree in medicine in 1899 from Vanderbilt University. At the International Medical Congress, London, 1913, he described his method of colonic anaesthesia with ether and oil and in the following year published the first edition of his book *Anaesthesia*, which has subsequently been much amplified. During the World War, he tested a method of anaesthesia for the pain of wounds and in 1923 with Dr. A. B. Davis of the Lying-In Hospital, New York, he published a new method of obstetrical anaesthesia which had been tested in that institution. Dr. Gwathmey is also clinical professor of oral surgery in the college of dentistry, N. Y. University.

**GYMNASTICS.** The United States undoubtedly pays more attention to this sport than

any other country. Colleges, Y. M. C. A.'s and athletic clubs carry through ambitious gymnastic programmes during the winter months. Football, rowing and baseball squads also incorporate certain forms of gymnastics into their training curriculums.

**GYPNUM.** The gypsum industry has taken rank as one of the foremost of the rock-products operations, and by 1929 a realization of the stabilization of the enterprises engaged therein was general. The market for gypsum and gypsum products is closely allied with the activity of the building trade. Competition among the gypsum producers is very keen and considerable research has been done in recent years in the development of new products and in extending the use of gypsum into new fields. Some of the products developed in recent years and their trade names are as follows: "Sabinit," a gypsum product for use in the treatment of walls, ceilings, floors, columns, piping vents, and mechanical equipment; "Structolite," a load-bearing tile; "Setfast," a special cement for laying gypsum tile; "Rocklath," "Locklath," and "Gyplap," new gypsum lath and plasterboard products; "Calacoustic," a new acoustic plaster; and "Thermocrete," an inside-wall insulation product. The development of the gypsum-manufacturing industry has been very great since the World War. The development has been rapid, extensive, and possibly beyond present requirements, but probably not inconsistent with the greatly increased consumption that is bound to come as the public learns more about the characteristics and quality of gypsum and its various uses.

The production of crude gypsum in the United States has increased from about 2,000,000 short tons in 1918 to nearly 6,000,000 tons in 1928. New York is by far the largest producer of crude gypsum in the United States. Other important producing States are Iowa, Michigan, Texas, Ohio, Nevada, Oklahoma, and Kansas.

Imports of crude gypsum in 1928 amounted to 918,588 short tons, valued at \$1,340,953. A large proportion of the United States imports come from Canada with Mexico of secondary importance. The gypsum-producing industry of Canada has expanded very rapidly in the past decade. In 1918 Canadian production was 152,287 short tons of gypsum; in 1927 the output was 1,063,117 tons.

**GYPNUM SOLD BY PRODUCERS IN THE UNITED STATES, IN 1927, BY USES.**  
(U. S. Bureau of Mines)

	Short Tons	Value
Without calcining:		
To cement mills	928,807	\$2,287,548
For agriculture	29,452	129,825
For other uses	7,612	21,290
	965,871	\$2,388,663
Calcined:		
Stucco	421,987	2,493,910
Neat plaster	2,089,945	14,324,857
Sanded plaster	207,210	1,414,749
Plaster of Paris, molding, etc.	173,080	1,542,916
Keenes cement	41,431	674,698
To plate-glass works	18,372	152,203
Plasterboard and wallboard	664,301	15,835,527
Tile and blocks	252,745	2,388,421
Other purposes	63,140	988,510
	3,912,211	\$39,785,791
Grand total value	.....	42,174,454

**GYPSY MOTH.** See ENTOMOLOGY, ECONOMIC.

**GYRO PILOT.** See NAVIGATION.

# H

**H AAB**, ROBERT (1865- ). A President of the Swiss Confederation, born at Waedenswil. He studied law and practiced there, where he was elected mayor of the commune in 1894 and deputy to the Zurich Grand Council. Made a member of the Supreme Court in 1899, he became president of that body in 1908 and in 1911 director general of the Federal railways. He was minister to Berlin in 1917-18 and on his return was elected to the Federal Council. In 1922 and again in 1929, he was President of the Confederation.

**HAAN**, WILLIAM GEORGE (1863-1924). An American army officer, born at Crown Point, Ind. He graduated from the United States Military Academy in 1889 and began his military career as lieutenant in the 1st Artillery. When the World War broke out in 1914, he was a member of the General Staff. In 1917 he commanded the 57th Field Artillery Brigade at Camp MacArthur, Texas, and in 1918 the 32d Division at the Marne, Oise-Aisne, and the Meuse-Argonne offensives. He commanded the 7th Army Corps in the Army of Occupation in Germany from November, 1918, to April, 1919. On his return to the United States in 1919, he was appointed assistant chief of staff and director of war plans division of the General Staff, and was made a major general in the Regular Army on Mar. 8, 1921. He retired from the service one year later.

**HAAS**, HÄS, ARTHUR E. (1884- ). An Austrian professor of physics at the University of Vienna, born at Brunn and educated at the gymnasium and the universities of Vienna and Göttingen. He taught at the University of Vienna in 1912, and in 1913 was appointed professor in the University of Leipzig. He returned to Vienna in 1921. He published many scientific articles, and also the following works: *Entwicklungsgeschichte des Satzes von der Erhaltung der Kraft* (1909); *Geist des Hellenismus in der Modernen Physik* (1914); *Grundgleichheit der Mechanik, dargestellt auf Grund ihrer Geschichtlichen Entwicklung* (1914); *Einführung in die Theoretische Physik* (1919); *Naturbilder der Neuen Physik* (1920); *Vektoranalysis* (1922); *Atomtheorie* (1924), trans. in English; *Mechanik der Massenpunkte und des starren Körpers* (1926); *Die Welt der Atome* (1926).

**HAASE**, HÄ'ZE, HUGO (1863-1919). A German politician, born at Allenstein, East Prussia, and educated at the University of Königsberg. He began practicing law in 1889, and was a member of the Reichstag from 1897 to 1907, being elected again in 1912. In 1914 he was the leader of the Social Democratic Party in the Reichstag, but in 1916 he became the leader of the Independent Socialists. After the revolution of 1918, he was chosen to be one of the six commissaries who conducted the first provisional government of the new Republic. His socialistic views were

moderate. He was fired on by an assassin on Nov. 7, 1919, and died from the wounds received.

**HABER**, hä'bër, FRITZ (1868- ). A German chemist (see Vol. X). He directed the Kaiser Wilhelm Institut for physical chemistry and electrochemistry in Berlin, specialized on electrochemical investigations, and received the Nobel Prize for chemistry in 1919. He published *Aus Leben und Beruf* in 1927.

**HABERMANN**, HUGO VON (1849- ). A German painter who was born in Dillingen, studied at the university there and the Academy of Munich, and traveled in France and Belgium. He is valued for his figure pieces, among them "Picta," "The Monk," "Herodias," and for his portraits. After 1905 he was professor and honorary member of the Munich Academy and also president of the Munich Secession.

**HACKETT**, FRANCIS (1883- ). A literary critic, born in Kilkenny, Ireland. He was educated in Ireland and came to America in 1900. He was with a law firm in New York in 1902, did editorial work for the *Chicago Evening Post* (1906-11), and was associate editor of the *New Republic* (1914-22). Besides numerous articles in magazines, he wrote *Ireland, A Study in Nationalism* (1918); *Horizons* (1918); *The Invisible Choir* (1920); *The Story of the Irish Nation* (1922); *That Nice Young Couple* (novel, 1924); and *Henry the Eighth* (1928). He has been one of the exponents of the modern school of literary criticism and has devoted much attention to modern political movements.

**HACKETT**, JAMES KETELTAS (1869-1926). An American actor (see Vol. X), best known for Shakespearean characterizations. He played *Macbeth* (1916); *Out There* (1918); *The Better 'Ole*; *The Rise of Silas Lapham* (1919); *Macbeth* (in London and Paris, 1920); *Othello* (Paris and London, 1922). During the spring of 1924, he played *Macbeth* in New York, with Clare Eames as Lady Macbeth.

**HADFIELD**, SIR ROBERT A, FIRST BARONET (1858- ). An English metallurgist and inventor, chairman, and managing director of Hadfields, Limited, iron and steel manufacturers of Sheffield (see Vol. X). He received the distinguished American honor of the John Fritz Gold Medal in 1921, was elected a foreign associate of the National Academy of Sciences of the United States in 1928. He was made a baronet in 1917.

**HADLEY**, ARTHUR TWINING (1856- ). An American university president (see Vol. X). Included among his later works are *Undercurrents in American Politics* (1915); *The Moral Basis of Democracy* (1919); *Economic Problems of Democracy* (1923), and *The Conflict between Liberty and Equality* (1925). He resigned from the presidency of Yale University in 1926.

**HADLEY**, HENRY KIMBALL (1871- ). An American composer (see Vol. X). He resigned as conductor of the San Francisco Symphony Orchestra in 1915 and returned to New

York, to devote his entire time to composition. In 1920, he was appointed associate conductor of the Philharmonic Society, in 1924 regular conductor of the Worcester Festival, and in 1925 musical director of Tufts College. In 1921 and 1922 he conducted the first half of the Philharmonic Society's series of summer concerts at the Stadium, and during the winter of 1921-22, appeared as guest conductor of the San Carlo Opera Company. In 1924 he conducted several of his own works in London, and in 1927 scored great success with a series of symphony concerts in Buenos Aires. He wrote four operas, which were all produced soon after their completion: *Azora*, *Daughter of Montezuma* (Chicago Op. Co., 1917); *Bianca* (won the Hinshaw Prize, New York, 1918); *The Garden of Allah* (New York, 1918); *Cleopatra's Night* (Met. Op. House, 1920). The more important of his recent works include two overtures, *Othello* and *The Spirit of the Elements*; a tone-poem, *The Ocean*; two cantatas, *Prophecy and Fulfillment* and *Mirtil in Arcadia*; *Ode to Music* for chorus and orchestra (Worcester Festival, 1917); an oratorio, *Resurgam* (Cincinnati Festival, 1923); and an opera, *The Fire Prince* (1926).

**HAESCHE, WILLIAM EDWIN** (1867- ). An American composer, born at New Haven, Conn. He studied violin with B. Listemann, piano with E. Peraho and composition with H. W. Parker at Yale, where he graduated in 1897. During 1903-24 he taught instrumentation at Yale, and then became professor of theory at Hollins College, Hollins, Va. He also was conductor of several choral societies in New Haven, and in 1907 was one of the founders of the New Haven Symphony Orchestra, in which he played among the first violins. His compositions include a Symphony in A; two symphonic poems, *Fritjof and Ingeborg* and *The South*; two overtures, *Fritjof Saga* and *Springtime*; *Symphonietta*; a dramatic cantata, *The Haunted Oak of Nannau*; a ballad for female voices and orchestra, *Young Lovel's Bride*; *Red Godwin's Wooing* for soprano solo, female chorus and orchestra; and some chamber music.

**HAENIUM.** See PHYSICS.

**HAGEDORN, HERMANN** (1882- ). An American author, born in New York City, and educated at Harvard University, University of Berlin, and Columbia University. From 1909 to 1911, he was instructor in English at Harvard. He published, among other works: *The Silver Blade* (1907); *The Woman of Corinth* (1908); *A Troop of the Guard, and Other Poems* (1909); *Poems and Ballads* (1912); *Faces in the Dawn* (1914); *You Are the Hope of the World* (1917, 1920); *Theodore Roosevelt* (1919, 1921); *That Human Being, Leonard Wood* (1920); *Roosevelt in the Bad Lands* (1921); *Roosevelt, Prophet of Unity* (1924); *Ladders through the Blue* (poems, 1925); *The Rough Riders* (novel, 1927). He is editor of the *Memorial Edition of the Works of Theodore Roosevelt* (1923-25).

**HAGEMANN, C. A. CARL** (1871- ). A German stage manager and author. He studied at Rostock, Berlin, and Heidelberg, managed theatres at Mannheim and Hamburg, and Wiesbaden, and later became a director of the Berliner Rundfunkenbetrieb, a radio broadcasting station. He has written *Geschichte des Theaterzettels* (1900); *Regie, die Kunst der scenischen Darstellung* (1921); *Die Kunst der Bühne* (1923), a life of Oscar Wilde; and other works.

**HAGEN, hä'gen, JOHANN GEORG** (1847- ). An Austrian Jesuit and astronomer (see VOL. X). He was professor of mathematics and physics at American colleges, among them Georgetown University, and in 1906 became director of the observatory at the Vatican. He published *Die veränderlichen Sterne* (Vol I, 1912-21; Vol II, 1924).

**HAGEN, WALTER C.** (1892- ). An American professional golfer, born at Rochester, N. Y. He rounded out a record that never has been equalled for tournament play by winning the British open championship in 1924, 1928, and 1929, after having been the first American player to bring this coveted trophy across the seas in 1922. He also has been the American open title holder twice, North and South open champion twice, Western open champion twice, metropolitan open champion twice, French open champion once, and Professional Golf Association champion, 1924-27. In the international competition for the Ryder Cup, at Worcester, Mass., in 1927, Hagen led the American golf forces against Great Britain and won.

**HAGGARD, SIR (HENRY) RIDER** (1856-1925). An English novelist (see VOL. X). He made a tour of the world as a member of the Dominions Royal Commission (1912-17). During the World War, he visited the Dominions for the Royal Colonial Institute of which he was elected vice president in 1917. He was a member of the Empire Settlement Committee (1917), of the East Africa Committee (1924), and of the Council of the Imperial Society of Knights. Among his later works are *The Holy Flower* (1915); *The Ivory Child* (1916); *Love Eternal* (1918); *The Ancient Allan* (1920); *The Virgin of the Sun* (1922); and *Heu-Heu: or the Monster* (1924).

**HAGGERTY, MELWIN EVERETT** (1875- ). An American psychologist. He was born at Bunker Hill, Ind., and was educated at Chicago and Harvard universities. After teaching at Indiana University, he became, in 1915, professor of educational psychology at the University of Minnesota. He was director of the psycho-educational clinics at that institution, and in 1920 he was made dean of the College of Education. After the Armistice, he was attached to the Surgeon General's office, in charge of the reeducation of disabled soldiers. He served on the Virginia Education Commission and on the school surveys of North Carolina (1920) and New York State (1921).

**HAGOOD, JOHNSON** (1873- ). An American army officer, born at Orangeburg, S. C. He graduated from the United States Military Academy in 1896, and began his military career as second lieutenant of the 2d Artillery and was promoted through the grades to major general in 1925. He served in the Philippines (1913-15), and commanded the First Expeditionary Brigade, Coast Artillery Corps, arriving in France on Sept. 11, 1917. He headed the board that created the service of supply and was its chief of staff until the Armistice. He took part in the Meuse-Argonne offensive, and on Nov. 31, 1918, established headquarters at Hohn, Germany. He returned to the United States in 1919, commanded the South Atlantic Coast Artillery District during 1920-21, and was sent again to the Philippines in November, 1921. In 1924-27 he held commands in the United States, but since Apr. 25, 1927, has been in command of the Philippine Division. He



wrote *The Services of Supply—a Memoir of the Great War* (1927), and many professional papers.

**HAGUE**, hāg, TĒE. The seat of the government of the Netherlands and residence of the sovereign. The population, according to the census of 1920, was 353,286 and, according to the communal population lists for Dec. 31, 1927, 416,179. The municipal government is entrusted to a burgomaster, five aldermen, and a town council of 45 members. In the northern part of the city, articles of luxury such as gold and silver work and porcelain are manufactured, while in the western part are dyeing, chemical, machinery, and cocoa factories. In 1917 a German Realgymnasium and in 1923 an Academy of International Law were added to the city's educational institutions. The Buitenhof, Binnenhof, and Ridderzaal (Hall of the Knights) have been recently restored, the Ridderzaal being used for extraordinary sessions of the States General, or Parliament. In contrast to these mediæval structures are the *Petrolca* and the Rotterdam Bank, two impressive examples of modern Dutch architecture. The Hague is the seat of the highest Dutch courts of justice; of the Permanent Court of Arbitration, created by the First Hague Peace Conference in 1899—a tribunal which has settled some 19 international disputes; and of the Permanent Court of International Justice (World Court), created by the League of Nations under article 14 of its covenant, the first meeting being held on Jan. 30, 1922, in the Palace of Peace.

**HAHN**, hān, HERMANN (1868- ). A German sculptor, born in Bavaria. He was apprenticed to a woodcarver, then studied industrial art, and finally entered the Academy at Munich. His principle works are a "Goethe" monument in Chicago (1914); "Emil Rathenau" in Berlin (1916); "Goethe" in Wiesbaden (1919); "Blücher" in Kiel (1920); and an equestrian bronze in Hamburg (1919). His most recent works are a Bavarian monument for Munich, a war monument for Ludwigshof, a monumental fountain for Cassel, a bronze bust of Walter Rathenau in the Rathenaumuseum of Berlin, and one of Privy Councillor E. R. Van Dyck for the Technical High School of Munich (1927).

**HAIG**, DOUGLAS, FIRST EARL (1861-1928). An English general, born in Fifeshire and educated at Brasenose College, Oxford. He joined the 7th Hussars in 1885, and served in the Sudan (1898); in South Africa (1899-1902), as inspector general of cavalry in India (1903-06), as director of military training (1906-07), as director of staff duties at Army Headquarters (1907-09), again in India, as chief of staff (1909-12), and at Aldershot as general officer in command (1912-14). He commanded the 1st Army in France (1914-15), distinguished himself in the retreat from Mons, at the Aisne, Ypres, and Neuve Chapelle. From December, 1915, until 1919, he was commander-in-chief of the British Expeditionary Forces in France and in Flanders. He became a general in 1914, a field marshal in 1917, and served as commander-in-chief of the forces in Great Britain (1919-20). He was created an earl in 1919. In his last years, he devoted much of his time to aiding veterans and their dependents. He was chairman of the United Services Fund (1921-28). The Allied nations, as well as Great Britain, awarded him their highest honors. The House

of Commons voted him a grant of £100,000 (1919), and a popular subscription of nearly \$1,500,000 bought him Bemersyde, the Haig ancestral estate. He wrote *Cavalry Studies* (1907). Consult *Lord Haig*, by Sir George Arthur (1928), and *Life of Lord Haig*, by Brigadier General John Charteris (1928). (See **WORLD WAR**, *Western Front*).

**HAINES**, THOMAS HARVEY (1871- ). An American psychologist, born at Moorestown, N. J., and educated at Haverford College and Harvard University. He studied neurology and psychiatry at Munich, Zurich, and London, and received a medical degree from the Ohio State University. He was first assisting physician at the Boston Psychopathic Hospital (1913-14) and clinical director of the Ohio Bureau of Juvenile Research (1914-17). From 1915 to 1920, he was professor of nervous and mental diseases at Ohio State University, and in 1922-25, was director of the division on mental deficiency, National Committee on Mental Hygiene. Author of the mental deficiency bills of Tennessee and Mississippi, he took an active part in social work. His published writings include a monograph on *Mental Measurement of the Blind* (1915).

**HAINISCH**, MICHAEL (1858- ). A president of the Austrian Republic. He was the son of Frau Marianne Hainisch, a prominent worker for the advancement of women, became a lawyer by profession, and served as an official of the treasury department. For many years, he took no active part in politics but devoted his time to reading and study. He was chosen Federal President in 1921, largely because of his friendliness with all political parties, and reflected in 1924. He retired in 1928, having served the constitutional limit of two terms. Among his numerous works on sociological and political subjects are *Zukunft der Deutsch-Oesterreicher* (1892); *Der Kampf ums Dasein und die Sozialpolitik* (1899); *Die Landflucht* (1924). See **AUSTRIAN REPUBLIC**.

**HAITI**, hā'tē. An independent republic occupying the western four-elevenths of Haiti Island. Santo Domingo is the name of the remaining portion. See **SANTO DOMINGO**. Area of the Republic estimated at from 10,204 to 11,072 square miles. Population in 1912 (estimate), 2,500,000; in 1927 (estimate), 2,300,000. Negroes make up 90 per cent of the population. Port-au-Prince, the capital, had about 125,000 inhabitants in 1928, including suburban sections. The city property, in 1929, by public health census, had 79,797 inhabitants.

**Industry, Trade, Government.** Agriculture engages the majority of the population. Coffee culture occupies the place of leading importance, its export quantity in 1927 constituting 88 per cent of the total trade. Other important crops are cotton, sugar, tobacco, the production of the last named reaching 2,500,000 pounds in 1927-28. Logwood and other valuable woods enter into the foreign trade. In the fiscal year 1927, exports totaled \$15,299,000 as against \$20,248,000 in 1926, and \$17,285,485 in 1913. For the same years, imports were \$15,751,000, \$18,851,000, \$9,876,555. The financial adviser-general receiver reported for the fiscal year ended Sept. 30, 1928, exports valued at 113,336,000 gourdes and imports valued at 101,241,000 gourdes or a favorable balance in 1927-28 of 12,095,000 gourdes, as against an adverse balance of 2,262,000 gourdes in 1926-27. The gourde is equivalent to \$0.20

U. S. gold. In the calendar year 1928 the exports totaled \$21,546,748 as against \$16,549,875 in 1927, being the greatest of any recent year largely due to the coffee crop. The imports in the calendar year 1928 were \$21,316,213 as against \$16,524,938 in 1927. Imports come largely from the United States, while the exports go to France. American intervention in 1915 led to the appointment, in the following year, of a group of American officials to the posts of financial adviser, receiver general of customs, chief engineer, sanitary engineer, and chief of gendarmerie. The result was an increased stability in fiscal affairs. Expenditures for 1913-14 had been \$8,127,000; revenues, \$6,282,000. In 1928-29 revenues were \$7,580,000 and expenditures \$7,579,697. The total customs receipts for the year 1927-28 were 45,082,092.80 gourdes, and the total export duties, 14,040,033.56 gourdes. The latter were levied on coffee, logwood, cacao, cotton, sugar, and some miscellaneous products. In 1912, the public debt amounted to \$12,763,000 and 119,286,000 francs, besides an unfunded debt of \$7,077,000. On Sept. 30, 1928, the total public debt was \$18,887,623. By Jan. 31, 1929, it had been reduced to \$17,990,800. In October, 1922, great interest was aroused in Haitian affairs by the action of the National City Bank of New York, which floated for Haiti a bond issue of \$16,000,000 to be secured by a second charge on customs and a first on internal revenues. The Haitian government received 92 per cent of the nominal value. The loan was used for the conversion of outstanding loans, particularly the French loan. As a result of American activity, Haiti is provided with a well-trained constabulary, officered by American marines. The constabulary consists of 2720 men.

**History.** The internal disorders and upheavals which Haiti had experienced in preceding years continued throughout 1914. President Divilman Theodore was overthrown on Feb. 8, 1914, by Oreste Zamor, but regained control in October, only to be ousted again by Vilbrun Guillaume Sam early in March, 1915. President Sam was killed in an uprising at Port au Prince in July, 1915, whereupon American troops, which had previously been landed several times because of disputes between Haiti and her English, French, and German creditors, took possession of the country. Martial law was declared and all armed opposition was stamped out, although the Haitian civil government remained nominally in power. On Aug. 10, 1915, Sudre Dartiguenave was elected President by the Haitian Assembly and on Sept. 16, 1915, a convention was signed between the United States and the Haitian government. Effectively coerced by American control of all funds, the Haitian Chamber ratified the convention on Oct. 6, 1915 and the Senate, on November 3. Pending ratification by the United States Senate, which took place in May, 1916, a *modus vivendi* was reached for the immediate application of the treaty. The convention established a receivership of customs under American control, a native constabulary force commanded by American officers, and American control over Haitian finances to an extent necessary to safeguard the interests of the Haitian people and their American creditors. It was to remain in force ten years with the possibility of extending it if either signatory should so desire. Haiti thus became what was virtually an American political and fiscal protectorate for a term of

years, during which the United States agreed to intervene for the maintenance of Haitian independence and an orderly government if that should become necessary.

On July 20, 1918, Haiti entered the World War on the Allies' side, ostensibly because of the sinking by German submarines of a French vessel which had Haitian citizens aboard. Although under the control of the United States, Haiti became a member of the League of Nations. In 1918 a new constitution was drafted and, on submission to a plebiscite on June 19, approved by a large majority. The chief novelty of this constitution was a clause providing that foreigners residing in the country and societies formed by them should have the right to own real property. Although constitutional government was formally in existence, the actual administration was in the hands of American officials. The American occupation resulted in a marked improvement of the economic and social conditions of the country. Particularly, town sanitation and construction of modern roads progressed rapidly. Public order was guaranteed by the establishment of an efficient gendarmerie. These benefits, obvious results of the American occupation, nevertheless failed to reconcile a large part of the Haitian people with the existing status. Charges were advanced in Haitian and American quarters that the American force of occupation, composed exclusively of whites, was guilty of revolting acts of brutality against the Negro population of Haiti. The charges resulted during 1921 in an investigation by a committee of the United States Senate, the report of which, on the whole, exonerated the American troops. On Oct. 9, 1922, the National City Bank of New York as stated above, offered a Haitian loan of \$16,000,000 in 30-year bonds, at 6 per cent. This aroused protests from the Haitians and criticism in the United States. By the unanimous vote of the Legislature, Luis Borno was elected President on Apr. 11, 1922, to replace President Dartiguenave, whose term had expired. In the spring of 1924, the American government withdrew its forces from the interior, leaving only skeleton forces in certain seaports. At the same time, it was declared that because of the inability of the Haitians to guarantee the continuance of orderly government, complete evacuation was not yet in sight.

American control was further strengthened in June, 1924, by the creation of an internal revenue bureau, which was to have charge of the collection of all taxes except customs duties. Its chief was to be appointed by the President. In 1926 President Borno was reelected for a four-year term by the Council of State, whose 21 members he himself had appointed. In the summer, he visited the United States, meeting a hostile demonstration in New York from elements opposed to United States intervention. Although the programme of political and economic improvement continued to make steady progress year by year, the sentiment against intervention among the Haitians appeared to remain as strong as ever. In the United States, certain liberal and anti-imperialist publicists continued likewise to denounce the interventionist policy. This feeling was intensified in 1927 when the Haitian government refused to permit U. S. Senator King to enter the country on the ground that his record of strong criticism of intervention would rally the discontented elements in Haiti and possibly provoke disorder.

A boundary treaty between the Dominican Republic and Haiti was signed Jan. 21, 1929, and ratified by both republics in the following month. Survey commissions were appointed from both countries and the boundary was to be determined after their surveys.

**HALBE, hăl'be, MAX** (1865- ). A German dramatist and novelist (see VOL. X). His later works are *Io*, a novel (1918); *Schloss Zeitvorbei*, a drama (1918); *Horlense Ruland*, a tragedy (1920); and *Kikeriki*, a comedy (1921). An edition of his complete works in seven volumes was published (1917-23).

**HALDANE, hăl'dän, JOHN SCOTT** (1860- ). A British physiologist (see VOL. X). He became director of the Mining Research Laboratory at Birmingham University, was gas referee for the Board of Trade, president of the Institution of Mining Engineers, and Gifford Lecturer at Glasgow University. His later works include *Organism and Environment* (1917); *The New Physiology* (1919); *Mechanism, Life and Personality* (1921); *Respiration* (1922), and *The Sciences and Philosophy* (1929).

**HALDANE, THE RT. HON. RICHARD BURDON, FIRST VISCOUNT OF CLOAN** (1856-1928). A British philosopher, jurist, and statesman (see VOL. X). In 1915 he resigned from the Liberal cabinet as Lord High Chancellor, a position which he held again in 1924 under the Labor government. He was on the Judicial Committee of the Privy Council, Chancellor of the University of Bristol, a Fellow of the Royal Society, a Knight of the Thistle, and held the Order of Merit. He wrote: *Before the War* (1920) which told of Great Britain's policy toward Germany in the 8 years preceding the World War, and of his trip to Germany (1912) in an effort to stop her naval building programme; *The Reign of Relativity* (1921) in which he sought to link the physical theory with the general philosophy of idealistic relativism; *The Philosophy of Humanism* (1922), which was the ethical counterpart to the idealistic criticism of science; *Human Experience; a Study of its Structure* (1926); *Selected Addresses and Essays* (1928); and *Richard Burdon Haldane: An Autobiography* (1929).

**HALE, FREDERICK** (1874- ). A United States Senator, who was born at Detroit, Mich., and graduated from Harvard (1896). He was admitted to the bar and has practiced at Portland, Me., since 1899. In 1905 he was a member of the Maine Legislature. He was elected to the United States Senate as a Republican for three terms (1917-35), and was a member of the following Senate committees: Naval Affairs (chairman), Appropriations, Expenditures in Executive Departments, Manufactures, and Rules.

**HALE, GEORGE ELLERY** (1868- ). An American astronomer (see VOL. X). He received the Bruce Medal of the Astronomical Society of the Pacific in 1910, the Janssen Medal of the Astronomical Society of France in 1917, the Galileo Medal, Florence, in 1920, the Actonian Prize given by the Royal Institution in 1921, the Cresson and Franklin medals of the Franklin Institute in 1926 and 1927, and the Arthur Noble Medal for civic service (Pasadena) 1927. In 1923 he retired from the active directorship of the Mount Wilson Observatory, which he had organized, becoming honorary director in charge of policy and development. See PHYSICS.

**HALÉVY, à'là've', DANIEL** (1872- ). A French man of letters who was educated at the Sorbonne, and devoted himself to history and criticism. By family tradition, he inherited a cultural liberalism which found expression in the ideology of Dreyfusism. Before the World War, he was affiliated with the group of Charles Péguy and the *Cahiers de la Quinzaine*, and after the Armistice, he tried to revive Péguy's tradition on a more modest scale by editing the collection of the *Cahiers Verts*. His works include: *Essai sur le mouvement ouvrier en France* (1901); *La Vie de Frédéric Nietzsche* (1911, trans.); *Luttes et problèmes* (1911); *La Jeunesse de Proudhon; Avec les boys Américains* (1918); *Le Président Wilson* (1918, tr. 1919); *Charles Péguy et les Cahiers de la quinzaine* (1919); *Le Courrier de M. Thiers* (1921); *Une Visite aux paysans du Centre* (1921); and *Vauban* (1923).

**HALÉVY, ELIE** (1870- ). A French philosophical writer who was born at Étretat, and educated at the Lycée Condorcet and the École Normale Supérieure. In 1898 he became professor at the École Libre des Sciences Politiques in Paris, and in 1926 he received the honorary D.Litt. of Oxford. His works include an analysis of Plato's philosophy of science, *La Théorie Platonicienne des Sciences* (1896); three volumes on the English utilitarians and radicals, *La Formation du Radicalisme Philosophique* (1900-03; English translation, 1 vol., 1928); *Histoire du Peuple Anglais au XIX<sup>me</sup> Siècle* (3 vols., 1913-23), translated into English in 1924-26, and continued in *Epilogue, 1895-1914* (1926), and *The Growth of Philosophical Radicalism* (1928).

**HALIDÉ EDİB** (1885- ). A Turkish leader in the movement for emancipation of women, who was born in Constantinople, and was the first Moslem girl to graduate from the American College for Girls in Constantinople (1901). She married in the same year but divorced her husband when he married a second wife. She was an intellectual, a journalist, a successful fiction writer, a liberal, and a supporter of the Young Turk movement, which necessitated her flight from Constantinople in 1909. Returning in 1916, she remarried, in the following year became professor of Western literature at the University of Istanboul, and after the Armistice, condemned to death by the Sultan, she and her husband worked with Kemal in the Nationalist cause. She was a delegate to the Nationalist Assembly, enlisted in the army and served in the war with the Greeks, rising to the rank of sergeant. After the Nationalist victory, Kemal suspected plots, and she and her husband fled to London, where they remained in exile. In 1928 she went to the United States to speak before the Williamstown Institute of Politics. Besides novels, she wrote *Memoirs of Halidé Edib* (1926), and *The Turkish Ordeal*, further memoirs (1928).

**HALL, FRANCIS JOSEPH** (1857- ). An American Protestant Episcopal theologian (see VOL. X). He was professor of dogmatic theology in the General Theological Seminary, 1913-28. Among his later works are *The Incarnation* (1915); *The Bible and Modern Criticism* (1915); *The Passion and Exaltation of Christ* (1918); *The Church and the Sacramental System* (1920); *The Sacraments* (1921); *Eschatology* (1922); *Christianity and Modernism* (1924).

**HALL, GRANVILLE STANLEY** (1846-1924). An American educator (see VOL. X). He became editor of the *Journal of Applied Psychology* in 1917 and has published *Jesus the Christ in the Light of Psychology* (1917); *Morale: The Supreme Standard of Life and Conduct* (1920); *Recreations of a Psychologist* (1920); and *Senescence* (1922). He was a frequent contributor to magazines and scientific publications. He retired from the presidency of Clark University in 1920.

**HALSTEAD, ALEXANDER SEAMAN** (1861-1923). An American naval officer, born at Philadelphia, Pa. He graduated from the United States Naval Academy in 1883 and was promoted through the grades, becoming captain in 1911. He served in the Spanish-American War and took part in the battle of Manila Bay. After commanding several battleships, he became supervisor of New York Harbor in 1915. He was commander of the district of Brest, France, during 1918-19, and commanded the naval forces in France in 1919. In October, 1919, he became commandant of the Navy Yard at Portsmouth, N. H., and remained there until 1920, when he was appointed commandant of the 12th Naval District at San Francisco. He was raised to the rank of rear admiral on July 1, 1919, and retired on Nov. 12, 1923.

**HAM, CLIFFORD DUDLEY** (1861- ). An American government official, who was born at Detroit, Mich., and graduated at Yale (1883). He was secretary to the Governor of Iowa and in newspaper work at Dubuque, Iowa, several years. In the Spanish-American War, he served as lieutenant colonel of volunteers. He edited the *Dubuque Herald* (1899-1903) and from 1903 to 1911 was in the Customs Service of the Philippine Islands as collector of customs at Iloilo and surveyor of the Port of Manila. By appointment of the President of Nicaragua, he was collector of customs for the Republic of Nicaragua and also acted as fiscal agent for the bonded foreign loans of Nicaragua from 1911 to May 31, 1928, when he resigned. Mr Ham codified the Nicaraguan laws pertaining to customs, ports, maritime commerce, and vessels.

**HAMBIDGE, JAY** (1867-1924). An American artist, born in Canada. He was a pupil of the Art Students' League in New York and of William Chase, and a thorough student of classical art. He conceived the idea that the study of arithmetic with the aid of geometrical designs was the foundation of the proportion and symmetry in Greek architecture, sculpture and ceramics. Careful examination and measurements of classical buildings in Greece, among them the Parthenon, the Temple of Apollo at Bassæ, of Zeus at Olympia and Athens at Ægina made him formulate the much discussed theory of dynamic symmetry, as demonstrated in his work, *Dynamic Symmetry: the Greek Vases* (1920). He found a disciple in Dr. Lacey D. Caskey, the author of *Geometry of Greek Vases* (1922).

**HAMBURG, hām'bûrg**. Germany's largest port, the capital of the Free State of Hamburg, and, after Berlin, her largest city. The population, according to the census of 1925, was 1,079,126. A tunnel for pedestrians and vehicles has been constructed under the Elbe, and three bridges, including the newly-opened two-story Freihafenbrücke, connect the banks of the river. Among the important new buildings are the Chile House and the Ballin House, two 10-

story office buildings built entirely of vitreous brick; the Trade Corporation House; the municipal auditorium; and the Museum of Hamburg Antiquities, opened in 1920 and containing a unique collection of ship models, guild antiquities, arts and crafts, writing and printing. A strong futuristic style of architecture is characteristic of most of the newly erected buildings. In 1919 the University of Hamburg was founded and partly housed in a lecture hall built in 1911. In 1928, 2605 students matriculated. The University makes a specialty of the study of foreign countries and institutions. Hamburg is one of the principal airports of the great air transport net of Europe and is ideally situated for this purpose because of its important and advantageous rail and steamship connections. Direct connections may be made with Bremen, Amsterdam, Copenhagen, Cologne, Berlin, Hanover, Magdeburg, Kiel, and Wesermünde and from these cities with any airport of Europe.

**Shipping.** The Free Port of Hamburg contains 3333 acres, and the quays accommodate upward of 450 seagoing vessels and 5000 smaller coast and river craft, vessels drawing 32 feet of water being able to reach them at high tide. In 1913 the shipping firms of Hamburg owned 784 vessels aggregating 1,643,000 tons, but in accordance with the Treaty of Versailles, the commercial fleet was reduced to 82,000 tons and consisted of only small vessels, not suitable for ocean service. The revival of the fortunes of the port was one of the most remarkable features of commercial history. Ships were rebuilt and services reconstructed so that in 1923 the shipping movement of the port surpassed all previous records, 15,344,116 tons being entered and 15,619,172 tons cleared. In 1927, 16,011 ships of 19,595,541 tonnage entered the port, and 20,088 ships of 19,727,470 tonnage were cleared. In 1928 the incoming ocean shipping aggregated 17,267 vessels of 21,290,000 tons. The table on page 700 shows the comparative shipping figures for seagoing ships entering the port of Hamburg.

As the main rôle of Hamburg is the transshipment of goods from and to all parts of the world, the number of ships which clear the port is larger than the number entering. In 1913, 16,627 ships of 14,440,026 tonnage were cleared; in 1921, 9842 ships of 9,442,798 tonnage; in 1922, 12,782 ships of 13,302,568 tonnage; in 1923, 15,984 ships of 15,019,172 tonnage; in 1924, 15,137 ships of 15,774,505 tonnage; in 1925, 15,415 ships of 16,877,000 tonnage; in 1926, 16,907 ships of 17,038,000 tonnage; and in 1927 20,088 ships of 19,727,000 tonnage.

Hamburg and Prussia, after several years of interstate friction, finally decided on Dec. 5, 1928, upon an administrative scheme which would in effect place the entire lower Elbe district under joint management, with revenues and expenditures to be shared alike and uniform police regulation and uniform port dues throughout the entire port area. Recent port improvements include the enlargement of the old petroleum harbor and of the Vulcan Harbor to meet the increased dock requirements of the Hamburg-American line and the construction of the new Waltershof Harbor. By the Treaty of Versailles, harbor accommodation in the Port of Hamburg was granted for 99 years to Czechoslovakia. On Nov. 3, 1928, an agreement was formulated that parts of the Saale and Moldau basins should be leased to the Czech govern-

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SEAGOING SHIPS ENTERING THE PORT OF HAMBURG

	1913			1921			1922			1923			1924			1925			1926			1927		
	No. of Ships	Net Reg.-Tons	No. of Ships	No. of Ships	Net Reg.-Tons	No. of Ships	No. of Ships	Net Reg.-Tons	No. of Ships	No. of Ships	Net Reg.-Tons	No. of Ships	No. of Ships	Net Reg.-Tons	No. of Ships	No. of Ships	Net Reg.-Tons	No. of Ships	No. of Ships	Net Reg.-Tons	No. of Ships	No. of Ships	Net Reg.-Tons	No. of Ships
Total	15,078	14,185,496	8,401	9,421,487	10,787	12,980,384	10,787	12,980,384	13,192	15,344,116	12,537	15,540,497	13,240	16,635,000	14,788	17,423,000	16,011	19,596,000						
German	9,005	8,581,380	4,479	1,895,335	5,280	3,501,587	7,001	5,177,040	6,894	5,798,312	7,418	6,398,000	7,838	6,714,000	9,185	8,049,000								
Foreign	6,068	5,604,116	3,922	7,525,652	5,507	9,478,797	6,191	10,167,076	5,633	9,752,185	5,822	10,237,000	6,950	10,709,000	6,826	11,547,000								
British	3,500	4,095,391	1,589	2,982,399	2,531	4,420,684	2,692	4,747,601	2,394	4,380,528	2,882	4,393,000	3,224	4,633,000	2,544	4,630,000								
Danish	516	157,783	332	314,193	567	350,181	669	398,504	554	385,358	654	429,000	665	458,000	824	575,000								
Dutch	775	381,925	615	967,949	889	1,452,456	1,036	1,596,313	1,123	1,717,381	1,100	1,855,000	1,195	1,927,000	1,409	1,955,000								
French	132	120,238	171	339,524	170	373,383	119	346,589	180	552,257	207	642,000	224	684,000	265	775,000								
Norwegian	593	405,280	821	420,435	485	551,847	764	804,015	507	595,602	524	665,000	595	679,000	627	852,000								
Swedish	852	163,352	103	142,930	112	134,695	178	183,408	141	175,450	249	280,000	306	256,000	244	278,000								
United States	1	3,275	407	1,588,213	304	1,362,927	199	940,511	185	799,563	168	648,000	173	629,000	204	758,000								

\* Given in round figures.

ment at a rental of 1,500,000 crowns (\$44,400) per annum and should be placed under a free-zone regime.

**History and Government.** The World War placed a heavy strain on the commerce of Hamburg, and in the fiscal year 1917 expenditures were twice as large as receipts. There was great unrest, so that most of the population joined in a general uprising on Nov. 5, 1918. A United Workmen's and Soldiers' Council was formed, proclaiming on November 22 the union of Hamburg, Bremen, Ostfriesland, and Schleswig-Holstein in a North Sea republic. The city commandant finally accepted the demands of the Council and was put under revolutionary military control. On November 12, the constitution adopted in 1906 was suspended, and a Constitutional Assembly was called, the elections to it on Mar. 16, 1919, giving an absolute majority to the Social Democrats. The Assembly opened on March 24 and two days later proclaimed a provisional constitution. The republican constitution, adopted Jan. 7, 1921, placed the legislative power of the new Republic, of which Hamburg was the capital, in a House of Burgesses of 160 members chosen for three years, and the executive power in a Senate of 15 members chosen by the Burgesses and presided over by two members chosen by the Senate itself. The Common Council consisted of 20 members of the House of Burgesses and its president. In later elections, the Social Democrats gradually lost their majority so that by October, 1924, the Government was in the hands of a coalition of Social Democrats, Democrats, and the German People's Party. These parties also carried the election of Feb. 20, 1928.

**HAMILTON, Cosmo (?- ).** A British dramatist and novelist, who served in the Royal Naval Air Service during the World War. His novels include *The Outpost of Eternity* (1912); *A Plea for the Younger Generation* (1913); *His Friend and His Wife* (1920); *The Rustle of Silk* (1922); *Unwritten History* (1924); *The Three Passions* (1928); and *Daughters of Folly* (1928). *The Little Gold Ring*, short stories, appeared in 1929. Among his plays are *The Wisdom of Folly*; *Arsène Lupin*; *The Blindness of Virtue* (1913); *The New Poor* (1924); and *Pickwick* in collaboration with Frank C. Reilly (1927).

**HAMILTON, SIR IAN (STANDISH MONTREITH).** (1853- ). A British soldier (see VOL. X) promoted to the rank of general in 1914. At the outbreak of the World War, he was given command of the 4th Army, which he organized in Egypt. In 1915 as commander of the Mediterranean Expeditionary Force, he was in charge of the land forces operating at Gallipoli, but was relieved of this command in October of the same year. The failure of the Gallipoli enterprise resulted in severe criticism of his plan of campaign. He wrote a defense in the form of his *Gallipoli Diary*, in 1920. He was Lieutenant of the Tower of London (1918-20), and was created Knight of the Grand Cross of St. Michael and St. George (1917). He also published *The Millennium?* (1919); *The Soul and Body of an Army* (1921); and *The Friends of England* (lectures to members of the British Legion, 1923).

**HAMILTON, JOHN McLURE** (1853- ). An American portrait painter and illustrator (see VOL. X), residing in England. He served on the jury of awards at the Panama-Pacific



International Exposition, 1915. In 1918 he was awarded a gold medal, Pennsylvania Academy of Fine Arts. A book by him, *Men I Have Painted*, appeared in 1921.

**HAMILTON COLLEGE.** A nonsectarian college of liberal arts for men at Clinton, N. Y.; founded in 1812. The enrollment increased from 200 in 1914 to 438 in 1928-29, and the number of members on the faculty from 20 to 43; the library from 62,000 to 125,269 volumes and 30,000 pamphlets, and the productive funds from \$1,100,000 to \$3,943,989. The covered playing field, called the Sage Building, was completed in 1922; in the following year, six faculty houses were erected; in 1924-25, a biology-geology building, costing \$300,000, was completed, a soccer field was laid out, and during the summer of 1925 the golf course was enlarged from six to nine holes and in 1925-26, the exterior of Knox Hall was restored to its original appearance, the interior adapted for housing the administrative offices, and the name changed to Buttrick Hall, in honor of its original occupants who were grandparents of Elihu Root, chairman of the Board of Trustees of the college at the time. President, Frederick C. Ferry, Ph.D., Sc.D., LL.D.

**HAMLIN, CHARLES SUMNER** (1861- ). An American lawyer and public official (see Vol. X). From 1914 until 1916, he was governor of the Federal Reserve Board, and was reappointed a member of the board for the terms 1916-26 and 1926-36. He published *Index Digest of the Federal Reserve Act* and the *Index Digest of the Federal Reserve Bulletin* (1921).

**HAMLIN UNIVERSITY.** A coeducational college under the control of the Methodist Episcopal Church at St. Paul, Minn., founded in 1854. The student enrollment increased from 251 in 1914 to 500 in 1928, the teaching staff from 15 to 44, and the annual income from \$52,000 to \$180,000. The endowment during the same period rose from \$750,000 to \$1,450,000, and a campaign begun in 1924, to raise \$1,500,000 for further buildings and increased endowment, was successfully brought to a close. A new dormitory for women was completed in 1922 at a cost of \$201,851, and an athletic field and grandstand at a cost of \$43,000. President, Alfred Franklin Hughes, D.D.

**HAMMANN, OTTO** (1852- ). A German journalist and politician, born at Blankenhain. He followed a journalistic career from 1877 to 1893. From 1894 until 1916, he was director of the press section of the German Foreign Office, in this capacity acting as adviser to Prince von Bülow, and, in the nineties, taking the part of Count Caprivi, the Imperial Chancellor, and Baron Marshall von Bieberstein, the Foreign Secretary, against Bismarck's followers. After the formation of the German Republic, he published three volumes of reminiscences, in which he brought to light much of what he knew about the German secret policy: *Der neue Kurs, Erinnerungen* (1918); *Zur Vorgeschichte des Weltkrieges* (1919); *Um den Kaiser, Erinnerungen aus den Jahren 1906-09* (1919). Other works published by him are *Der missverständene Bismarck* (1921); *Bilder aus der letzten Kriegszeit* (1922); and *Deutsche Weltpolitik* (1925, English trans. 1926).

**HAMMARSKJÖLD, K. H. (JALMAR) L.** (1862- ). A Swedish jurist, diplomat and public official, born at Väderum. He was professor of law in Upsala University (1891- ),

secretary of the committee on Swedish-Norwegian union (1895-98), Minister of Justice (1901-02), Minister of Education (1905), and served as Minister to Denmark. As Prime Minister from February, 1914, to March, 1917, he inaugurated agricultural reforms and sought to maintain Sweden's neutrality in the World War. Since 1917 he has been Governor of Upsala. He was elected to Parliament in 1923 and became a member of the Swedish Academy, Swedish member of the International Court of Arbitration at The Hague, president of the League of Nations commission on the codification of international law, and a member of numerous international arbitration courts.

**HAMMERSTEIN, OSCAR** (1847-1919). An American theatre manager (see Vol. X). For the last 15 years of his life, he worked to conquer operatic inertia in New York City, and with his keen understanding of the American public, he succeeded in stimulating public interest in the opera. He built the Manhattan Opera House and brought out many artists of note, among them Mary Garden and Tetrazzini.

**HAMMOND, JOHN HAYS** (1855- ). An American mining engineer (see Vol. X). He was president of the Panama-Pacific Exposition Commission to Europe in 1912, chairman of the World Court Congress (1914-15), and chairman of the United States Coal Commission (1922-23). He is the author of *The Truth about the Jameson Raid* (1918); and *The Engineer* (1924), and co-author (with J. W. Jenks) of *Great American Issues* (1921).

**HAMMOND, JOHN HAYS, JR.** (1888- ). An American inventor, born at San Francisco and educated at the Sheffield Scientific School of Yale University. He invented a wireless-controlled torpedo for coast defense and a system for firing torpedoes from battleships; also incendiary projectiles which were employed in the World War, a radio system for the control of ships, and a system of aeroplane coastal patrol. He devised several improvements in pipe-organ mechanisms and a new type of reflecting modulator for pianos. He also took out a great number of patents for inventions in radio-telegraphy and -telephony, including one that gives complete isolation of the sender and receiver of radio messages, so that there is no "listening in" possible. He was president of the Radio Engineering Company of New York, director of the Hammond Radio Research Laboratories, director of the Radio Corporation of America, and a member of many American and foreign organizations.

**HAMMOND, OGDEN HAGGERTY** (1869- ). An American diplomat. He was born at Louisville, Ky., graduated at Yale (1893), and then engaged in the real estate business in New York City and New Jersey. He was a member of the New Jersey House of Representatives (two terms, 1914-17), and chairman of the New Jersey State Board of Charities and Corrections. He was appointed Ambassador to Spain by President Coolidge in 1925, serving until 1929 when he resigned.

**HAMOR, WILLIAM ALLEN** (1887- ). An American chemist, born at Du Bois, Pa., and educated at the University of Pittsburgh. He was research chemist at the College of the City of New York, 1907-14, assistant to the director of the Mellon Institute of Industrial Research at Pittsburgh, 1914-16, and assistant director since

1916. He was major in the Chemical Warfare Service of the United States Army in the World War and served in France for 10 months as assistant chief of the Technical Division of the Chemical Warfare Service. He wrote: *History of Chemistry* (1909); *The American Petroleum Industry* (1916); *The Examination of Petroleum* (1920); *American Fuels* (1922).

**HAMP, PIERRE** (pseudonym of BOURILLON) (1876- ). A French novelist who was educated in the French technical schools and became a functionary in the railroad administration. It was there that he collected his observations for his series of impressionistic novels on *La Peine des Hommes* (*Men in Labor*). These novels combine, at times very successfully, sociological documentation and artistic presentation of human experience. His works include *Marée fraîche* (1908); *Vin de Champagne* (1909); *Le rail*; *Vieille histoire* (1912); *L'enquête* (1914); *Gens* (1917); *Le travail invincible* (1918); *Les métiers blessés* (1919); *La victoire mécanicienne*; *Les Chercheurs d'Or* (1920); *La Dérive du 4543*; *Compound 300 H. P. No. 243*; *Le Cantique des cantiques* (1922); *Le lin* (1924); *Une nouvelle fortune* (1926), and *Monsieur l'administrateur*, and *Madame la guerre*, plays (1928). Consult "Pierre Hamp, Prophet of the French Proletariat," by Thomas W. Bussom in the *South Atlantic Quarterly*, Durham, vol. 27, pp. 376-389 (1928).

**HAMPDEN, WALTER** (1879- ). An American actor born in Brooklyn, N. Y. He studied at Harvard, 1896-97, and received his bachelor's degree from the Polytechnic Institute, Brooklyn, in 1900. He first appeared on the stage in England, with F. R. Benson's company, in classical repertoire, in 1901, and then for three seasons was leading man at the Adelphi Theatre in London. In 1905 he appeared in *Hamlet*, succeeding the younger Irving. He came to the United States in 1907, supporting Mme. Nazimova, and then appeared in *The Servant in the House* (1908), *The Master Builder*, *The Yellow Jacket*, *Salome*, and other plays. He toured the country widely with his Shakespearian repertoire, his *Hamlet* in particular being a vigorous, fresh, and princely interpretation. His greatest single triumph has been *Cyrano de Bergerac*, which was judged to be the outstanding play in New York City during 1923-24. In 1925-29 he appeared in his own New York theatre co-starring (1925-26) with Ethel Barrymore in *Hamlet* and *The Merchant of Venice* and taking the lead in *Capon-sacchi*, Ibsen's *An Enemy of the People*, and *Cyrano de Bergerac*.

**HAMPTON NORMAL AND AGRICULTURAL INSTITUTE.** This institution, situated at Hampton, Va., two miles from Old Point Comfort, was founded by Gen. Samuel Chapman Armstrong in 1868, for the practical education of Negro and Indian youth. The school opened in 1868 with two teachers and 15 students in a plantation house, gristmill, and army barracks. By 1928 it had developed into an industrial village with an enrollment of 1044, of whom 988 were boarding students. In addition, there was an enrollment of 1132 in the two summer sessions; and the faculty for the regular school session ending May 29, 1928, numbered 125. The institution maintained a well-equipped trade school and a graduate course in the building trades; and the normal, agricultural, domestic science, and business schools,

offered courses of collegiate grade. The Institute is controlled by a board of trustees of which Chief Justice Taft was made president in 1914. The productive funds which amounted to \$9,081,969 in 1928, yielded an income of \$442,064. The library contained 64,738 volumes. Hampton Institute was probably the first school in the United States to combine successfully the training of the hand with that of the mind and character. The Rev. James E. Gregg, D.D., succeeded the late Hollis Burke Frissell as principal in 1918.

**HAMSUN, hām'sun, KNUT** (1859- ). A Norwegian author (see VOL. X), who received the Nobel Prize for literature in 1920. His later publications include *Segelfoss* by (1915; trans. 1925); *Markens grøde* (1917; trans. as *Growth of the Soil*, 1920); *Sproget i fare* (1918); *Konerne ved vandposten* (1920; trans. as *The Women at the Pump*, 1928); *Livets vold*, a play (1921); *Dikte*, poems (1921); *Sisto Kapitel* (2 vols., 1923); *Children of the Age* (1924), and *Landstrykere* (2 vols., 1927). Consult *Knut Hamsun*, by H. A. Larsen, or by Joseph Wiehr (both, 1922), and *Lebensgeschichte eines Rebellen*, by A. Holtscher (1924). See SCANDINAVIAN LITERATURE, under *Norwegian*.

**HANEY, LEWIS HENRY** (1882- ). An American economist, born at Eureka, Ill., and educated at Wesleyan University, Bloomington, Ill. He was a lecturer at New York University in 1908, afterward teaching in the universities of Iowa and Michigan, and from 1912 to 1916, he was professor of economics at the University of Texas. In 1916 he was in charge of the Federal Trade Commission's gasoline investigation, and in 1920-21 he was in charge of the cost of marketing division of the United States Bureau of Markets. In 1920 he became director of the New York University Bureau of Business Research and professor of economics. He wrote: *A Congressional History of Railways* (vol. i, 1908; vol. ii, 1910); *History of Economic Thought* (1911; rev. ed., 1919); *Business Organization and Combination* (1913); *The Business of Railway Transportation* (1924); and various articles on economic subjects for periodicals.

**HANIHARA, MASANO** (1876- ). A Japanese diplomat, who came to the United States in 1901 as attaché, became secretary of the Embassy at Washington in 1902, was then secretarial chief at the Foreign Office, consul general at San Francisco (1916-17), and then returned to Japan as director of political affairs at the Foreign Office (1917-19). He was a member of the Ishii Mission from which came the Ishii-Lansing agreement, and an influential member of the Washington Disarmament Conference. He was Ambassador to the United States (1923-24). He was recalled after his protest against the passage of the immigration law of 1924, excluding Japanese, had been unfavorably received in the U. S. Senate.

**HANNAY, THE REV. JAMES OWEN** ("GEORGE A. BIRMINGHAM") (1865- ). An Irish novelist and clergyman (see VOL. X), who was temporary chaplain to the forces (1916), chaplain to the British Legation in Budapest (1922-24), and rector of Mells (1924- ). His publications include *Minnie's Bishop and Other Stories* (1915); *Gossamer* (1915); *The Island of Mystery* (1918); *Up the Rebels* (1919); *Good Conduct* (1920); *Lady Bountiful* (1921); *A Public Scandal* (1922); *Send for Dr. O'Grady* (drama,

1923); *Found Money* (1923); *A Wayfarer in Hungary* (1925); *Bindon Parva* (1925); *Spillikins* (essays, 1926); *Fidgets* (1927); and *The Mermaid*, an operetta, with Sydney H. Nicholson (1927).

**HANOTAUX**, à'nô'tô', GABRIEL (1853- ). A French historian and politician (see VOL. X), who was a delegate to the League of Nations in 1921. His later writings included *La guerre des Balkans et l'Europe, 1912-13* (1914); *Histoire de la guerre de 1914* (18 vols., 1915-24); *L'Histoire et les Historiens; Le traité de Versailles du 28 juin, 1919* (1919); *L'Aisne pendant la grande guerre* (1919); *Joffre* (1921); *La bataille de la Marne* (2 vols., 1922); *Sur les chemins de l'histoire* (2 vols., 1924); *Le général Mangin* (1925); and *La Provence nicoise* (1928). He edited *Histoire de la nation française* (15 vols., 1920-24).

**HANSEN**, CECILIA (1898- ). A noted Russian violinist, born at Staniza Kamenskaya, Southern Russia. In 1909-14 she studied under Leopold Auer at the Petrograd Conservatory. Before finishing her studies, she made her debut in 1910, but did not really begin her career until 1916, when she undertook extensive tours of Europe winning recognition as one of the foremost of living violinists. She was equally successful in the United States, where she was first heard in 1923. She married the Russian pianist, Boris Zacharov.

**HANSEN**, NIELS ERBESSEN (1866- ). An American horticulturist, born in Denmark. He came to the United States in 1873 and was graduated from the Iowa Agricultural College in 1887. From 1891 to 1895, he was assistant professor of horticulture at the Iowa Agricultural College and after the latter date, professor of horticulture at the South Dakota Agricultural College and Experiment Station. Professor Hansen made explorations for the U. S. Department of Agriculture in Europe, Asia, and Africa, collecting new economic seeds and plants, and originating new fruits, especially the Hansen hybrid plum. He also introduced, from Turkestan and Siberia, new varieties of alfalfa, and imported the Siberian fat-rumped sheep. In 1924 he went to Manchuria for the State of South Dakota. He wrote numerous horticultural bulletins and papers and was also author of *Handbook of Fruit Culture and Tree Planting* (1890), and *Systematic Pomology* (with J. L. Budd, 1903). Professor Hansen was awarded the George Robert White Medal for eminent service in horticulture by the Massachusetts Horticultural Society in 1917.

**HANSON**, HOWARD (1896- ). An American composer, born at Wahoo, Nebr. Having received his first training at the Luther College Conservatory (Nebr.), he continued his studies at the School of Music of the University of Nebraska, at the Institution of Musical Art in New York, under P. Goetschius, and at the Northwestern University, Evanston, under P. Lutkin and A. Oldberg. In 1916-19 he taught theory and composition at the College of the Pacific, San José, Calif., and 1919-21 was dean of the School of Fine Arts. In 1921 he was the first recipient of a newly endowed fellowship in composition, awarded by the American Academy in Rome. The fellowship, determined by a composition in a prescribed form and submitted in open competition, provides for a three years' residence in Rome, with privilege of travel, and an annual allowance of \$2000.

In 1924, after his return to the United States, he was appointed director of the Eastman School of Music of the University of Rochester. He appeared as conductor of his own works with several of the leading American symphony orchestras. In 1923 he conducted a programme of American music with the Augusteo orchestra in Rome. His works include: *Nordic Symphony*, *Symphony No. 2* (with organ); the symphonic poems, *North and West*, *Lux Aeterna*, *Exaltation*, *Before the Dawn*, and *Pan and the Priest*; a *Symphonic Rhapsody*; a piano concerto; two piano quintets; and *The Soul of Sequoia*, a festival play for the California Redwood Park Festival (1920). He was commissioned to write a string quartet for the Berkshire Festival of 1925 and a choral work, *The Lament for Beowulf*, for the Leeds Triennial Festival of 1925. For the Beethoven Centennial, 1927, he wrote *Heroic Elegy*, for chorus and orchestra.

**HANSON**, OLE (1874- ). An American public official, born in Racine County, Wis., and educated privately for the bar. He was elected mayor of Seattle in 1918 and gained national prominence by prompt and decisive measures in meeting and overcoming a general strike in February, 1919. He wrote *Americanism versus Bolshevism* (1920).

**HANUM** (HANIM), HALIDÉ EDIB. See HALIDÉ EDIB.

**HAPGOOD**, NORMAN (1868- ). An American editor and critic (see VOL. X). He was editor of *Harper's Weekly* (1913-16), and Minister from the United States to Denmark from February to December, 1919. He was editor of *Hearst's International Magazine*, 1923-25. He published *The Advancing Hour* (1920), and collaborated with Henry Moskowitz in *Up from the City Streets*, a biography of Alfred E. Smith of New York (1927).

**HARA**, TAKASHI (1854-1921). A Japanese prime minister. He served as an official in the Foreign Office at home and abroad, attaining the rank of vice minister in 1895. In 1900, he was one of the organizers, with the late Prince Ito, of the Seiyu-kai Party and soon afterward was made Minister of Communications. He held that portfolio again in the Seiyu-kai ministry of 1906-08, was Minister of Home Affairs in 1915, and in 1918 became Premier. As Prime Minister, he practically dominated the government, and, in general, was opposed to the too rapid absorption of European ideas. Other features of his policy were the more complete coöperation between the military and other branches of government service and a spirit of conciliation in foreign affairs. Many attempts were made to overthrow his cabinet, the opposition attacking it for its policy toward China in the matter of the "21 Demands" and for its Siberian policy, demanding that the Japanese troops be withdrawn. Negotiations with China over Shantung and the policy of the conference at Darien, in which Japan had hoped to come to an agreement with the Far Eastern Republic of China, tended to sharpen the hostility between the political parties. His assassination, which occurred at Tokyo, Nov. 4, 1921, was just at the time when the Japanese delegation was gathering for the Washington Conference. See JAPAN, under *History*.

**HARAHAN**, WILLIAM JOHNSON (1867- ). An American railway official born in Nashville, Tenn., and educated at St. John's

College, New Orleans. After holding several important positions, he was appointed chief engineer of the Illinois Central Railroad in 1902. He became general manager in 1904 and in 1907 was appointed assistant to the president of the Erie Railroad. He was vice president of that road in 1911-12 and in 1912-18, was president of the Seaboard Air Line, of which he was also Federal manager (1918-20). He was a member of the United States Railway Board of Adjustment and became president of the Cincinnati and Ohio Railway and the Hocking Valley Railway in 1920.

**HARBEN, WILLIAM NATHANIEL** (1858-1919). An American story-writer (see Vol. X). His last three publications were *The Inner Law* (1915); *Second Choice* (1916); and *The Triumph* (1917).

**HARBORD, JAMES GUTHRIE** (1866- ). An American army officer, born at Bloomington, Ill., and graduated from the Kansas State Agricultural College at Manhattan, Kan., in 1886 and from the Infantry and Cavalry School in 1895. He joined the 4th Infantry as a private in 1889, and reached the rank of colonel (1903), brigadier general (1918), and major general (1919). He served in the Philippines (1903-14), was chief of staff in the American Army in France (1917-18), and commanded the Marine Brigade near Château-Thierry during June and July, 1918. He also served at Soissons, and commanded the Service of Supply during 1918-19. He was chief of the American Military Commission to Armenia in 1919. In 1921-22 he served as deputy chief of staff, U. S. Army, and in December, 1922, was retired, becoming president of the Radio Corporation of America. He wrote *Leaves from a War Diary* (1925). The Distinguished Service Medal for both Army and Navy and numerous foreign decorations were bestowed upon him.

**HARDEN, HÄRDÉN, MAXIMILIAN** (ISIDORE WITTKOVSKY) (1861-1927). A German journalist and author (see Vol. X). During the World War, he was probably the most outspoken critic in Germany of the German government and its policies, his attacks appearing in his newspaper, *Die Zukunft*. He was put in jail at various times, but no physical harm came to him till 1922, when an attempt was made to assassinate him. He was twice suggested for the post of Ambassador to the United States, once in 1919, and again in 1921. His early war book, *Krieg und Frieden* (1918), was followed by *Deutschland Frankreich England* (1923, English ed., 1924), and a selection from his *Köpfe*. Studies of contemporaries published from 1910 to 1924 appeared in English under the title *I Meet My Contemporaries* (1925). Another war book, *Von Versailles zu Versailles*, appeared in 1927.

**HARDING, WARREN GAMALIEL** (1805-1923). The 29th President of the United States, elected in November, 1920. He was born at Corsica, Morrow Co., Ohio, Nov. 2, 1865, and studied at the Ohio Central University. Entering the newspaper business, he became editor and publisher of the *Marion (Ohio) Star*. He ran for the office of Governor of Ohio in 1910, but was defeated. In 1914 he was elected a Republican member of the United States Senate for the term of 1915-21. He nominated Mr. Taft in 1912 and was chairman of the Republican Convention in 1916, making the keynote speech. In politics, he belonged to the

"stand-pat" element which was bitterly opposed to the insurgents led by Roosevelt. He was a strong supporter of President Wilson's war policies during the conflict, but in the treaty fight, he stood with Senator Lodge and signed the famous "round-robin" disapproving the linking of the League of Nations with the Peace Treaty. He voted for the submission of the Prohibition and Woman Suffrage Amendments, and in general supported the policies of the majority of his party. In 1920 through the efforts of his friend, Harry M. Daugherty, afterward Attorney General, he was put forward prominently as a candidate for the Presidency. At the convention, he was nominated on the 10th ballot, receiving 692½ votes. His selection was somewhat of a surprise to the people at large. The most difficult question before the Republican candidate was that of the League of Nations. A strong element in the Republican Party was bitter against any form of participation, whereas a smaller but more influential body, represented by such men as Mr. Hughes, Mr. Hoover, and Mr. Root, favored some sort of co-operation. Mr. Harding put forward the idea of an association of nations to which the United States would belong but reserving the right of independent action, and he also favored an international court of justice. During the two years before his death, signs of revolt against the Republican organization were evident, and in 1922 the Republican majority in the House was greatly reduced in the Congressional elections. An agricultural bloc was formed in Congress as a result of the dissatisfaction of the farmers, especially those in the West. Shortly before President Harding's death, Shipstead and Magnus Johnson were elected to the Senate and a third party movement was threatened. The conspicuous features of the latter days of his administration were his advocacy of the Permanent Court of International Justice, which was sharply attacked by Senators Johnson, Borah, and others, and the opening of the Senate investigation into the Teapot Dome (Wyo.) and Elk Hills (Calif.) oil leases, which led to the prosecution of former Secretary of the Interior Albert B. Fall, and the lessees, Edward L. Doheny and Harry F. Sinclair. President Harding died at San Francisco, Calif., on Aug. 2, 1923, on his return trip from Alaska.

**HARDING, WILLIAM P. G(OULD)** (1864- ). An American banker born in Greene County, Ala. After graduating from the University of Alabama, he entered the bank of J. H. Fitts and Company at Tuscaloosa, from there went to the Berney National Bank at Birmingham, Ala., and from 1902 to 1914 was president of the First National Bank of Birmingham. He was a member, 1914-22, and governor, 1916-22, of the Federal Reserve Board at Washington, and has been closely associated with financial transactions of the United States Government. Since Jan. 1, 1923, he has been governor of the Federal Reserve Bank of Boston. He was managing director of the War Finance Corporation in 1918-19. He wrote *The Formative Period of the Federal Reserve System* (1925).

**HARDINGE, HÄRDING, OF PENSURST, CHARLES, FIRST BARON** (1858- ). A British diplomat and public official (see Vol. X). He was again Permanent Under-Secretary of State for Foreign Affairs from 1916 to 1920, when he became Ambassador in Paris, serving there until 1922.

**HARDY, THOMAS** (1840-1928). An English novelist (see VOL. X), holder of the gold medal of the Royal Society of Literature. *The Dynasts* was produced in London early in the World War, and again in 1920. His later works were *Selected Poems* (1916); *Moments of Vision* (poetry, 1917); complete *Poetical Works* (2 vols., 1919, 2nd ed., 1923); *Late Lyrics* (1922); *The Queen of Cornwall* (drama, 1923); *Human Shows, Far Fantasies, and Songs, and Trifles* (poetry, 1925); *Winter Words in Various Moods and Metres*, last poems which Hardy planned to publish on his 1928 birthday (1928); and *Old Mrs. Chundle* (1928). Consult *The Technique of Thomas Hardy*, by J. W. Beach (1922); *Thomas Hardy's Universe*, by E. Brennecke (1924); *The Life of Thomas Hardy*, by his wife, Florence Emily Hardy (2 vols. vol. 1. 1928); *Essay on Hardy*, by H. H. Tomlinson (1928); *The Landscape of Thomas Hardy*, by Donald Maxwell (1928); and *Giant and Pygmy*, an appreciation in verse by Hibbert Gilson (1928).

**HARE, HOBART AMORY** (1862- ). An American physician, born in Philadelphia (see VOL. X). He resigned as editor of the *Therapeutic Gazette* in 1927. His book, *Practical Therapeutics*, published in 1890, reached its 20th edition in 1927.

**HARKINS, WILLIAM DRAPER** (1873- ). An American university professor and chemist, born at Titusville, Pa. He was graduated from Stanford University in 1900, after which he studied at the University of Chicago, Massachusetts Institute of Technology, and at Karlsruhe, Germany. He was instructor of chemistry at Stanford University in 1898, and in 1900-12, head of the department of chemistry in the University of Montana. He was chemist in charge of the Anaconda Farmers' Association's investigation of smelter smoke from 1902 to 1910, and did research work for the Carnegie Institution of Washington in 1911. Appointed assistant professor of chemistry at the University of Chicago in 1912, he became professor of physical chemistry there in 1917. He gave many lectures on industrial research, was editor of the section on general and physical chemistry of *Chemical Abstracts*, and wrote many technical papers giving the results of original researches.

**HARMSWORTH, ALFRED CHARLES WILLIAM**. FIRST VISCOUNT HARMSWORTH. See NORTHCLIFFE, ALFRED CHARLES WILLIAM HARMSWORTH, FIRST VISCOUNT.

**HARRIES, GEORGE HERBERT** (1860- ). An American general, born at Haverfordwest, in Wales. In 1895-96, he was president of the Metropolitan Railroad Company of Washington, and from 1897 to 1915, commanded the military and naval militia of the District of Columbia. During the Spanish-American War he was colonel of the 1st District of Columbia Infantry, United States Volunteers. In the World War, he served as a brigadier general, U. S. Army, with the A. E. F. He acted as chief of the United States Military Mission at Berlin, Germany, in 1918-19, and was appointed brigadier general of the Officers' Reserve Corps in 1920, and major general in 1924. He was national commander-in-chief of the Military Order of the World War, 1920-25.

**HARRIS, CORRA MAY** (MRS. L. H. HARRIS) (1869- ). An American author (see VOL. X). Her later books include: *The Co-Citizens* (1915); *A Circuit Rider's Widow* (1916); *Making Her His Wife* (1918); *From Sunup to Sun-*

*down* (1919); *Happily Married* (1920); *My Son* (1921); *The Eyes of Love* (1922); *A Daughter of Adam* (1923); *My Book and Heart* (1924); *As a Woman Thinks* (1925); *Flapper Anne* (1925); *Happy Pilgrimage* (1927).

**HARRIS, FRANK** (1856- ). An English author and editor (see VOL. X), who was editor of *Vanity Fair*. Among his later works were *The Yellow Ticket, and Other Stories* (1914); *Oscar Wilde, His Life and Confessions* (1916); *Contemporary Portraits* (1915, 1919, 1920, 1923); *Undreamed of Shores* (1924); *My Life* (1926); *Joan la Romée* (drama, 1926); and *Latest Contemporary Portraits* (1927).

**HARRIS, J (AMES) ARTHUR** (1880- ). An American botanist and statistician, born at Plantsville, Ohio. He was educated at the University of Kansas and Washington University (Ph.D., 1903). He was assistant in botany (1901-03) at the Missouri Botanical Garden; instructor (1903-07) at Washington University; and botanical investigator at the Station for Experimental Evolution, Carnegie Institution (1907-24). Since 1924 he has been head of the department of botany at the University of Minnesota. He was awarded the Welden Medal and Memorial Prize by Oxford University in 1921. His published work was mainly in biometry.

**HARRIS, WILLIAM LAUREL** (1870-1924). An American mural painter (see VOL. X). His later works included the mural painting and decoration in the Paulist Church, St. Bartholomew's Church, and the Corpus Christi Chapel, all in New York City.

**HARRISON, FRANCIS BURTON**. See PHILIPPINES.

**HARRISON, FREDERIC** (1831-1923). The leader of the English Positivists, and a man of letters (see VOL. X). During the World War, he was active in the anti-German propaganda, having been a constant critic of British indifference to the German military activities. Among his later works may be mentioned: *The German Peril* (1915); *On Society* (1918); *Jurisprudence and Conflict of Nations* (1919); *Obiter Scripta* (1919); *Novissima Verba* (1920).

**HARRISON, HENRY SYDNOR** (1880- ). An American novelist (see VOL. X). His later works include *Angela's Business* (1915); *When I Come Back* (1919); *Saint Teresa* (1922); and *Andrew Bride, of Paris* (1925).

**HARRISON, LELAND** (1883- ). An American diplomat and State Department official. He was born in New York City and graduated at Harvard (1907). For a year, he served as private secretary to the American Ambassador to Japan. He was then secretary of embassies and legations at Tokyo, Peking, London, and Bogota (1908-15), and in 1915 was assigned to duty in the Department of State at Washington. He was diplomatic secretary of the American Commission to Negotiate Peace at the end of the World War. In 1920 he was counselor to the American Embassy in Paris, but in the following year returned to the State Department on special duty and served as expert assistant to the American commissioners at the Conference on Limitation of Armament in 1921-22. From 1922 to 1927, he was Assistant Secretary of State. In February, 1927, he was appointed Minister to Sweden and in September, 1929, was named as Minister to Uruguay.

**HARRISON, PAT** (BYRON PATTON) (1881- ). A United States Senator, born at Crystal Springs, Mass., and educated at the Louisi-



ana State University at Baton Rouge, La. He began law practice at Leakesville, Miss., in 1902 and later removed to Gulfport in the same State. He represented the Sixth District of Mississippi in Congress for four terms (1911-19), and was elected United States Senator for two terms (1919-31). In 1924 he made the keynote speech at the Democratic National Convention. He was a member of the Senate Finance Committee and opposed the tariff legislation of 1929.

**HARSHBERGER, JOHN WILLIAM** (1869-1929). An American botanist (see Vol. X). He was professor of botany at the University of Pennsylvania (1911-29), and from 1913 to 1921 was in charge of ecology at the Marine Biological Laboratory, Cold Spring Harbor, L. I. He was a president of the Philadelphia Natural History, and a vice president of the Ecological Society of America. Included among his later books are *Vegetation of South Florida* (1914); *The Vegetation of the New Jersey Pine Barrens* (1916); *Pastoral and Agricultural Botany* (1920).

**HART, ALBERT BUSHNELL** (1854- ). An American historian (see Vol. X). Among his later works are *Monroe Doctrine* (1915); *New American History* (1917); *School History of the United States* (1917); *America at War* (1917); *Causes of the War* (1920); *We and Our History* (1923); *Wall Maps of American Government* (1927). In addition, he edited *American Patriots and Statesmen* (1916); *American Year Book* (1911-20, 1926-27); *Commonwealth History of Massachusetts* (1927-28); *Epochs of American History* (4 vols., 1891-1926); *American History Told By Contemporaries* (5 vols., 1898-1928); *American Citizen Series* (7 vols., 1899- ); *Source Readers in American History* (5 vols., 1901-27); *The American Nation* (28 vols., 1903-18).

**HART, HASTINGS HORNELL** (1851- ). An American social worker, born at Brookfield, Ohio, and educated at Oberlin College and Andover Theological Seminary. He was ordained to the Congregational ministry in 1880. After 1883, when he became secretary of the Minnesota State Board of Corrections and Charities, he was identified with social work, later in the Illinois Children's Home and Aid Society, and the Russell Sage Foundation, in which he was director of the department of child-helping (1908-24), and consultant in delinquency and penology after 1924. Among his numerous works are *Preventive Treatment of Neglected Children* (1910); *A Social Welfare Programme for the State of Florida* (1918); *How to Give Wisely* \$25,000 to \$1,000,000 (1921); *The Third Degree: Methods of Obtaining Confessions and Information from Persons Accused of Crime* (1921); *Employment for Jail Prisoners in Wisconsin* (1922); *A Study of the Penitentiaries of Pennsylvania* (1923); and an important study on *County Jails* (1925).

**HART, WILLIAM S.** (1870- ). An American motion-picture actor born in Newburgh, N. Y. He began his work in motion pictures in 1914 after having acted on the legitimate stage for many years. He has appeared chiefly in Western pictures, among his best being: *O'Malley of the Mounted and Travelin' On*. His most recent pictures are *Wild Bill Hickok*; *Singer Jim McKee*; *A Lighter of Flames*. In 1920 it was stated that Hart had appeared in 27 picture plays, bringing to producers and exhibitors a return estimated at nearly \$10,000,000.

**HARTFORD.** The capital of Connecticut. The population rose from 98,915 in 1910 to 138,036 in 1920 and to 172,300 in 1928, by estimate of the Bureau of the Census. The area is 18 square miles. Hartford is the leading insurance centre of the United States, more than 40 companies being controlled from Hartford offices. The assets of the Hartford insurance companies increased from \$462,160,129 in 1915 to \$1,693,519,555 in 1927, and during this period, they paid \$2,241,865,124 to policyholders and beneficiaries. Their premium income in 1927 was \$569,712,171. These companies employ approximately 16,000 persons, who are paid \$22,000,000 in salaries annually. Hartford has 337 industrial establishments employing 30,000 persons and paying \$32,850,000 in wages annually. Among the products manufactured are electrical equipment, automobile accessories, airplane motors, automatic machines, and pipe organs. In 1927 the value of these products was \$113,674,982. Several large commercial and civic buildings have been constructed recently, among them being Travelers' Tower, 527 feet high and the tallest structure in New England. The Horace Bushnell Memorial Auditorium is under construction, and a county court house, costing \$1,500,000, has been erected. Hartford has 25 elementary schools, 3 high schools, 1 trade school, and 9 parochial schools (including elementary and high schools); the appropriation for education in 1928 was \$3,320,531. Brainard Field, the municipal airport located on the Connecticut River, was opened in 1921. In 1928 it contained 165 acres, and an appropriation was passed which provided that the acreage be doubled. A \$1,000,000 bond issue also was voted to reclaim 1200 acres of land and provide a dike so as to keep the field dry in all seasons. Hartford has 10 State trust companies, 3 National banks, and 4 mutual savings banks, whose total resources in 1927 amounted to \$293,901,540. Bank clearings rose from \$261,404,106 in 1914 to \$832,271,076 in 1927 and deposits in discount banks from about \$46,000,000 to \$117,490,000; savings deposits increased from \$419.06 per capita in 1915 to \$720.92 per capita in 1928. The assessed valuation of property in Hartford in 1927 was \$338,789,000; the net debt was \$16,076,000.

**HARTS, WILLIAM WRIGHT** (1866- ). An American army officer, born at Springfield, Ill., and graduated at the United States Military Academy. He had a long and varied career in the Engineers Corps, and was made a brigadier general in 1924. President Wilson appointed him military aide in charge of public buildings and grounds, with rank of colonel, from 1913 to 1917. He built the Lincoln Memorial, the Arlington Memorial, and the Red Cross Building. In 1917 he went to France with his regiment. He was chief of the American Mission at the British headquarters in 1918, and chief of staff, Army of Occupation in Germany, during 1919-20, and from July, 1922, to March, 1923. He commanded the artillery forces at the Panama Canal, 1924-26, and was military attaché of the American Embassy at Paris after 1926.

**HARTY, SIR HAMILTON** (1879- ). A noted British conductor and composer, born at Hillsborough, Ireland. He received his entire musical education from his father, an excellent organist. After filling positions as organist in Belfast and Dublin, he settled, in 1900, in London, where he soon became known as an excellent

accompanist and appeared on several occasions as conductor of the London Symphony Orchestra and with the British National Opera Company. In 1920 he was appointed regular conductor of the Hallé Orchestra in Manchester. He was knighted in 1925. His compositions include the choral works with orchestra, *Ode to a Nightingale* and *The Mystic Trumpeter*; *Irish Symphony*; *Comedy Overture*; two symphonic poems, *A Tinker's Wedding* and *With the Wild Geese*; a violin concerto in D minor; *Phantasy Scenes* for orchestra; and chamber music.

**HARVARD UNIVERSITY.** A nonsectarian, endowed, educational institution at Cambridge, Mass., founded in 1636. Many changes were made in the methods of teaching, as well as in the requirements for admission and graduation, after 1914. Important additions were made to the library and the several museums. Various schools were reorganized and several new ones were established. Many new buildings were completed. Partly by means of an endowment-fund campaign, begun in 1917 but postponed because of the War until 1919, and partly through gift, the productive funds of the university were increased so that by 1928 the total reached \$86,702,875, in which year income totaled \$11,639,715. The teaching staff increased in number from about 800 in 1914 to 1311 in 1927-28 and in the same period the students increased in numbers from 4266 to 8110. In 1922 there was inaugurated a system of alumni voting by postcard ballot for the overseers, who form one of the two governing boards of the university.

Among the important changes in Harvard College was the adoption of a method of selective admission, instituted as an experiment in 1923, whereby pupils having satisfactorily completed an approved school course and ranking scholastically among the highest seventh of their graduating class, may, on the recommendation of their school, be admitted without examination. All seniors in Harvard College, except those specializing in mathematics or the natural sciences, were required to pass general examinations in the field of concentration, not only covering the courses taken by the individual, but outside reading as well; an extension of a policy successfully practiced for a number of years in other divisions, having been instituted in the division of history, government, and economics in 1916. The plan included the increased use of the tutorial system.

The Engineering School as such, awarding the degree of S.B. after four years of undergraduate study, as well as higher degrees, was reorganized in 1918, although the teaching of engineering at Harvard dates back to 1847 with the founding of the Lawrence Scientific School. In 1920 new methods of instruction were adopted, the students training partly in the laboratories and classrooms and partly in the neighboring industrial and engineering concerns. In the same year, it joined with the Graduate School of Business Administration in laying out a five-year programme of study in business engineering.

Three other schools were established between 1914 and 1928. The Graduate School of Education, for both men and women, was founded in 1920, partly through the assistance of the General Education Board, and largely through money obtained in the endowment fund campaign. This was a school for the professional training of teachers, principals, and school super-

intendents, and for research in educational problems. In 1922, pursuant to an agreement between the Harvard Divinity School and the Andover Theological Seminary, the Harvard Theological School, nondenominational in policy, was organized, with the Rev. Willard L. Sperry as Dean. The School of Public Health, closely allied with the Medical School, was established also in 1922, with a gift of \$20,000,000 from the Rockefeller Foundation, its dean being Dr. David L. Edsall, dean also of the Medical School. The Dental School raised its standard of admission in 1921, by establishing as a prerequisite for enrollment, at least one year of college work. In the Graduate School of Business Administration, instruction by the case system, such as was used in the Harvard Law School, was extended greatly. Exchange of professors with European institutions and with Western colleges was continued and in 1923 the exchange of tutors with English universities was inaugurated.

Many physical changes were made in and about the university. The Harry Elkins Widener Memorial Library was dedicated in 1915, as was the Cruft Memorial Laboratory for high-frequency electrical work. In 1915 the rebuilding of the Gray Herbarium was completed, and the Dudley Memorial Gate and Clock Tower was erected. Three Freshman halls, Standish, Gore, and Smith, were occupied in 1914 for the first time, and two new dormitories were dedicated in 1927, one erected in memory of Isidor Straus and the other in memory of George Alexander McKinlock, Jr., of the Class of 1916. Other buildings completed since 1914 include the Germanic Museum, the Music Building, containing the John Knowles Paine Concert Hall, the Dunbar Laboratory for research in cryogenic engineering, the Crimson Building to house the undergraduate daily paper and the alumni weekly, the McKay Engineering Laboratory, the new Fogg Art Museum, dormitories, laboratories and lecture and class rooms of the graduate school of business administration, the gift of George F. Baker, a footbridge across the Charles River, named in honor of John W. Weeks, former Secretary of War, new chemical laboratories, and a medical school dormitory.

By gift of Edward S. Harkness, of New York City, and a Yale graduate, Harvard acquired in 1928 the sum of \$3,000,000 for the erection of several houses by means of which the college will be subdivided into social and residential units. Early in 1929, this gift was supplemented by an additional sum, from the same donor for the same purpose, of \$10,000,000. According to announcement, the subdivision will begin with the construction of two houses, others to be added later, in part from existing dormitories. Each house will contain about 250 students who will, as far as possible, represent a cross-section of the entire college as regards subjects of concentration, finances, and geographical distribution. The innovation contemplated no change in the methods of teaching, responsibility remaining wholly under the direction of the Faculty of Arts and Sciences. The plan was expected to give an additional stimulus to scholarship and intellectual interest, but otherwise was not an educational but a social change. The plan will make possible more personal attention to the individual student. President, A. Lawrence Lowell, LL.D.

**HARVEY, GEORGE (BRENTON McCLELLAN)** (1864-1928). An American editor, publisher,

and diplomat (see VOL. X). From 1900 to 1915, he was president of Harper & Brothers, publishers, and during 1899-1921 and 1924-26 was editor of the *North American Review*. He was for many years one of the strongest supporters of Woodrow Wilson, urging his election as Governor of New Jersey, and later as President, in *Harper's Weekly*. Rumors that the weekly was supported by a special financial group, and that its campaign on his behalf was harming his cause in the West, led to a request from Mr. Wilson that Colonel Harvey withdraw his support, and eventually to a break between the two men. Colonel Harvey was one of the bitterest opponents of the entry of the United States into the League of Nations, thus further antagonizing Mr. Wilson. In 1920 the editor was a supporter of Warren G. Harding for the presidential nomination and election, making use for that purpose of a publication which he had founded, *Harvey's Weekly*. Mr. Harding appointed him Ambassador to the Court of St. James's. Three months after the death of President Harding, he resigned his ambassadorship (December, 1923). Upon his return to America, he edited the *Washington Post* for a year. In 1926 he relinquished his post as editor of the *North American Review*, and subsequently he devoted much of his time to writing a biography of Henry Clay Frick, published early in 1928. Colonel Harvey received the degree of LL.D. from the universities of Nevada and Vermont and from Middlebury and Erskine Colleges, and that of Litt.D. from Dartmouth College. Consult Willis Fletcher Johnson, *George Harvey* (1929).

**HASKELL, WILLIAM NAFEW** (1878- ). An American army officer, born at Albany, N. Y. He graduated from the United States Military Academy in 1901; from the Infantry and Cavalry School in 1904; and from the Army Staff College in 1905. He was made captain in 1916 and in 1917 was appointed major of field artillery in the National Army. He served throughout the World War, becoming lieutenant colonel in the Regular Army in 1920. In France, he served as assistant chief of staff with the 77th Division and participated in several important campaigns. Following the close of the War, he acted as head of the American Relief Commission to Rumania and was later director general of all relief in the Caucasus. In 1921-23 he served as chief of the American Relief Commission to Russia, and Red Cross Commissioner to Greece in charge of relief work incident to the Smyrna disaster. Returning to the United States he was commissioned major general in the New York National Guard in 1926.

**HASKINS, CHARLES HOMER** (1870- ). An American educator, born at Meadville, Pa. He graduated from Johns Hopkins University in 1887 and was instructor from 1889 to 1890. He served as instructor, professor of history, and professor of European history at the University of Wisconsin from 1892 to 1902. In the latter year, he joined the faculty of Harvard University as lecturer on history, becoming successively professor of history and Gurney professor of history and political science (1912). From 1908 to 1924, he served as dean of the Graduate School of Arts and Sciences, becoming a member of many foreign and American learned societies. In 1918-19 he was a member of the American Commission to Negotiate Peace, serving on the special committee on Alsace-Lorraine and the Saar Valley, and was also on several other com-

missions in Europe. From 1920 to 1926, he was chairman of the American Council of Learned Societies. He was the author of *The Normans in European History* (1915); *Norman Institutions* (1918); *Some Problems of the Peace Conference* (with R. H. Lord, 1920); *The Rise of Universities* (1923); *Studies in the History of Medieval Science* (1924); and *The Renaissance of the Twelfth Century* (1927). He was also editor of the *American Historical Series*.

**HASSALL, ARTHUR** (1853- ). An English historian (see VOL. X). In 1918 he wrote *France, Medieval and Modern*; in 1919, *A Handbook of British History*; in 1920, *British History* (chronologically arranged, 55 B.C.-A.D. 1919), and *European History* (chronologically arranged 476-1920), the latter being an enlarged edition of an old work.

**HASSAM, CHILDE** (1859- ). An American painter and etcher (see VOL. X). Especially interesting among his works during the decade were his flag pictures of Fifth Avenue, in which, with vitality and great effectiveness he caught the exultant spirit of flowing banners, as in "Allies Day." His etching was notable for its reticence and subtlety. Several important exhibitions of his drawings, etchings, and water colors were held in New York. Among his awards were the Altman Prize, National Academy of Design, 1918; the gold medal of honor, Pennsylvania Academy of Fine Arts, 1920; and the gold medal of the Sesquicentennial Exposition, 1926. In 1919 he became a member of the American Academy of Arts and Letters.

**HASTINGS, JAMES** (1852-1922). A Scottish editor and Biblical scholar (see VOL. X), who received the Dyke-Aland Medal in 1913. Besides continuing to edit the series of dictionaries and encyclopædias begun some years ago, he started another series, *Great Christian Doctrines*, of which there appeared: vol. i, *Prayer* (1915); vol. ii, *Faith* (1919); vol. iii, *Peace* (1921); and *The Children's Great Texts of the Bible* (1920-21).

**HASTINGS, THOMAS** (1860-1929). An American architect (see VOL. X), member of the firm of Carrère & Hastings. He was a member of the National Academy of Design and the American Academy of Arts and Letters, and was president of the Society of Beaux Arts Architects. In 1924 a design made by him for the war memorial for New York City was accepted.

**HATCH, WILLIAM HENRY PAINE** (1875- ). An American theologian, born in Camden, N. J. He was graduated from Harvard in 1898 (Ph.D., 1904), and at the Episcopal Theological Seminary, Cambridge, Mass., and the General Theological Seminary, New York City. After ordination to the Protestant Episcopal ministry in 1902, he held charges in Cambridge, Mass. (1902-03), Lake George, N. Y. (1904-05), and Lexington, Mass. (1905-08). In 1909 he went to the General Theological Seminary, becoming professor of the language and literature of the New Testament there (1913-17) and in the Episcopal Theological Seminary in Cambridge (1917- ). He was annual professor at the American School of Oriental Research in Jerusalem, 1922-23. Dr. Hatch has published many articles and reviews and is the author of *The Pauline Idea of Faith* (1917) and *The Idea of Faith in Christian Literature from the Death of St. Paul to the Close of the Second Century* (1925).

**HAUK, MINNIE** (1852-1929). An American soprano (see VOL. X). In the fall of 1912, a

false report of her death was circulated in all the musical journals of the English-speaking world. The fact that this report was unfounded did not become known until in December, 1919, some friends issued a general appeal for assistance, as the artist had become destitute through the World War and was almost totally blind. The appeal met with a generous response. In 1923 it was reported that a successful operation had brought about an improvement in her sight. She died in Lucerne, Switzerland, Feb. 6, 1929.

**HAUPTMANN**, haupt'màn, GERHART (1862- ). A German poet, dramatist, and novelist (see VOL. X). At the outbreak of the World War, he had a controversy with Romain Rolland, who had challenged him to protest against the crime of Louvain. Later, he engaged in welfare work and was particularly active in caring for the wounded during the revolution in Berlin in 1919. His later writings comprise: *Der Bogen des Odysseus* (1914); *Parsival* (1915); *Der Ketzer von Soana* (1918); *Indipohdi* (1920); *Der weisse Heiland*, a dramatic phantasy (1920); *Anna*, a rural epic (1921); *Peter Brauer* (1921); *Phantom*, memoirs of a convict (1922); *Kaiser Maxens Brautfahrt* (1924); *Ausblicke*, a volume of essays (1924); *Die Insel der grossen Mutter*, a novel (1924); the tragicomedy, *Veland*, and the drama *Dorothea Angermann* (1926); *Till Eulenspiegel* (1927); and the novel, *Wanda* (1928). An earlier romantic drama, *The Sunken Bell*, was used by the Italian composer, Respighi, as libretto of an opera, presented at the Metropolitan Opera House in New York in 1928. English translations of his works appeared in London and New York, among them *Dramatic Works of Gerhart Hauptmann*, vol. xix, in 1928.

**HAUSER, HENRI** (1866- ). A French historian and economist who was born at Orân, Algeria, and educated at the École Normale Supérieure and passed through the academic hierarchy until he became professor on the faculty of letters in the Sorbonne. For the year 1922-23, he was the French visiting professor at Harvard University, lecturing on the history of capitalism.

An authority on the economic history of the latter Middle Ages and the Renaissance, Professor Hauser wrote illuminatingly on social conditions both of the past and present.

His works include *François de la Noue* (1893); *Ouvriers des temps passés; XVe-XVIIe siècles* (1898); *L'Or* (1901); *L'Impérialisme américain* (1905); *Les Sources de l'Histoire de France au XVIe Siècle* (4 vols., 1906-15); *Études sur la réforme française* (1909); *La France et ses colonies* (1912); *Le Traité de Madrid et la cession de la Bourgogne* (1912); *La Guerre Européenne et le problème colonial* (1915); *Economic Germany* (Eng. trans., 1915); *Germany's Commercial Grip Upon the World* (Eng. trans., 1917); *Les Routes fluviales de l'Europe nouvelle* (1918); *Travailleurs et marchands dans l'ancienne France* (1920); *Propos d'un ignorant sur l'économie nationale* (1923); *La Nouvelle orientation économique* (1924); *L'Amérique vivante* (1924); *Les problèmes du régionalisme* (1924); *Histoire de la période 1560 à 1661* (1925); and *Les débuts du capitalisme* (1927).

**HAUSER, houz'ér, OTTO** (1876- ). An Austrian writer, who was born at Dianesch, Croatia, and studied at the University of Vienna. He is the author of *Weltgeschichte der Literatur*

(1910); *Rassebücher, Rasse und Rassefragen* (1913); *Geschichte des Judentums* (1921); and other works of a critical and historical character. He translated Verlaine, Rossetti, Swinburne, Wilde, Van Eeden, and others, prefacing the translations by illuminating essays. He compiled anthologies of Chinese, Japanese, and Scandinavian poetry with appropriate appreciations, and he has published his own works which include: *Spinoza* (1908); *Alt Wien* (1910); *Der liebe Augustin* (1913); *Das Deutsche Herz* (1921); and *Atlantis* (1921). Among his later works are *Biblische Sonnette*, poems (1922); *Das Licht der Welt*, poems (1922); *Das Nibelungenlied* (1923); *Rasse und Kultur* (1924); and *Der germanische Glaube* (1926).

**HAUSMANN, hous'màn, ERICH** (1866- ). A German-American physicist, born in Solinger, Germany. He was graduated at the Brooklyn Polytechnic Institute in 1908, then studied at New York University. Returning to the Polytechnic Institute, he taught physics and electrical engineering, becoming professor of physics in 1918. In addition, he was a member of the graduate faculty at New York University during 1911-16. He specialized on methods of electrical communication, transmission, and traction, and on wave propagation along conductors. Dr. Hausmann has been very active in the Brooklyn Institute of Arts and Sciences, serving as vice president of its department of electricity (1909-21), and later as president. He is the author of *Electric Wave Propagation and Distribution along Conductors* (1911); *Telegraph Engineering* (1915); *Dynamo Electric Machinery* (1922); and, with others, of *Alternating Current Machines* (1908); *Direct Current Machines* (1909); *Electric Traction and Transmission Engineering* (1912); and *Physics Laboratory Experiments* (1917).

**HAVERFORD COLLEGE.** An institution under the control of the Society of Friends, at Haverford, Pa., founded in 1833. Haverford grew steadily during the years 1914-1929 with the exception of the War years, from an enrollment of 176 to 297; the faculty membership increased from 22 to 33; the library from 62,000 to 107,000 volumes; and the productive funds from \$1,100,000 to \$4,188,313. The Isaac Sharpless Science Hall for physics and biology was built in 1919, and the children of Gideon Scull gave \$140,000 in 1916 to establish a chair in English Constitutional History. William Wistar Comfort, Ph.D., LL.D., succeeded Isaac Sharpless, LL.D., as president in 1917.

**HAVRE, hä'vër; Fr. LE HAVRE, lê à'vr.** The second largest seaport of France, capital of an arrondissement of the same name in the department of Seine-Inférieure, on the estuary of the Seine, and 228 kilometers (141.6 miles) from Paris. The population in 1926 was 158,022. Havre is an important cotton market, four-fifths of France's cotton supply entering through this port. It is also a leading coffee mart. Other imports are brass, wool, and tea. The manufactures include rope, wire, dyes, cloth, and flour. Since 1926 Havre has entered upon a vast programme of port extension and the construction of quays and basins upon ground reclaimed from the Seine. Among these improvements are the building of a breakwater on the sea side of the old breakwater of Saint-Jean and of a dyke approximately 1000 meters (3280 feet) long at the mouth of the Seine to the east, so as to form a new outer harbor and a tidal basin

of approximately 200 hectares (494.2 acres). In October, 1927, a new drydock, 312 meters (1023.6 feet) long and 38 meters (124.6 feet) wide, was opened. The total length of docks devoted solely to regular shipping is 8000 feet, and the area of open spaces bordering them totals 225 acres. In 1929 an ocean quay, 2000 feet long and with a depth of water in the berths of 48 feet, was under construction. The buildings used for the storage of cotton cover 90,000 square yards. Havre also has five public warehouses, covering an area of 550,000 square yards. The port is autonomous. During the World War, Havre was one of the great bases for the landing of British and American troops. The seat of the Belgian government after the fall of Antwerp and Ostend, was transferred to Sainte-Adresse, a suburb of Havre, the Parliament meeting at the Hôtel des Régates.

**HAWAIIAN ISLANDS**, or **HAWAII**. A territory of the United States, consisting of a group of islands in the north-central Pacific Ocean. Total area, 6440 square miles. The population of Hawaii increased from 191,909 in 1910 to 255,912 in 1920. The population on June 30, 1927, was estimated at 333,420. There is a great diversification of races among its population, and with the exception of the native Hawaiians, all are increasing. The Japanese form the largest proportion; they numbered 79,875 in 1910, and 109,274 in 1920. The Portuguese are second, with 22,301 in 1910 and 27,002 in 1920. The number of native Hawaiians decreased from 20,041 in 1910 to 23,723 in 1920. The other races forming the population, with their numbers, in 1910 and 1920, are as follows: Asiatic Hawaiian, 3734, 6955; Caucasian Hawaiian, 8722, 11,072; Porto Rican, 4890, 5602; Spanish, 1190, 2430, other Caucasian, 14,867 19,708; Chinese, 21,674, 23,507; Filipino, 2361, 21,031; Korean, 4533, 4950; Negro, 695,348; all other, 310, 376. In 1927 there were 12,296 births and 3029 deaths. The average rates for the five-year period, 1923 to 1927, were 39.2 and 13.4 per 1000 inhabitants, respectively.

**Agriculture.** The agricultural development of the Territory is under the Bureau of Agriculture and Forestry and the College of Hawaii. In addition to these, there are the Federal Experiment Station, which is assisted financially by the Territory, and the Hawaiian Sugar Planters' Association's Experiment Station, which meets the needs of the sugar industry. Up to July 1, 1915, the work of the Bureau was supported by a special income tax. Following that year, specific appropriations were made out of the general revenues. The United States Census of 1910 showed a total area of 305,053 acres of cultivated agricultural lands in the Territory. The maximum of the possible cultivable land is about 40,000 acres. Between the years 1910 and 1920, the number of farms in the Territory increased from 4320 to 5284. The land in farms increased from 2,590,600 acres in 1910 to 2,702,245 in 1920, while the improved land in farms increased from 305,053 acres in 1910 to 435,242 acres in 1920. The percentage of the total area in farms increased from 62.8 in 1910 to 65.5 in 1920. The value of farm property increased from \$96,363,229 in 1910 to \$151,129,085 in 1920, and the average value per farm increased from \$22,306 in 1910 to \$28,601 in 1920. The chief agricultural industry in the islands was the growing of sugar cane. The acreage under cultivation in 1909 was 186,230, and the

sugar cane was harvested in 1926 from 123,000 acres. The sugar yield of the cane crop has risen persistently, owing to improving methods of cultivation, although the cane acreage remains nearly stationary. The highest sugar tonnage up to 1924 was 645,000 tons in 1917; in 1926, 787,246 tons were produced; in 1927, 795,850. Rice is the most important cereal grown. The acreage, however, decreased after 1909. Production decreased from 41,827,900 pounds in 1909 to 29,571,845 pounds in 1919. The acreage planted to coffee increased from 3727 in 1909 to 5687 in 1919, while the production increased from 9,834,026 pounds in 1909 to 19,883,650 pounds in 1919. The growing and canning of pineapples has become the second largest industry. Its cannery output rose from 12,361,695 pounds in 1909 to 299,981,433 pounds in 1919. Canned-pineapple shipments for a year, 1926-27, were reported as 410,570,332 pounds; in value, \$35,403,305. Other fruits produced were avocados, bananas, figs, oranges, and papayas. The number of farm owners increased from 963 in 1910 to 1419 in 1920. The managers decreased from 249 in 1910 to 126 in 1920, and the tenants increased from 3108 in 1910 to 3739 in 1920. The white farmers increased from 753 in 1910 to 802 in 1920; the colored farmers from 3567 in 1910 to 4302 in 1920. The Department of Agriculture and Forestry and the Agricultural Experiment Station did work with excellent results, especially in the period from 1914. Largely through the efforts of the Agricultural Experiment Station, agriculture became more diversified. The Experiment Station was particularly successful in discovering and destroying plant pests which were destroying sugar cane and fruits. The Extension Division was established in 1914 and has developed numerous helpful points of contact with the various agricultural interests throughout the country. Owing to the effect of the mountains on the rainfall, most of the prime sugar cane land depends on irrigation. For this reason, forestry has been carried on in close alliance with agriculture, as a means of water conservation. Territorial forest reserves in 1927 aggregated 916,977 acres.

**Manufactures.** The chief industries of Hawaii were based largely on the production of sugar. The number of establishments decreased from 500 in 1909 to 496 in 1919. The wage earners, however, increased during the same period from 5904 to 9969. The capital invested was \$23,875,000 in 1909 and \$48,851,000 in 1919. The value of products increased from \$47,404,000 in 1909 to \$133,096,000 in 1919. There were 43 establishments in 1919 connected with the manufacture of sugar, compared with 46 in 1909. The value of the products of these increased from \$35,959,822 in 1909 to \$80,236,244 in 1919. In 1909 there were 74 establishments engaged in the cleaning and polishing of rice, as compared with 69 in 1919. The value of the product increased from \$2,238,607 in 1909 to \$5,436,455 in 1919. Ten establishments in 1909 were engaged in canning and preserving, as compared with nine in 1919. The value of the product increased from \$1,591,073 in 1909 to \$18,997,975 in 1919. These industries practically comprised the most important part of the manufacturing done in the Territory. Printing and publishing, cleaning and polishing coffee, the production of lumber, and the making of confectionery and ice cream were other manufacturing industries. Honolulu and Hilo are the chief manufacturing cities.



In Honolulu in 1909, there were 236 establishments and 241 in 1919. Hilo had no manufactures in 1909, but had 57 establishments in 1919. The value of the manufactures of Honolulu increased from \$10,704,744 in 1909 to \$43,611,175 in 1919. The industries of Hilo had a product valued at \$5,612,196 in 1919.

**Education.** The educational problems of Hawaii have been peculiarly difficult because of the mixture of populations and the Territory's comparatively rapid increase. There were 161 schools in 1913, and 25,631 pupils. The cost of maintenance was \$677,799. In 1925-26, there were 507 schools, and the enrolled pupils numbered 58,860, of whom 54,782 were in kindergarten or elementary, and 4078 in the secondary, grades. In 1914 there were 10,329 Japanese in the public schools. This number had increased in 1923 to 23,947. The Chinese increased from 2638 in 1914 to 4616 in 1923. The Hawaiians increased from 3288 in 1914 to 3565 in 1923. The Anglo-Saxons increased from 737 in 1914 to 1448 in 1923. Great attention has been given to the proper development of the educational system, especially with regard to agricultural and manual training. As part of this proceeding, there was a considerable reorganization and redirection of the public-school curriculum for the purpose of giving adequate recognition to branches. Junior high schools were established some years ago, and these became very popular among the people and greatly increased the interest in educational work wherever established. There were in 1927, 62,208 pupils in the public schools of the Territory, of whom 32,019 were male. The University of Hawaii, established in 1907, formerly the College of Hawaii, afforded opportunity for higher education. The enrollment increased from 144 in 1914 to 840 in 1927. The relations of the university and the community at large became much closer through the work of the extension department. Two industrial schools, one for boys and one for girls, also were maintained.

**Trade and Commerce.** The development of trade and commerce is indicated by annual totals covering several years. In 1914 the total of imports and exports amounted to \$77,144,329, of which \$41,594,072 represented exports and \$35,550,257, imports. In 1920 the total trade amounted to \$168,063,461, exports being \$104,779,804 and imports, \$63,283,647. In 1923 the total trade amounted to \$147,645,131, exports being \$72,768,317 and imports, \$64,876,814. In 1926 the total trade was \$200,342,000, of which exports amounted to \$111,504,000; imports, \$88,838,000. The exports to the United States in 1914 amounted to \$40,678,827 and the imports from the United States to \$29,267,699. In 1923 the exports to the United States amounted to \$116,956,090 and the imports from the United States to \$77,823,643. The total amount of raw sugar exported increased from 1,089,389,928 pounds, valued at \$32,108,518 in 1914, to 1,725,481,372 pounds, valued at \$70,177,023 in 1928. Fruits and nuts exported in 1914 were valued at \$5,061,525 and in 1928 at \$39,594,090, constituting, with sugar, the two largest groups of exports. Other important exports were coffee, rice, and hides. By far the largest trade was carried on with the United States, but there were important trade relations with Australia, British India, Canada, Japan, Chile, and the United Kingdom. The foreign imports consist chiefly of jutes from India, nitrates from Chile, silks from

Japan and China, native foodstuffs from Japan, and meat and butter from Australia and New Zealand. The exports to foreign countries are largely canned pineapples.

**Transportation.** The mileage of steam railroads in Hawaii increased from 307.43 in 1914 to 371.55 in 1927. There were steam railroads on all the islands operating on regular schedules, most of them carrying passengers. In addition, plantations possessed their private railway equipment for transporting cane and laborers. Passengers carried on all the railroads decreased from 1,958,548 in 1923 to 1,100,161 in 1927. The only street railway in the Territory is in Honolulu, where an electric line is operated. Traffic with the mainland is maintained by a number of steamship lines from New York and the west coast of the United States. In 1922 direct passenger and freight services were established between Los Angeles and Honolulu. Inter-island service was maintained by large and well-equipped steamboats.

**Banking.** The number of banks in the Territory increased from 19 in 1914 to 23 in 1927, while the individual deposits increased from \$10,371,874 in 1914 to \$79,214,000 in 1927. There were, in 1927, two National banks, a decrease from the five of 1914. One of these was at Honolulu and the other at Scofield. Their combined resources were \$9,223,000 in 1927; resources of all banks \$105,643,000.

**Finance.** The funded debt of Hawaii at the beginning of the fiscal year 1914-15 was \$6,844,000. This was increased, until on June 30, 1920, it amounted to \$10,894,000. Further increases brought the total on June 30, 1926, to \$22,070,000. A large part of this debt was incurred for public improvement and authorized by the Legislature in successive sessions since 1917. The increase in receipts and disbursements since 1914 will be noted by a comparison of the figures for several years of the period. In the fiscal year 1914-15, the total receipts amounted to \$4,905,149 and the disbursements to \$4,446,415. In 1923 the total receipts amounted to \$12,990,542 and the disbursements to \$11,533,819. In the year ended June 30, 1926, the receipts amounted to \$30,484,366 and the disbursements to \$26,311,921. The gross assessed value of real and personal property increased from \$161,187,226 in 1914 to \$414,064,603 in 1927. The taxes collected on real property increased from \$1,068,297 in 1914 to \$4,726,256 in 1923. The total of property and special tax receipts in the fiscal year 1926 was \$7,129,434.

**Health and Sanitation.** Nearly all the public-health work in the Territory was done by the Territorial Department of Public Health. The death rate per thousand in population decreased from 15.03 in 1914 to 11.87 for 1927. Campaigns for the eradication of rats and mosquitoes were carried on as sanitary measures. For many years, plague had been endemic in the Hamaqua district and the island of Hawaii, and the object in these areas was the destruction of rats which acted as carriers of the germs of the plague. In 1923 nearly 200,000 rats were destroyed. Several cases of plague occurred each year. Material progress was made in a sustained campaign against tuberculosis. Education and publicity work were carried on in the public press and lectures, and sanitarium were maintained for persons suffering from this disease. The Hawaiian race is especially susceptible to tuberculosis. Nearly one out of

every 100 persons of this race has the disease or traces of it. Institutions were maintained on the island of Molokai and other localities in the islands for the treatment of leprosy. The number of persons living segregated in the Molokai leper settlement in 1927 was 497. The installation of sewage systems in Hawaii and other localities resulted in a great improvement in the sanitary conditions. The United States Public Health Service rendered valuable aid in the decade, having general charge of the examination of vessels entering the ports. It also helped the Territorial Board of Health in its rat campaigns and other functions of that department.

**History.** A direct primary law, somewhat similar to the Berkeley system of double elections, was adopted by the Legislature of 1913 and elections were held under this law in 1915 and in the odd years thereafter. Sessions of the Legislature also are held biennially. The Legislature of 1915 passed much legislation of an advanced character. The laws relating to taxation were amended and ample provision was made for the encouragement of immigration in the Territory. In 1916 the Government created the Hawaii National Park, which was the first national park lying outside continental United States. In this park were included the three volcanoes, Kilauea, Mauna Loa, and Haleakala. With the entrance of the United States into the World War, Hawaii took on added importance as a naval station, and it became the largest military outpost of the United States. The National Guard was brought in numbers and plan of organization to the maximum that could be obtained under voluntary service. Four regiments and other units were organized. This organization policed the islands, thus relieving the Regular Army of this duty.

At the outbreak of the War, there were eight German merchant vessels and gunboats interned in the Port of Honolulu and several merchantmen in the Port of Hilo. These were seized by the United States Government and placed at once in commission. The Legislature in 1917 created a commission to conserve and regulate the food supply, revised banking laws, and made provision for the citizens absent in the Army and Navy. On July 1, 1918, the first and second regiments of Hawaiian Infantry were drafted into the national service. Owing to the greatest storm in the history of the Territory, a special session of the Legislature was held in this year and appropriations made to rebuild bridges and other public works destroyed by the storm. On Aug. 21, 1919, the Secretary of the Navy opened the new concrete drydock at Pearl Harbor on the island of Oahu. There was a serious strike on the sugar plantations in February, 1920, which lasted until June, when the laborers decided to return to work on the conditions that prevailed before the strike.

At the legislative session of 1921, an act was passed raising the limit of outstanding bonded indebtedness to \$16,500,000. A court of domestic relations was created and hours of child labor were regulated. A measure also was passed creating an emergency labor commission. The Legislature of 1923 authorized the preparation of a statement defining and emphasizing the status of the Territory, which was entitled "Hawaii's Bill of Rights." This statement was designed to emphasize the unique position held by Hawaii among the Territorial possessions, in

that it had always been a source of Federal revenue while it had been uniformly deprived of the benefits of the Federal appropriations. The Legislature of 1923 amended the election laws, revised the Territorial Tax Law, increased the bonded indebtedness, amended the Workmen's Compensation Act, and passed a uniform law on aeronautics. Conferences of Pacific leaders organized by the Pan-Pacific Union and held at Honolulu have met in various years since 1914.

A conference of scientists was held in 1920, a conference of educators in 1921, a conference of journalists in the same year, and a conference of commerce and finance in November, 1922. In addition, a conference on education was held in connection with the World Conference on Education which met in San Francisco in July, 1923. The United States Congress created the Hawaiian Homes Commission in 1920 to administer a project for rehabilitating the Hawaiian race; the Legislature of 1927 took steps to extend this work and obtain for it further Federal support. Lawrence M. Judd was appointed Governor of the Territory by President Hoover in 1929.

**HAWES, HARRY BARTOW** (1869- ). A United States Senator. He was born at Covington, Ky., graduated in law at the St. Louis Law School (Washington University) in 1896, and began practice in St. Louis. He represented the Republic of Hawaii in negotiations resulting in its annexation by the United States in 1898. He was a member of the Missouri House of Representatives (1916-17), represented the 11th Missouri District in Congress for three terms (1921-27), and was elected to the United States Senate as a Democrat for the term 1927-33. In the World War he was a captain in the U. S. Army, and was military attaché at Madrid. In Missouri, he was active in the agitation for good roads. He was also an organizer of the Lakes to Gulf Deep Waterways Association.

**HAWK, PHILLIP BOVIER** (1874- ). An American physiological chemist, born at East Branch, N. Y. He was graduated in 1898 at Wesleyan and studied at Yale and Columbia Universities, taking his Ph.D. at the latter in 1903. During 1901-03 he was assistant in physiological chemistry at Columbia and then went as demonstrator of that subject to the University of Pennsylvania. He held a similar professorship at Illinois in 1907-12 and later accepted the chair of physiological chemistry and toxicology at Jefferson Medical College in Philadelphia, 1912-22. Since 1926 he has been president and director of the Food Research Laboratories of New York. Dr. Hawk made a specialty of such subjects as metabolism, animal acids, food and nutrition, and the drinking of water, on all of which he has published papers. Besides editing the *Journal of Metabolic Research*, he was an associate editor of *Chemical Abstracts*. He is the author of *Practical Physiological Chemistry* (1907); *What We Eat and What Happens to It* (1919), and *The Lottery of Love* (1925).

**HAWKES, HERBERT EDWIN** (1872- ). An American educator, born at Templeton, Mass. He was graduated from Yale University in 1896 and was instructor of mathematics in that university in 1898. After post-graduate studies in Germany, he was appointed assistant professor of mathematics at Yale in 1903, serving until 1910, when he became professor of mathematics in Columbia University. In 1917-

18, he was acting dean of Columbia College and after 1918, dean. He is the author of *Advanced Algebra* (1905); *Higher Algebra* (1913); *College, What's the Use?* (1927); and the co-author of several books on mathematics. He has conducted important researches in hyper-complex numbers.

**HAWKINS, SIR ANTHONY HOPE** (1863- ). An English novelist known as Anthony Hope (see VOL. XI), who was knighted in 1918. He published: *A Young Man's Year* (1915); *Captain Dieppe* (1918); *Beaumaroy Home from the Wars* (1919); *Lucinda* (1920); *Little Tiger* (1925); and *Memories and Notes* (1927).

**HAWLEY, RALPH CHIPMAN** (1880- ). An American forester, born at Atlanta, Ga. He graduated from Amherst College in 1901 and from the Yale School of Forestry in 1904. After serving with the United States Forest Service, he was assistant State Forester of Massachusetts (1906-07) and professor of forestry at the Yale School of Forestry (1907- ). Professor Hawley is the author of *Forestry in New England* (1912); *A Manual of Forestry* (1918); and *The Practice of Silviculture* (1921).

**HAWORTH, PAUL LELAND** (1876- ). An American author, born at West Newton, Ind. He graduated from Indiana University in 1899 and took post-graduate courses in history at Columbia University. He was a member of the faculty of several schools and colleges, including the Michigan Northern State Normal School, Columbia University, and Bryn Mawr College, from 1906 to 1911. In 1916 he made explorations in the Canadian Rockies and revisited the same region in 1919, discovering new lakes and mountains. In 1918-19, he was acting professor of history at Indiana University and was a member of the Indiana House of Representatives in 1920-21. Since 1922 he has been professor of history at Butler College, Indianapolis, Ind. He was the author of: *The Path of Glory* (1911); *America in Ferment* (1915); *George Washington, Farmer* (1915); *The United States in Our Own Times, 1865-1920* (revised, 1924); *Trailmakers of the Northwest* (1921). He edited *The Problems of the Nations* (4 vols.).

**HAWTHORNE, CHARLES WEBSTER** (1872- ). An American painter (see VOL. XI). Among his later awards were the Altman Prize, National Academy of Design, 1915; the Temple Medal, 1915; the Lippincott Prize, Pennsylvania Academy of Fine Arts, 1922; the Harris Prize and silver medal, 1923; the W. A. Clark Prize and silver medal, Corcoran Gallery Washington, 1923; the Carnegie Prize, Academy of Design, 1924; the Proctor Prize, National Academy of Design, 1926; the first W. A. Clark Prize, Corcoran Gallery, 1926. In his later paintings, among them, "Fisherman and Daughter," and "Adoration," there was still a spirit reminiscent of the Italian primitives.

**HAY, IAN.** See BEITH, JOHN HAY.

**HAY, WILLIAM HENRY** (1860- ). An American army officer, born in Jefferson County, Fla. He was graduated from the United States Military Academy in 1886, entered the United States Army as second lieutenant of the 3d Cavalry, and continued in the service until his retirement in 1923, in which year he was also made a major general. As colonel, he commanded the 15th Cavalry in the Philippines in 1917; and in the World War, he commanded the 28th Division, participating in the campaigns of

the St. Die sector, the Vosges, the Pont à Mousson sector, the Thiancourt sector, the Meuse-Argonne offensive, and the offensive of the 2d Army Corps. Later, he served in the Inspector General's office (1920) and then with the General Staff (1921). He was chief of staff of the American forces in Germany, 1921-22. For his services, he received the United States Distinguished Service Medal, and the Croix de Guerre with two palms, and was made a commander of the Legion of Honor and the Black Star (French), and the Order of Leopold (Belgian).

**HAYAKAWA, SESSUE KINTARO** (1889- ). A Japanese actor and playwright, who was born in Tokyo and graduated from the Navigation School of Japan in 1907, when he came to America. He studied political economy and literature at the University of Chicago and starred in moving pictures with various companies, including his own. Among his productions, of which he is also author, are *His Birthright*; *Hearts in Pawn*, and *Even unto Eternity*.

**HAYES, CARLTON JOSEPH HUNTLEY** (1882- ). An American educator and historian, born at Afton, N. Y. He graduated from Columbia University in 1904, and after post-graduate courses at that university became lecturer in history in 1907, assistant professor in 1910, associate professor in 1915, and full professor in 1919. In the World War, he served as captain of the United States Military Intelligence Division of the General Staff in 1918-19. He is a member of many historical and other learned societies and is the author of *Sources Relating to Germanic Invasions* (1909); *British Social Politics* (1913); *Political and Social History of Modern Europe* (1916; revised, 1924); *Brief History of the Great War* (1920); *Essays on Nationalism* (1926). He is also co-author of *The League of Nations; Principle and Practice* (1919); *International Relations* (1922); *Modern History* (1923); *Recent Political Theory* (1924); *These Eventful Years* (1924); *Ancient and Medieval History* (1928).

**HAYES, DOREMUS ALMY** (1863- ). An American theologian (see VOL. XI). He published *Paul and His Epistles* (1915); *John and His Writings* (1917); *The Synoptic Gospels and the Book of Acts* (1919); *Great Characters of the New Testament* (1920); *New Testament Epistles* (1921); *Greek Culture and the Greek Testament* (1925); *The Heights of Christian Love* (1926); *The Heights of Christian Unity* (1927).

**HAYES, PATRICK JOSEPH** (1867- ). An American cardinal, born in New York, and educated at Manhattan College, New York City, and the Catholic University of America. He was ordained priest in 1892, was president of Cathedral College from 1903 to 1914, and became rector of St. Stephen's Church in 1915. He was made Archbishop of New York in 1919. During the World War, he was appointed Catholic chaplain bishop for the United States Army and Navy. In 1924 he was nominated as cardinal, and went to Rome to be formally inducted into the office.

**HAYES, SAMUEL PERKINS** (1874- ). An American psychologist, born at Baldwinsville, N. Y. Educated at Amherst College, Union Theological Seminary, Columbia and Cornell universities, he became professor of psychology at Mount Holyoke in 1906. He was also director of psychological research of the Pennsylvania Institution for the Blind, the Perkins

Institution and the Massachusetts School for the Blind. He specialized in the psychology of the blind and color blindness and published an important monograph; *Mental Measurement of the Blind* (1915).

**HAY FEVER.** This affection tends to merge itself in the larger group of foreign protein sensitizations, and to range itself more and more with the asthmas and food intoxications. The former plan of inoculation in the spring with mixed pollens seems to be giving way more and more to a policy of identifying the specific exciter of the disease and immunizing against it. Dr. Schleppegrell of New Orleans has done great service in describing all plants that can set up hay fever and in giving them something of a rating as to their individual importance. In 1922 Dr. Vaughan of Richmond published the result of his experiments in isolating the offending plant in the individual case. Only when immunization with mixed pollens has failed will it become necessary to take these pains. In intractable cases, this author found that the patients were especially sensitive to the short-ragweed pollen, although this does not mean that the individual is insensitive to all others. However, the patients in question recovered under injections of the pollen of this plant although, instead of the usual weekly injection, he employed daily injection, and it therefore is suggested that the latter plan be adopted in the obstinate case. In regard to the possibility that the patient in such cases has benefited by previous treatment, the author states that untreated subjects furnished the same result. In order to determine sensitiveness to individual pollens, the skin reaction is employed. The author usually preferred to make successive routine tests with short ragweed, giant ragweed, timothy, daisy, sunflower, corn, orchard grass, goldenrod, etc., although with most of these plants reaction will be negative. This is evidently preferable to attempt at selection.

Recent experience has shown the necessity of an occasional revising down of the list of plants which are noxious or innocuous for hay-fever sufferers. Thus, goldenrod, once regarded as hostile in this respect, has now been given a clean bill of health; and conversely, the paper mulberry, once pronounced innocent, has recently been shown to cause hay fever, and quite a few cases have been traced to it during the past two years. Certain Greek emigrants who had been sensitized to this pollen in the old country have developed hay fever attacks from this cause in the United States.

**HAYS, WILLIAM CHARLES** (1887- ). An American architect, born in Philadelphia, Pa. He graduated from the University of Pennsylvania and studied in Paris, beginning the practice of his profession in 1895. In 1904 he removed to California. He became assistant professor of architecture at the University of California in 1906 and was acting director of the School of Architecture, 1917-19. Since 1927 he has been full professor. He was consulting architect of that university and designed many of its buildings.

**HAYS, WILLIAM HARRISON** (1879- ). An American lawyer and public official, born at Sullivan, Ind. He was graduated at Wabash College in 1900, later studying law. He became chairman of the Republican Central Committee of Indiana in 1910 and in 1918 was chosen chair-

man of the Republican National Committee, continuing in that office until 1921, when President Harding appointed him to his cabinet, as Postmaster General. This place he held for one year and then resigned to become president of the Motion Picture Producers and Distributors of America. During the World War, he was chairman of the Indiana State Council of Defense.

**HAYWARD, WILLIAM** (1877- ). An American lawyer, born at Nebraska City, Nebr. He was educated in Munich, Germany, and studied law at the University of Nebraska, beginning practice in Nebraska City in 1897. During the Spanish-American War, he served as colonel of the 2d Infantry of Nebraska. He removed to New York in 1911 and became a member of the law firm of Wing & Russell. He was assistant district attorney for 1913-14, and was appointed member of the Public Service Commission in 1915. He resigned to recruit and organize the 15th Infantry (colored), which later became the 369th United States Infantry, and he commanded this organization in France. He was awarded the Croix de Guerre, also decorations from the United States and foreign governments. He served as United States Attorney for the Southern District of New York (1921-25).

**HAYWOOD, WILLIAM DUDLEY** (1869-1928). An American labor leader (see VOL. XI). He became conspicuous early in 1917, when, as secretary of the Industrial Workers of the World, with headquarters in Chicago, he was arrested on a charge of seditious conspiracy. He was sentenced to 20 years' imprisonment and to pay a fine of \$10,000, but was released on bail, and, in April, 1921, he fled to Russia. In March, 1922, he headed a group of American members of his organization who received a concession to operate the Nadejdinsky Iron Works in Russia. The enterprise was unsuccessful and Haywood became leader of the Kuzbas autonomous colony, in Siberia. This, too, failed, and he returned to Moscow in 1923, where he spent the rest of his life in minor activities for the Soviet government.

**HAZARD, CAROLINE** (1856- ). An American educator (see VOL. XI). During the World War, she was prominent in the work of the Woman's Council of National Defense (1916), the first Liberty Loan (1916), the War Savings Campaign (1917), and the United War Work Campaign (1918). She wrote: *The Yosemite and Other Verse* (1917); *Anchors of Tradition* (1924); *From College Gates* (1925); and *Songs in the Sun* (1927).

**HAZEN, CHARLES DOWNER** (1868- ). An American historian (see VOL. XI). He was professor of history at Columbia University after 1916 and at the University of Strasbourg, France, in 1920-21. His later works include: *Modern European History* (1917); *The French Revolution and Napoleon* (1917); *Alsace-Lorraine Under German Rule* (1917); *The Government of Germany* (1917); *Fifty Years of Europe* (1919); and *Modern Europe* (1920). He also edited *Historical Essays by Lord Macaulay* (1921); *The Kaiser vs. Bismarck* (1921); and *The Letters of William Roscoe Thayer* (1926).

**HAZEN, SIR JOHN DOUGLAS** (1860- ). A Canadian lawyer and statesman (see VOL. XI). He represented Canada at the Imperial War Cabinet in 1917, and in 1917-19 was chairman of the Canadian Section of the Interna-

tional Fisheries Commission. He also became Chief Justice of New Brunswick in 1917 and in the following year was knighted.

**HEAD, SIR HENRY** (1861- ). A British neurologist who was educated at the Charterhouse School and Trinity College, Cambridge, and received his medical degree from Cambridge in 1892. He also studied at the universities of Halle and Prague. He made many contributions to neurology and described the sensory areas of the skin known as Head's zones. For some years, he was editor of *Brain*. His work, *Studies in Neurology*, appeared in two volumes in 1919; and in 1926 he published *Aphasia and Kindred Disorders of Speech*, also in two volumes. He attracted much attention through dangerous self-experimentation. He was knighted in 1927.

**HEADLAM, hēd'lām, THE RT. REV. ARTHUR CAYLEY** (1862- ). An English theologian, Bishop of Gloucester since 1923 (see VOL. XI). He was Regius Professor of Divinity, Oxford University, Canon of Christ Church, Oxford (1918-23), and Bampton Lecturer (1920). His later works include: *The Miracles of the New Testament* (1914); *The Revenues of the Church of England* (1917); *The Study of Theology* (inaugural lecture, 1918); *The Doctrine of the Church and Christian Reunion* (Bampton Lectures, 1920); *The Life and Teachings of Jesus Christ* (1923); *The Church of England* (1924); *Jesus Christ in Faith and History* (1925); *Economics and Christianity* (1926); and *The New Prayer Book* (1927). See GLOUCESTER, BISHOP OF.

**HEALY, TIMOTHY MICHAEL** (1855- ). An Irish Nationalist leader (see VOL. XI), and Governor General of the Irish Free State (1922-28). His later publications are *The Great Fraud of Ulster* (1917); *The Planter's Progress*; and *Letters and Leaders of My Day* (1928). Consult *The Life of Tim Healy*, by Liam O'Flaherty (1927).

**HEARING.** See AUDITION.

**HEARST, WILLIAM RANDOLPH** (1863- ). An American newspaper publisher (see VOL. XI). Although he took no active part as a candidate in politics after 1920, he continued to exercise influence through his list of newspapers, which was increased to 27 in all parts of the country. He also was the owner of many magazines of wide circulation, including *Good Housekeeping*, *Hearst's International-Cosmopolitan*, *Harper's Bazar*, and *Pall Mall Magazine* (London). Consult *W. R. Hearst: An American Phenomenon*, by John K. Winkler (1928).

**HEART DISEASE.** The enormous death rate from heart disease, to say nothing of the invalidism from the same cause, has been responsible for a concerted effort throughout the United States with the aim of salvaging and rehabilitating the cardiac cripple. At present, there are 178 heart clinics in the United States and Canada, 42 of which are in New York City alone with 16 devoted solely to children. In 1928 these clinics cared for about 8500 patients in the metropolitan area. About 1 per cent of school children have crippled hearts and attempts are in progress to segregate such children for combined school instruction and medical care. Results have been sufficiently encouraging to look forward to extension of this movement to all school children of the metropolis. In quite recent years, convalescent homes and sanatoria have been opened to cardiac patients and special

ones are being erected for them; so that, at present, there are 35 or more of general and special institutions for this purpose. During the past five years, about a thousand children have been interned in Greater New York. It is far too soon to predict the effect of these salvage efforts on the death rate. As to the actual prevention of heart disease, this question is not involved, for this involves the prevention of acute rheumatism, focal infection, syphilis, scarlet fever, and other maladies.

Since 1918 cardiac therapeutics seems to have been greatly enriched by the introduction of the drug quinidin, which already vies with digitalis in making it possible for a man with advanced heart disease to live and labor. Quinidin is even superior in some ways to the other remedy because it seems equal to an actual cure of cases of permanent loss of rhythm, indicating deep-seated disease. See ADRENALIN.

**HEBER, CARL AUGUSTUS** (1874- ). An American sculptor who was born in Stuttgart, Germany. He studied with Taft, in Chicago, and became a member of the National Sculpture Society in 1904. He was also a member of the New York Architectural League and well known for his designing of memorials. His work includes the "Champlain Memorial" at Crown Point, N. Y., the "Champlain Statue" at Plattsburg, N. Y., the "Schiller Monument" at Rochester, N. Y., the Benjamin Franklin" at Princeton University and "Pastoral" exhibited at the Art Institute in Chicago. Among his awards were a bronze medal from the St. Louis Exposition in 1904 and a bronze medal from the Panama-Pacific International Exposition in 1915.

**HECHT, BEN** (1893- ). An American author, born in New York City. He was educated in Racine, Wis., and began his journalistic career with the *Chicago Journal* in 1910. He was on the staff of the *Chicago Daily News* from 1914 to 1923. From December, 1918, to December, 1919, he was correspondent in charge of the Berlin office of the *News*. He was publisher of the *Chicago Literary Times*, 1923-25. He is the author of *Bricks Dorn* (1921); *Gargoyles* (1922); *Pantastus Mallare* (1922); *The Nigolistic* (drama); *The Florentine Dagger*; *1001 Afternoons in Chicago* (1923); *The Nigolistic* (drama, 1923); *Humpty Dumpty* (1924); *Count Bruga* (1926); *Broken Necks* (1926); *The Front Page*, a play, with Charles MacArthur (1928), and short stories in the magazines.

**HEDIN, hē-dēn, SVEN ANDERS** (1865- ). Swedish explorer and author (see VOL. XI), president of the Royal Swedish Academy of Sciences. He made a journey around the world in 1923, and discovered 30 dinosaur skeletons of the Jurassic period on his expedition to the country near Santai, Asia, in 1928. It was the first discovery in Asia of dinosaurs of that age. His works were translated into many languages. The later ones include: *Alt ord till Norges folk* (1914); *With the German Armies in the West* (1915); *The War against Russia* (1915); *Till Jerusalem* (1917); *Bagdad, Babylon, Ninive* (1917); *Southern Tibet* (12 vols., 1917-22); *Fünf Routenaufnahme durch Ostpersien* (2 vols., 1918-26); *En lemnads teckning* (1920); *Resare Bengt* (1921); *Mount Everest* (1922); *From Peking to Moscow* (1924); *My Life as an Explorer* (1925); and *The Grand Canyon of Arizona* (1925). Consult *Mein Bruder Sven*, by Alma Hedin (1925).

**HEDJAZ.** See ARABIA; CALIPHATE.



**HEDRICK, EARLE RAYMOND** (1876- ). An American mathematician, born at Union City, Ind. He was graduated from the University of Michigan in 1896, held fellowships at Harvard, and took his Ph.D. at Göttingen in 1901. During 1901-03 he was instructor of mathematics at the Sheffield Scientific School at Yale University, but in the latter year became professor of mathematics at the University of Missouri, where he remained until 1924. Since 1924 he has been professor of mathematics in the University of Southern California at Los Angeles. He became editor-in-chief in 1921 of the *Journal of the American Mathematical Association*, of which organization he was president in 1916. Dr. Hedrick edited *A Series of Mathematical Tests* and (with D. C. Jackson) the *Engineering Science Series*. He wrote *A Course in Mathematical Analysis* (1904); an *Algebra for Secondary Schools* (1908); and *Application of the Calculus to Mechanics* (1909).

**HEFLIN, J (AMES) THOMAS** (1869- ). A United States Senator who was born in Randolph County, Ala., and studied at the Southern University and the Agricultural and Mechanical College at Auburn, Ala. He was admitted to the bar in 1893. In 1902-04 he was Secretary of State (Ala.) and in 1904 was elected to fill an unexpired term in Congress as a representative of the Fifth Alabama District. He was re-elected for eight succeeding terms (1905-21) and resigned in 1920 to be elected to the United States Senate for the unexpired term of John H. Bankhead. He was re-elected for the term 1925-31. In the presidential campaign of 1928, he bolted the Democratic party following the nomination of Alfred E. Smith.

**HEGELER, A. WILHELM** (1870- ). A German novelist. He was born at Varel and studied at the universities of Berlin, Munich, Vienna, and Geneva. He is the author of: *Son-nige Tage* (1898); *Nellys Millionen* (1899); *Pastor Klinghammer* (1903); *Flammen* (1905); *Ingenieur Horstmann* (1906); *Das Aergerniss* (1907); *Die Leidenschaft des Hofrat Horn* (1914); *Die goldene Kette* (1915); *Zwei Freunde* (1921); *Der verschüttete Mensch* (1923); *Der Apfel der Elisabeth Hoff* (1924); and *Die zwei Frauen des Valentin Key* (1927). He also wrote a monograph on *Heinrich von Kleist*.

**HEGER, ROBERT** (1886- ). A distinguished German conductor and composer, born at Strassburg. He began his musical education at the Conservatory of his native town, continued it in Zurich and finished with Max Schillings in Munich. In 1907 he was appointed conductor at the opera in Strassburg, and then filled similar positions in Ulm (1908), Barmen (1909), and at the Volksoper in Vienna (1911). During 1913-21 he was conductor of the opera and of the Philharmonic concerts in Nuremberg, after which he went to Munich. In 1925 he returned to Vienna as conductor at the Staatsoper. A short season of German opera by the entire company under his direction, in Paris in 1928, aroused such enthusiasm that a similar season was given in 1929, which was repeated the same year in Stockholm, Copenhagen, Berlin, and Milan. His works consist of an opera, *Ein Fest auf Haderslev* (Nuremberg, 1919); two symphonies; a symphonic poem, *Hero und Le-andier*; a violin concerto in D; *Ein Friedenslied* for soli, chorus, organ, and orchestra; chamber music and songs.

**HEGNER, ROBERT WILLIAM** (1880- ). An American zoologist born at Decorah, Iowa. He was educated at the University of Chicago and at the University of Wisconsin (Ph.D., 1908). He was assistant at the University of Chicago (1905-07), professor of biology, State Normal School, River Falls, Wis. (1907), assistant in zoology at the University of Wisconsin (1907-08), and instructor at the University of Michigan (1908-10). In 1910 he went to Johns Hopkins University, where he was successively assistant professor, associate professor, and professor in charge of the department of medical zoology. In 1921 he headed an expedition for the study of tropical medicine in Porto Rico and Venezuela. He published: *College Text Book of Zoology* (1910); *The Germ Cell Cycle in Animals* (1914); and *Host-Parasite Relations between Man and His Intestinal Protozoa* (1927); besides works in collaboration with others.

**HEIBERG, HÖYBÖRG, GUNNAR EDVARD RODE** (1857- ). A Norwegian dramatist and critic (see Vol. XI). His later works include *Set og hort*, essays (1917); *Ibsen og Bjørnson på scenen* (1918); *Franske visitter*, biographical essays (1919); and *Norsk teater* (1920). In 1917 his plays were collected in four volumes.

**HEIDENSTAM, HJØDEN-STÅN (KARL GUSTAF VERNER VON)** (1859- ). A Swedish poet and author (see Vol. XI), a member of the Swedish Academy, who in 1916 received the Nobel Prize for literature. His later works include *Om Svenskarnas lynne* (1914); *Va vilja vi?* (1914); *Nya dikter*, verse (1914); *Det defästa huset och andre berättelser ur "Karolinerna"* (1915); *Uti drag af Skrifter* (1922); *Tänkar och teckningar*, essays (1924); and *Nya Dikter*, poems (1924). Many of his earlier works were translated into English. Consult *Sweden's Lauricate*, selected poems translated, with an introduction, by Charles Wharton Stork (1919).

**HEIFETZ, JASCHA** (1899- ). A Russian violinist, born at Vilna. He is one of the most remarkable cases of precocity on record, for at the age of three he began to receive regular instruction on the violin from his father. After a little more than a year, he was admitted to the Imperial Music School at Vilna. At the age of six, he played Mendelssohn's concerto in public at Kovno, scoring a sensational success. Nevertheless, he continued his studies at the Music School until 1907, when he became a pupil of Auer at the Petrograd Conservatory. Even before he graduated, he made frequent public appearances which spread his fame through Russia. His international fame dates from the phenomenal success of his Berlin début (1912), which he repeated the next year in Vienna, and the following year in all the principal cities of Germany. After an equally successful tour of Scandinavia, he made his American début in New York (Oct. 27, 1917). His American tours were an uninterrupted series of triumphs. In 1921 he made a tour of Australia. Even before he was out of his teens, he was universally recognized as the equal of the greatest living violinists. Auer is said to regard him as his greatest pupil.

**HEIJERMANS, HJ'YER-MANS, HERMANN** (1864-1924). A Dutch dramatist and novelist (see Vol. XI). Among his later works were *Robert Bertram et Cie* (1914); *Nova Bonheur* (1919); *Dageraad* (1921); *Feest*, in the English translation, *Jubilee* (1923); and *Salimbank*, also in English (1923).

**HEINZE**, hin'tse, RICHARD (1867- ). A German scholar and rector of the University of Leipzig (1921-22). He was born at Naumburg and studied at Bonn, Leipzig, and Berlin. He was lecturer at the University of Strasbourg (1893-99), then professor at the universities of Berlin, Königsberg, and Leipzig. He is the author of: *De Horatio Bionis Imitatore* (1889); *Xenokrates* (1893); an interpretation of the third book of *Lucretius* (1897); *Virgils epische Technik* (1915); *Ciceros politische Anfänge* (1909); *Tertullii Apologeticum* (1911); *Die lyrischen Werke des Horaz* (1919); *Ovids elegante Erzählungen* (1920); and *Von den Ursachen der Grösse Roms* (1925).

**HELFERRICH**, KARL (1872-1924). A German economist and public official. He was born at Neustadt and educated at the universities of Munich, Berlin, and Strasbourg. He taught at the University of Berlin and later at the government school for colonial politics and Oriental languages. In 1902 he entered upon a diplomatic career. He soon became a leader in the German government's policy of economic imperialism, and in 1906 he was appointed director of the Anatolian Railway. In 1908 he was made director of the powerful Deutsche Bank in Berlin. At the close of the Balkan War, he was the German financial delegate to the international conference (1913). He was Minister of Finance from 1915 to 1917, and was said to be responsible for the policy of financing the World War through loans instead of taxes. After the Treaty of Brest-Litovsk, he was sent to Moscow as the German Ambassador to Russia, succeeding Von Mirbach, who was assassinated. Elected to the Reichstag of 1920, Helferrich threw in his influence with the extreme Nationalists and would have nothing to do with the economic fulfillment of the Versailles Treaty. He was killed in a railway wreck on Apr. 23, 1924. His works comprise chiefly economic and political studies, and include *Die Reform des deutschen Geldwesens nach der Gründung des Reiches* (1898); *Handelspolitik* (1901); *Geld und Bank* (1903); *Die Weltkrieg* (1919).

**HELICOPTER**. See AERONAUTICS.

**HELIOTROPISM**. See ZOOLOGY, under Tropisms.

**HELIUM**. See AERONAUTICS; CHEMISTRY, APPLIED.

**HELLER**, EDMUND (1875- ). An American naturalist, born at Freeport, Ill. He graduated from Leland Stanford, Junior, University in 1901. From that year to 1907, he was naturalist for the Field Museum in Chicago and was engaged in exploration in California, Mexico, Guatemala, and East Africa. In 1907-08 he was curator of mammals at the University of California Museum of Natural History, and in 1909-10, naturalist for the Smithsonian African Expedition in East Africa under the direction of Theodore Roosevelt. He was a member of expeditions in Africa, Peru, and China (1909-17). During the World War, he served on the photographic staff of the Czechoslovak Army in Siberia. He was a member of the Expedition of the Smithsonian Institution in Africa (1919-20), of the expedition across Peru and down the Amazon to its mouth (1922-23), and of that to the Mountains of the Moon and Gorilla volcanoes in Central Africa (1924-26). Later, he became assistant curator of mammals for the Field Museum, Chicago. He was the joint author (with Theodore Roosevelt) of *Life Histories of*

*African Game Animals* and wrote numerous papers on fishes, reptiles, and birds.

**HELLMAN**, GEORGE SIDNEY (1878- ). An American author, born in New York City, and educated at Columbia University. In 1918-19 he served as director of the Department of Fine and Applied Arts for the Army Educational Commission of the Y. M. C. A., in 1919 as director of instruction in Fine and Applied Arts of the American Expeditionary Forces, and in the same year, as director of the American Expeditionary Force Art Training Centre at the Bellevue in Paris. He served on several commissions relating to war memorials and in 1920 became treasurer and director of the Ilugo Ballin Productions. His writings include *The Hudson and Other Poems* (1909); *Applied Arts and Education* (1919); *Art and the Citizen* (1919); *The Way It Ended* (1920); *Washington Irving, Esq.* (1925); *The True Stevenson* (1925); *Landscapes of Memory* (1927). He also edited the poems of Stevenson and letters of Irving and contributed poems and stories to magazines.

**HELMICK**, ELI ALVA (1863- ). An American army officer, born at Quaker Point, Ind. Graduated at the United States Military Academy in 1888, he was made second lieutenant in the 11th Infantry and rose to the rank of major general in 1921. He served in Idaho during the Cœur d'Alene riots (1892), in the expedition of Santiago de Cuba (1898), against the Moros (1902), on the Mexican border (1910 and 1916), and in the Inspector General's office (1916-18). During the World War, he commanded the 8th Division with the provisional rank of major general, and later was in command of the service of supplies at Brest. The United States Distinguished Service Medal was conferred on him. In 1921 he was appointed inspector general and in September, 1927, he was retired.

**HEMING**, ARTHUR (1870- ). A Canadian illustrator and writer, born at Paris, Ont., who came to the United States as a student and was a pupil of Frank Brangwyn and Frank V. DuMond. Mr. Heming knows his natural scenery and puts it on canvas with a peculiar gift. Among the books which he has written and illustrated are *Spirit Lake*; *Drama of the Forest*; and *The Living Forest*. In the Royal Ontario Museum, there are 10 of his pictures on exhibition and he is also represented in the Canadian National Gallery. He was awarded a gold medal for the best work, bronze medal for best illustrations, and the MacLean Prize for illustration by the Canadian Society of Graphic Arts in 1926.

**HÉMON**, LOUIS (1880-1913). A French author who was born and educated at Brest, where his father was a professor. He took his degree in Oriental languages, but preferred story writing and sport to a university career. He won literary prizes with two short stories (1906). For a while he lived in the poorer quarters of London, where he wrote *Lizzie Blakeston*, published in *Le Temps* in 1908, and in October, 1911, he went to Canada, where he wrote the novel, *Maria Chapdelaine*. He was killed by a train near Chapleau, in western Ontario, July 8, 1913. *Maria Chapdelaine* was first published in *Le Temps* (Paris) just before the World War. His other works, published posthumously, include *La belle que voilà*, stories (1923); *Colin-Maillard*, trans. as *Blind Man's Buff* (1924); *The Journal of Louis Hémon*

(1924); *Monsieur Ripois and Nemesis* (1925); and *Battling Malone, pugiliste* (1925).

**HENCKELL**, hĕnk'el, KARL FRIEDRICH (1864- ). A German poet (see VOL. XI) identified with Young Germany of the eighties. After 1914, he published *Lyrik und Kultur* (1914); *Weltmusik* (1918); *Gedichte* (1921); *Buch des Kampfes*; *Buch der Saat* (1923); and *An die neue Jugend* (1924).

**HENDERSON**, ARCHIBALD (1877- ). An American mathematician and author (see VOL. XI). Since 1920 he has been at the head of the mathematics department at the University of North Carolina. His later books include *O. Henry* (1914); *Star of the Empire* (1919); *Conquest of the Old Southwest* (1920); *The Teaching of Geometry* (1921); *Relativity—a Romance of Science* (1923); *Washington's Southern Tour* (1923); and *Table Talk of G. B. S.* (1925).

**HENDERSON**, RT. HON. ARTHUR (1863- ). A British public official, born in Glasgow, Secretary of the National Labor Party. He worked as an iron founder in Newcastle, became interested in the labor movement, and held various trade-union positions. He was also a Wesleyan Methodist preacher. He was on the Newcastle City and Darlington Borough Councils, was mayor of Darlington (1903), and a member of Parliament (1903- ). He was chairman of the Parliamentary Labor Party (1908-10, 14-17), chief whip of the Labor Party (1914, 1921-24, 1925-27), and became a Privy Councillor in 1915. He held cabinet positions as president of the Board of Education (1915-16), Paymaster General and Labor Advisor to the Government (1916), and Minister without Portfolio in the War cabinet (1916-17). In the latter year, he went on a special government mission to Russia. In Ramsay MacDonald's first Labor government (1924), he was Home Secretary and in the second (June, 1929- ), he was Secretary of State for Foreign affairs. He was also an internationally prominent figure in the labor world, and was president of the Labor and Socialist International (1926- ). He wrote *The Arms of Labor* (1918); *Industrial Law* (with Sir Harry Slessor, 1924), and *Trade Unions and the Law* (1927).

**HENDERSON**, LAWRENCE JOSEPH (1878- ). An American biological chemist born at Lynn, Mass. He was educated at Harvard (M.D., 1902) and at the University of Strassburg. He was lecturer in biological chemistry (1902-03), instructor (1903-10), assistant professor (1910-19), and professor (1919- ) at Harvard. Professor Henderson published *Fitness of the Environment* (1913), *The Order of Nature* (1917), and numerous papers dealing with applications of physical chemistry to biology. He is a member of the National Academy of Sciences and numerous other learned societies.

**HENDRICK**, BURTON JESSE (1871- ). An American writer, born in New Haven, Conn., and educated at Yale. For several years he was on the staff of newspapers in New Haven and New York. He was associate editor of *The World's Work* from 1913 to 1927. He wrote *The Age of Big Business* (Chronicles of America series, 1919); *Life and Letters of Walter Hines Page* (this book won the Pulitzer Prize for the best American biography of 1922); *The Jews in America* (1923); *Training of an American: The Earlier Life and Letters of Walter U. Page* (1928), which also won the Pulitzer Prize for

the best volume of American biography for that year. He was co-author, with Admiral William Snowden Sims, of *The Victory At Sea*, awarded the Pulitzer Prize as the best book published in 1920 on the history of the United States and, with Marie Doughty Gorgas, of *William Crawford Gorgas, His Life and Work*. He was a frequent contributor to magazines.

**HENDRICK**, ELLWOOD (1861- ). An American lawyer (see VOL. XI). In 1917-18 he studied chemistry at Zurich under Victor Meyer, and on his return to the United States was superintendent of the Albany Aniline and Chemical Works (1881-84), then, turning his attention to insurance and stock brokerage, continued in that business until 1915, when he retired. He was a member of the staff of the research corporation of Arthur D. Little and Company of Cambridge, Mass., 1917-22, and later became curator of the Chandler Chemical Museum of Columbia University. Besides being consulting editor of *Chemical and Metallurgical Engineering*, he is the author of many articles on science in popular magazines and published *Everyman's Chemistry* (1917); *Opportunities in Chemistry* (1919); *Percolator Papers* (1919); *Life of Lewis Miller* (1925); and *Modern Views of Physical Science* (1925).

**HENEY**, FRANCIS JOSEPH (1859- ). An American lawyer (see VOL. XI). In 1917-18, he served as special attorney for the Federal Trade Commission in charge of investigation of the high cost of living, with special reference to the packing industry. In 1924 he was appointed special counsel for the U. S. Senate Committee investigating the Internal Revenue Bureau.

**HENRI**, ROBERT (1865-1920). An American painter and portraitist (see VOL. XI). With the same sincerity of purpose and simplicity of method which he had in former years devoted to unsophisticated European types, he turned in 1914 toward the people of California and the Southwest. Among these later works were "Tam Gan," "Ramon—a Mexican," "Jim Lee," and "A Girl of the Southwest." He was awarded the portrait prize, Wilmington Society of Fine Arts, 1920. His influence as a teacher, preëminently as a personality, continued to be of much importance. *The Art Spirit* (1923) is a compilation by Margery Hyerson of fragments of his letters, and of his talks to students on the spirit, technique, and appreciation of picture making.

**HENRIOT**, ANR'É, ÉMILE (1889- ). A French novelist and literary writer for the *Temps*, who was born in Paris and educated at the École Fénelon and the Lycée Condorcet. In 1924 he won the French Academy's Grand Prix du Roman with *Archie Brun, ou les vertus bourgeoises*, the story of a bourgeois family. His other works include *Poèmes à Sylvie* (1906); *Eurydice* (1907); *Petite Suite italienne* (1909); *L'instant et le souvenir* (1912); *A Quoi rêvent les jeunes gens*, a history and criticism of twentieth-century French literature (1913); *La Flamme et les Cendres* (1915); *Carnet d'un dragon dans les tranchées* (1918); *Valentin* (1919); *les temps innocents* (1921); *Aquarelles, 1914-1921*, poetry (1922); *Courrier littéraire* (1922); *Aventures de Sylvain Dufour* (1922); *Stendhaliana* (1924); *Les livres du second rayon; irréguliers et libertins*, history and criticism (1925); *Voltaire et Frédéric II* (1927); *En Provence* (1927); and *L'art de former un bibliothécaire* (1928). In 1926 he edited, with an in-

roduction and bibliography, Musset's *Confession d'un enfant du siècle*.

**HENRI-ROBERT**, *rôbar*, JACQUES (1863- ). A French barrister who was born in Paris and educated at the École Fénélon and the Lycée Condorcet. An irresistible speaker, he became a criminal lawyer—a branch of the law then in ill repute—and rose rapidly, finally becoming the leader of the French bar, a position rarely held by a member in its criminal branch. In 1923 he was elected a member of the French Academy. His well-known literary work was *Les grands procès de l'histoire* (4 vols., 1924-25), an account of the great trials of history. He also wrote *L'effort de Paris* (1907) and *Le maréchal Foch* (1919), two lectures; *L'avocat*, a history of the customs of the bar (1923); *Le palais de justice* (1927); *Malesherbes* (1927); and *Louis XVI* (1928).

**HENRY**, PRINCE OF PRUSSIA (HEINRICH ALBERT WILHELM) (1862-1929). A German admiral and brother of the ex-Kaiser of Germany (see VOL. XI). He was commander-in-chief of the Baltic fleet during the World War, was second in command at the Battle of Jutland, and was ardent in his support of Germany's submarine warfare. He was forced to flee from Kiel when the revolution broke out there in 1918, and retired to his estate in Schleswig-Holstein, where he died of pneumonia and complications on Apr. 20, 1929.

**HENRY**, ROBERT LLEWELLYN, JR. (1882- ). An American professor, of law, born at Chicago, educated at the University of Chicago, and as Rhodes scholar at Oxford, England; also at Heidelberg, Germany, and Grenoble, France. He held the position of professor of law at several State universities, 1907-16. During the World War, he was captain and then major of infantry in the Officers Reserve Corps. In 1919-20 he was a member of the War Department Board of Contract Adjustment in Washington. He lectured at Oxford, England, during 1921-22. Later, he was appointed judge of the Mixed Court at Alexandria, Egypt. His writings include: *Liens and Pledges* (1913); *Consideration in Contracts 601 A.D. to 1520 A.D.* (1917); *Anglo-Saxon Contracts* (1917); *Contracts in the Local Courts of Medieval England* (1926).

**HENSON**, Rt. Rev. HERBERT HENSLEY (1803- ). An English clergyman and author (see VOL. XI), Bishop of Durham since 1920. He was Dean of Durham (1912-18), Bishop of Hereford (1918-20), and honorary professor of modern history at Durham University. His later publications include: *War-Time Sermons* (1915); *Robertson of Brighton, 1816-1853* (1910); *Christian Liberty* (1918); *Anglicanism* (1921); *In Defense of the English Church* (1923); *Byron: The Rede Lecture* (1924); *Quo Tendimus?* (1924); *Notes on Spiritual Healing* (1925); *Church and Parson in England* (1927); *The Booth and the Vote* (1928). He edited *The Naked Truth*, by Bishop Croft (1919); and *Sir William Anson: a Memoir* (1920). See DURHAM, BISHOP OF.

**HEPBURN**, A (LONZO) BARTON (1846-1922). An American banker, philanthropist, and author (see VOL. XI). He was a member of the Federal Advisory Council of the Federal Reserve Board, in 1918, and was a prominent member or officer of important associations concerned with economics and political science. In 1915 he wrote and published *A History of Currency in the United States*.

**HERBERT**, VICTOR (1850-1924). An Irish-American conductor and composer (see VOL. XI). Among the numerous productions of his last decade, the following achieved conspicuous success: *Princess Pat* (1915); *Eileen* (1917); *Angel Face* (1919); *Orange Blossoms* (1921); and *The Dream Girl* (1924). In the field of light opera, Herbert not only towers far above all his American colleagues because of his inexhaustible melodious invention, splendid orchestration, and solid technical attainments but has securely established his place by the side of such masters as Johann Strauss, Offenbach, Millöcker, Suppé, and Sullivan.

**HEREDITY**. An observational and experimental study of the laws governing the transmission of physical or mental characteristics through successive generations of animals, or of physical characteristics in plants, the laws being in general the same in the two great groups of living beings. A complete theory of heredity must offer an explanation of two sets of phenomena—first, the fact that, on the whole, offspring resemble their parents more than they resemble other members of the race; and second, that this resemblance is never absolute but the offspring always show some differences from the parents, i.e., they show variability.

An important date in the history of this subject is 1809, when Lamarck formulated his theory of the effects of use and disuse of organs and of the effect of environment on the structure of plants and animals. According to Lamarck, the increased size of an organ through use or its decreased size following disuse was passed on to the offspring, so that in the course of generations, descendants of the original animals, through accumulation of these structural changes, would be quite unlike their ancestors. Similarly, plant structures would be modified in response to climatic conditions, or to changes in the environment, such as moisture or chemical composition of the soil, so as to lead in the end to considerable structural modifications.

Lamarck was arguing in favor of the evolution of species and developed this theory as an explanation of this evolution, but running, as it did, contrary to the generally held belief in the fixity of species, the theory met with nothing but opposition, and it was only after 1859, when Darwin's formulation of a theory of evolution was widely accepted, that it received recognition. In the evolutionary writings from 1859 to 1890, there was general acceptance of the doctrine of use-inheritance. This was, indeed, carried to much greater extremes than it was by Lamarck himself, in that there was a general belief that scars resulting from injuries, or the effects of mutilations such as the loss of an organ through accident, would appear as a birthmark in the offspring. Thus, the child of a German student had a birthmark reproducing the scar her father carried as the result of a student duel, and a cat whose tail was cut off by an accident henceforth gave birth to tailless kittens. Cases of this sort which had wide acceptance as popular legends were repeatedly cited as illustrating the method of evolution.

It was clearly recognized that the assumption of the inheritance of acquired characters carries with it the necessity of explaining the mechanism of the process. How, for example, is it possible for the removal of a cat's tail to so affect the sex cells of the cat, situated at a considerable distance from the tail, as to cause her to give

birth to tailless kittens? Darwin proposed as an explanation the "provisional" theory of pangenesis, which assumed that each cell of the body is constantly throwing off gemmules or ultra-microscopic particles which collect in the sex cells. When these sex cells develop, the gemmules are distributed throughout the body of the new individual, and each going to its appropriate group of cells determines the character of their development. These gemmules multiply by fission and may remain dormant for several generations. If through use or disuse or through accident, the structure of a group of cells is changed, the gemmules arising from these cells will be correspondingly modified and when they in turn take part in the construction of a new individual that individual may exhibit the changed character. Herbert Spencer had earlier attempted to explain heredity and the inheritance of acquired characters on the assumption of "physiological units" or ultra-microscopic particles having a definite polarity which are located in the body cells and by the form of their polarity determine the appearance of the cells in which they are. Use or disuse may modify the form of this polarity and thus affect the character of the race. Neither of the above explanations has any experimental basis and both are purely formal.

Later theories are based on more exact knowledge of the actual phenomena of development, knowledge not available at the time that Darwin and Spencer were writing, and a brief summary of these phenomena will be essential here. The starting-point for each new individual in biparental inheritance is the fertilized egg, a single cell formed by the union of two cells, the *ovum* from the mother and the *spermatozoon* from the father. This fertilized egg divides into two cells, each of these divides again, and the process is repeated until eventually the many-celled adult appears. Coincident with these divisions, a process of differentiation goes on, by which different portions of the complex of cells assume different structures adapted to different functions. Examination of any one of these cells under favorable conditions would show that in its central portion or nucleus is a substance called *chromatin* which just before the cell divides breaks up into rods called *chromosomes*, which are arranged in pairs and are constant in number in any one species. When the cell divides, each chromosome of a pair divides, half going to each daughter cell. Thus, the number is kept constant and each cell gets a representative of each chromosome present in the cell from which it arose.

A study of the immature sex cells shows that they also have paired chromosomes, but as they approach maturity, the members of each pair unite more or less closely with one another in a very complex fashion, later to separate and divide with the cells containing them so that the mature sex cell contains only half the normal number of chromosomes. This process is known as *maturation*. When these cells unite in the fertilization process, the number is brought back to normal and it is quite certain that one member of each pair is derived from each parent. In fertilization only the head of the *spermatozoon*, which is practically nothing but chromatin, enters the egg. Since observation shows that inheritance from the father is as strong as that from the mother, it seems evident that whatever material is the carrier of hereditary qual-

ities must be located in the chromatin. It has been shown also in the case of a few animals that the cells which give rise to the sex organs of the new generation seem to be set aside early in the development and to be quite distinct from the other organs of the body.

In the light of this further information, Weismann attacked the problem and worked out an elaborate theory of heredity. He was the first seriously to question the validity of the Lamarckian principle, and began by investigating supposed cases of inheritance of mutilations. For these, he decided there is no evidence whatever. In this connection, he developed the concept of the germ plasm. This may be defined as a material contained in the nucleus of the fertilized egg, whose function is to determine the character of the individual resulting from that egg. During development, portions of the germ plasm are distributed to the appropriate regions of the developing organism, each controlling the differentiation of its own particular area. Some of this germ plasm, however, is not distributed in this fashion but remains as residual material which goes by the shortest route to the cells which are to form the sex organs of the new individual and there locates itself in the nuclei of the embryonic sex cells. Here it remains until at the time of sexual maturity, the cell containing it matures, unites in fertilization with the cell from the opposite sex, and the process is repeated. While in this dormant condition, this residual material necessarily must receive its nutrition from the surrounding body, but Weismann supposed that it is so effectually insulated from the latter as not to be affected in any qualitative fashion by any activities of the body itself or by any influence of the environment.

If this germ plasm is thus isolated and unchangeable and determines the character of the individuals of successive generations, why are not all individuals alike? Weismann refers the origin of variations to the maturation process of the sex cells in which each cell apparently shuffles its chromatin and discards a portion of it, before fertilization takes place. Since by the law of chances this discarding is different in any two cells, it follows that no two mature sex cells are exactly alike. Further variability is produced by the union of the dissimilar chromatin of the two sex cells in fertilization. While much that is new has been discovered concerning the phenomena of maturation and fertilization since Weismann wrote, nothing has appeared that seriously affects this much of his theory. His further development of hypotheses concerning the structure of the germ plasm and its behavior are not of so much importance at the present time (see bibliography at end of article).

The net results of Weismann's work are two. In the first place, there is agreement among all students of heredity that mutilations or their effects are not inherited, nor is there any reason to accept the validity of reported cases of maternal impressions and prenatal influences. In the second place, there is agreement that without necessarily accepting Weismann's ideas as to the composition of the germ plasm, it is necessary to assume the existence of such a substance as the determiner of hereditary qualities. The question as it now stands is this: Is it possible for this germ plasm, lying in the sex cells, to be affected by any activity of the body or by any influence of the environment so as to produce precise and permanently heritable



changes in the structure of subsequent generations?

Weismann at first claimed for germ plasma a complete insulation from external influences, but later modified this position. He found that certain insects when subjected to lowered temperature became darker in color and this modification was transmitted to subsequent generations. To explain cases of this sort where animals certainly responded to external changes, Weismann developed the theory that some environmental influences are strong enough to penetrate immediately through the body and act directly on the germ plasma, causing changes in it. These changes may be inherited. Only those agencies that are strong enough thus to penetrate may affect the germ plasma.

The Neo-Lamarckians on the other hand, who believe in the transmission of acquired characters, hold that lesser influences, either acting repeatedly, from without, on the body, or the results of the activity of the body itself, may gradually penetrate to, and affect, the germ plasma. Admitting that the mechanisms by which such an effect could operate are not clearly to be seen, they believe that some observations can be explained only on the assumption that this has taken place. Botanists are rather more apt to take this position than are zoologists, for in the animal body are found much fewer protoplasmic connections between the organs, and the sex cells are more definitely isolated than is the case in plants. In fact, it is sometimes difficult to imagine any very complete separation in plants because of the elaborate arrangement of intercommunicating protoplasmic connections. Among zoologists, the palaeontologists are most apt to be Neo-Lamarckians because the history of many structures seems to show a precise parallelism between the changes that these organs undergo in successive ages and the changes that would have been set up in them in each generation by the uses to which they must have been put.

It is evident that an apparent case of use inheritance might be explained equally well by either of the above hypotheses, and thus a condition of deadlock results.

Most of the earlier writers on this subject devoted their time mainly to arguing on what might be considered reasonable explanations of observed phenomena, and conclusive experimental evidence is lacking. Brown-Sequard, whose results were quoted by Darwin and by later writers, thought that certain injuries to the nervous system of guinea pigs would be followed by a condition of epilepsy and this was transmitted to descendants. This for a long time stood as a valid case of the inheritance of acquired characters, but the most recent work along this line indicates that the so-called "epileptic" state of the guinea pig appears under favorable conditions in the perfectly normal animal, and it seems certain that this case may be ruled out. Practically all of the supposed cases to demonstrate this point are either of doubtful accuracy, or are capable of two interpretations (see above) and clean-cut, precise evidence is lacking in favor of Neo-Lamarckism.

Most, if not all, biologists would agree that a decisive demonstration that external influences may produce heritable changes in germ plasma, would greatly simplify some of our problems of heredity, especially as related to evolution. For this reason, some recent investigations which

it appears may offer such demonstration have excited much interest. The first has to do with antibodies. If, for example, we inject human blood into the blood vessels of an unrelated animal, say a rabbit, the body of the rabbit will react in a definite and precise fashion, developing what is known as an antibody which has specific reactions to human blood. If the blood containing the antibody is mixed with human blood a precipitate will form, but if mixed with blood from any other animal (except a few of the higher apes) no reaction occurs. A similar formation of antibodies having a specific relation to whatever material was injected would follow from the injection of any other body tissue, or on the entrance of bacteria into the blood.

Guyer and Smith injected the material from a crushed lens from the eye of a rabbit into the blood of a fowl and in that way developed an anti-lens body in this blood. Some of this blood was injected into a pregnant rabbit at a time when the lenses of the embryos were forming, and a number of them were born with defective lenses. This defect persisted through several generations, being transmitted through the male as well as through the female and in a Mendelian fashion (see below). This would indicate that the defect was truly hereditary and not a case of infection from the mother in each generation, and leads to the conclusion that the germ plasma of the rabbit had been modified by the antibody. Guyer and Smith did not claim that their results are arguments in favor of Neo-Lamarckism, but others have so interpreted them, on the ground that if these antibodies can produce such an effect, other antibodies which conceivably may have arisen from time to time in the racial history, as reactions of the body to stimuli of various kinds, may have had corresponding effects on the germ plasma. A second line of argument is derived from the study of hormones, chemical substances formed in body cells and poured into the blood, which modify the structure of other organs. It is generally admitted that some secondary sex characters (for example those that distinguish the male from the female individual) are due to hormones formed by the respective developing sex organs. There is reason to think that hormones may be formed by any organ, and it is possible that a changed use of an organ may change the character of its hormones, and that this might react on the germ plasma.

More recent research has produced results that are even more suggestive in this connection. A number of investigators have found that treatment of animals with radium or with X-rays will produce structural changes, some of which rank as true mutations (See ZOOLOGY). Characteristic mutations appear in laboratory cultures of fruit flies; and at the December, 1927, meeting of the American Association for the Advancement of Science, the \$1000 prize annually given for the most noteworthy paper read at the meeting was awarded for a research on the effect of X-rays on fruit flies, where, after exposure to these rays, mutations similar to those that occur in laboratory cultures appeared, but 150 times as frequently. Since X-rays are found in ordinary light, it is perfectly possible that changes in their character or intensity may directly produce changes in germ plasma.

**Biometry.** An important technique for the study of heredity was developed by Galton and later by Pearson in biometry. This is an

Important practical suggestions arise from the study of sex-linked characters. It is evident from a study of the last two diagrams that it would be possible to determine which individuals would transmit the sex-linked character and which would not. If, as is true in some cases, the character is an undesirable one, it would be possible by controlling matings to eliminate the character from the race. On the other hand, if the sex-linked character is desirable, it would be possible so to control matings as to make it more common. It is evident from the diagram that, assuming absolute power to control matings, either color-blindness could be entirely eliminated, or a race could be developed all of whom would be color-blind, according to which was considered the desirable condition.

**Atavism or Reversion.** These terms should be considered as synonymous and refer to the appearance in one generation of characters not represented in the immediate parents but present in some more remote ancestors. In the case just mentioned, color-blindness skips a generation and might even seem to skip more than one, if in the intermediate generations the individual who would show it did not happen to appear. Another familiar case is where the child of brown-eyed parents has blue eyes inherited from a blue-eyed grandparent or earlier ancestor. In eye color, the pigmented (brown or black) eye is dominant to the non-pigmented (blue or albino). If, therefore, the brown-eyed parents happen to be heterozygous for brown, having the blue as a recessive character, one-quarter of their children would be homozygous for blue and be blue-eyed (see diagram above, referring to the guinea pig which, making the necessary changes in the symbols, would apply as well to this case). Since the number of individuals is so small in any human family, it might happen that several generations would elapse before the homozygous individual appears and thus the child seem to inherit something not possessed by its parents. This emergence of a previously hidden recessive character explains one type of atavism.

Another type has a different explanation. Bateson described a case where two white sweet peas when crossed gave a purple  $F_1$  and this when inbred gave in  $F_2$  nine purple to seven white. This purple color was present in the ancestral Sicilian sweet pea, so that this was an undoubted case of atavism. This can be explained on the assumption that for the production of the purple color the coöperation of two genes is necessary. If either gene is present alone, no color appears; when they are both present they produce the purple color. In the history of these two varieties of sweet peas, it happened that these two genes became separated and thus two lines of white-flowered plants arose, one carrying one of the genes, the other carrying the other. When they were crossed, color returned. Assuming that one of these genes is represented by  $C$  with an allelomorph  $c$  and the other by  $R$  with  $r$  as allelomorph, the composition of one plant would be  $Cr$  and the other  $cR$ . When crossed, this becomes  $CRor$  and color appears. Assuming that this is the case, the hybrid would form gametes  $CR$ ,  $Cr$ ,  $cR$ ,  $cr$ . Representing the result of crossing by a diagram, we have the results shown in the next column.

Nine of these squares contain both  $C$  and  $R$ , while none of the other seven has both of them. Accordingly, nine are colored and seven white,

		Ova			
		$CR$	$Cr$	$cR$	$cr$
Spermatozoa	$CR$	$CR$ $CR$	$Cr$ $CR$	$cR$ $CR$	$cr$ $CR$
	$Cr$	$CR$ $Cr$	$Cr$ $Cr$	$cR$ $Cr$	$cr$ $Cr$
	$cR$	$CR$ $cR$	$Cr$ $cR$	$cR$ $cR$	$cr$ $cR$
	$cr$	$CR$ $cr$	$Cr$ $cr$	$cR$ $cr$	$cr$ $cr$

as actual observation showed. Again, theoretical expectation and observations are in agreement and demonstrate the accuracy of the theory.

**Inbreeding.** This is regarded, and with some experimental evidence in favor of the belief, as undesirable in that it tends to produce weakened or degenerate descendants. Many plants, however, as wheat, rice, barley, oats, tobacco, and beans, are normally self-fertilizing and experiments on white rats have shown that no injurious effects follow in the closest inbreeding. It now seems certain that inbreeding in itself is not injurious, but that, if there are in a family undesirable recessive traits, these traits are more apt to become homozygous and thus visible if two members of this family mate than if either mates with a more distantly related individual. If a family is free from these undesirable recessives, no harmful effects follow inbreeding. On the other hand, "outbreeding," or mating of unrelated individuals, is sometimes followed by an increase in vigor, apparently because it results in a combination of several desirable dominant characters.

The most elaborate experiments ever made in heredity were made by Morgan and his associates on the fruit-fly, *Drosophila*, which is ideal for this purpose as it breeds rapidly and is easily kept under observation. As a result of these experiments, they have not only identified a large number of genes but have demonstrated the exact location of each of these genes on the chromosome (consult bibliography).

Of much interest is the question as to the number and character of these genes. To assume that there is in the sex cell a gene for each different character of the adult would be to assume an inconceivable complexity in the germ plasm. Moreover, it is known that sometimes one gene may affect more than one body character or, on the other hand, several genes may coöperate to determine one character. It would be possible, therefore, to explain their action by the assumption of a comparatively few genes which, reacting on the original material of the fertilized egg, start the process of differentiation, then by a second reaction on this primary differentiated material set up a further differentiation, and this series of actions and reactions continue to the end, the process being more or less modified by the reactions of one set of genes upon the others. That the genes are complex chemical compounds, possibly of the nature of enzymes, acting upon the protoplasm of the body seems a reasonable assumption from what we know of their mode of working.

It seems certain, however, that the cytoplasm of the egg plays some part in heredity and is not merely an inert mass, molded by the genes in the chromosomes. Apparently, the general characteristics, e.g., whether an egg shall develop into a dog or a horse, are determined by the cytoplasm while the individual characteristics are controlled by the genes.

If genes are chemical compounds of the nature of enzymes, it should be possible to modify their structure by chemical or other means and there is experimental evidence that this can be done. If the cases mentioned earlier, where external forces have permanently modified the race, are valid, the genes must have been modified. Mutations also (see ZOOLOGY) must owe their origin to changes in the composition of the genes.

This work in heredity has decidedly modified opinion on one point which had seemed so obvious as to be axiomatic. This was the principle which underlay all of Darwin's work on selection, that of the supposed efficiency of the selection of individual variations. Among the members of any generation are always found variations in the degree of development of any one character. Darwin supposed, and this has generally been believed until quite recently, that if extreme variates were isolated from the remainder and allowed to breed, some of their offspring would vary still more widely in this direction and if this process were continued almost any amount of variability could be obtained. If this were true, it would mean that the character of genes could be changed by the act of selection, but the evidence indicates that it is probably not true.

In any species, the range of variability is fixed, and selection of the greatest or the smallest variate from the mean of the species would not in any way affect the range of variability of the next generation. Where the selective process seems to be sufficient, it may mean either that the original group was not homogeneous and selection has isolated different races from one another, each having its own range of variability, or that there were genes modifying or interfering with the action of the genes under consideration and the selective process has removed these, thus allowing the original gene free expression. The gene is apparently not modified through selection.

As a result of his study of biometry, Galton decided that inheritance is blending, i.e., that the offspring of two parents unlike in any particular character would be, with respect to that character, intermediate between the parents. If this were true, it would mean that the genes from the two parents had modified one another. The Mendelian interpretation is that in such a case the apparent blending is due to the peculiar action of two or more genes. For example, a brown-chaffed and a white-chaffed wheat were crossed and  $F_1$  was brown.  $F_2$ , however, did not have brown and white in the proportions of three to one, as might have been expected, but there were fifteen brown to one white and the browns were not all of the same shade. This can be explained on the assumption that there are two genes for brown,  $B$  and  $B_1$ , each capable of producing the color, but  $BB_1$  gives a more intense shade than either  $B$  or  $B_1$  alone. Worked out on the checker-board type of diagram, this theoretical expectation agrees closely with actual observations and there is no evidence for a true blending due to modifications in the character of the original genes.

By offering precise information concerning the results to be expected from any given mating, Mendelism has been of service to practical plant and animal breeders, and these services will undoubtedly be extended with advancing information. In human heredity, because of the obvious impossibility of experimental matings and because of the small size of human families, accurate information is more difficult to obtain, but enough is known to offer to eugenics much valuable assistance in its efforts to improve human qualities. This is especially true in the cases of a number of diseases which are sex linked in inheritance and which, by applying the rules mentioned above, might easily be eliminated from the race. See EUGENICS.

**Bibliography.** The following books summarize the more important works in this field: Darwin, *Animals and Plants under Domestication*; Spencer, *Principles of Biology*; Galton, *Natural Inheritance*; Thomson, *Heredity*; Cunningham, *Hormones and Heredity*; Pearl, *Modes of Research in Genetics*; Castle, *Genetics and Eugenics*; East and Jones, *Inbreeding and Outbreeding*; Morgan, Sturtevant, Muller, and Bridges, *The Mechanism of Mendelian Heredity*; Weismann, *The Germ Plasm*; Shull, *Heredity*; Sinnott and Dunn, *Principles of Genetics*.

**HERELLE, FELIX H.** See D'HERELLE.

**HERFORD, HERFORD or HÄRFORD, CHARLES HAROLD** (1853- ). An English scholar (see VOL. XI), fellow of the British Academy of honorary professor of English literature at the University of Manchester. His later publications include: *Goethe* (1913); *Memoir of Julia Wedgwood* (1915); *Is There a Poetic View of the World?* (1916); *Shakespeare's Treatment of Love and Marriage, and other Essays* (1921); *Sketch of Shakespeare Investigation, 1893-1923* (1923); and *The Post-War Mind of Germany* (1926). He wrote for various papers and edited the *Warwick Library and Shakespeare*, and the critical section of the *Belles Lettres Series*.

**HERGESHEIMER, JOSEPH** (1880- ). An American author, born at Philadelphia, Pa. He studied painting for a time, but soon turned to literature. His first novel, *The Lay Anthony*, which was not published until 1914, was at once acclaimed as a work of the first importance. There followed in rapid succession a series of notable books, including: *Mountain Blood* (1915); *The Three Black Pennys* (1917); *Java Head* (1919); *Linda Condon* (1919); *Cytherea* (1921); *The Bright Shawl* (1922); and the collected short stories *Gold and Iron* (1918); *The Happy End* (1919); *The Presbyterian Child* (1923); *Balsand* (1924); *From an Old House* (1925); *Tampico* (1926); *Quiet Cities* (1928). Possessed of a luxurious style that is peculiarly effective for his subjects, with a feeling for exotic backgrounds that he has, nevertheless, been able to render subordinate to the essential work of character delineation, Mr. Hergesheimer, in *The Lay Anthony*, in *Linda Condon*, in the first parts of *The Three Black Pennys* and *Java Head*, has written fiction little surpassed or even equaled in the period.

**HERMANN, HERMAN, GEORGE** (pseudonym for GEORG HERMANN BOEHARDT) (1871- ). A German novelist. He made old Berlin the background of most of his stories, which include *Spielkinder* (1897); *Die Zukunftsfröhen* (1898); *Aus dem letzten Hause* (1899); *Jettchen Gebert* (1906); *Henriette Jacoby* (1907); *Aus guter alter Zeit* (1913); *Heinrich Schön, Jr.* (1915);

Von gesicherten und ungesicherten Leben (1915); *Einen Sommer lang* (1917); *Schnee* (1921); *Der doppelte Spiegel*, and *Tränen um Modesta Zamboni* (1927). His plays include: *Jettchen Gebert*; *Henriette Jacoby*; *Mein Nachbar Ameise* (1920); *Die Nacht des Dr. Herzfeld* (1922); and *Frau Antonie* (1925). He is also the author of several volumes of sketches: *Randbemerkungen*; *Kleine Erlebnisse* (1920); *Spaziergang in Potsdam* (1926); and *Holland, Rembrandt, Amsterdam* (1926).

**HERMANNSSON, HALDÖR** (1878- ). An Iceland philologist born at Völlum, Iceland. He entered the University of Reykjavik in 1898 and three years later that of Copenhagen. In 1905 he was appointed curator of the Fiske Icelandic Collection at Cornell University Library and taught Scandinavian languages at the university, becoming a full professor in 1924. His many works include *The Northmen in America* (1909); *The Ancient Laws of Norway and Iceland* (1911); *Icelandic Authors of To-day* (1913); *Icelandic Books of the 16th Century* (1916); *The Periodical Literature of Iceland* (1918); *Modern Icelandic* (1919); *Bibliography of the Eddas* (1920); *Icelandic Books of the 17th Century* (1922); *Jon Gudmundsson and His Natural History of Iceland* (1924); *Eggert Olafsson* (1925), and *Two Cartographers* (1926). He compiled a *Catalogue of the Fiske Icelandic Collection* (1914, 27) and of *Runic Literature* (1918), and edited *The Story of Griselde in Icelandic* (1914) and *An Icelandic Satire: Lof Lyginnar* (1915).

**HERMANT, ABEL** (1862- ). A French man of letters, born in Paris, and educated at the lycées Bonaparte and Condorcet. He devoted himself to journalism and to literature, writing critical essays, novels, and theatrical comedies. In all his works, he displayed a keen sense for satire and social caricature. One of his novels, *La Carrière* (1894), dealt ironically with the diplomatic "career," and it is this that was supposed to have delayed Hermant's election to the French Academy until 1927. His works include: *Monsieur Rabosson* (1884); *Nathalie Madoré* (1888); *Amour de tête* (1890); *Le disciple aimé* (1895); *Les transatlantiques* (1897); *Trains de luze* (1908); *Heures de guerre de la famille Valadier* (1915); *Chroniques françaises, 1914-1915* (1916); *Histoire amoureuse de Fanfan* (1917); *La vie à Paris* (1919); *Le roman de Loup* (1925); *La marionnette*; "Secondes Classes" (1920); *Les épaves* (1927); *Camille aux cheveux courts* (1927); also stories of court life: *La carrière* (1894); *Le sceptre* (1897), and *Le char de l'État* (1899); a series of reminiscences, including *Les confidences d'une aïeulle* (1893); *Souvenirs du vicomte de Courpière* (1901); *L'aube ardente* (1919); *La journée brève* (1920); and *Crépuscule tragique* (1922). He also wrote *Le joyeux gargon* (1913); *Le caravansérail* (1917); *Le rival inconnu* (1918); *La petite femme* (1921); *L'autre aventure du joyeux gargon* (1921); and the short stories: *Cœurs à part*, *Cœurs privilégiés*, and *Daniel* (1910); and numerous essays and dramas. Consult *Abel Hermant*, by Peltier (1924).

**HERRE, PAUL** (1876- ). A German historian, who in 1920 became director of the political-historical archives at Potsdam. He was born at Magdeburg, studied at the universities of Berlin, Jena, and Leipzig, and in pursuit of a commercial enterprise traveled in Germany, Austria, Italy, and Spain. He was lecturer at

the University of Leipzig (1906-20). He is the author of: *Preussens Befreiungs- und Verfassungskampf* (1914); *Spanien und der Weltkrieg* (1915); *Weltpolitik, Weltkatastrophe* (1916); *Geschichtliche Schlaglichter auf den Weltkrieg* (1916); *Aufruf an die Neutralen zur Geduld* (1918); *Bismarcks Staatskunst* (1916); *Völkergemeinschaftsidee und Internationale Politik* (1920); *Weltgeschichte der neuesten Zeit* (1920); and *Die südtiroler Frage* (1927).

**HERRICK, MYRON T.** (1854-1929). An American diplomat (see Vol. XI). During the World War, he established the American Ambulance Hospital at Neuilly, France, and was chairman of the War Camp Community Service and of the Mayor's War Relief Committee in Cleveland. Reappointed Ambassador to France by President Harding in April, 1921, he served with conspicuous success until his sudden death on Mar. 31, 1929. At Paris, he was entrusted with difficult negotiations involving war debts, limitation of armaments, and the Kellogg-Briand multilateral peace pact. His handling of Colonel Charles E. Lindbergh's arrival in Paris following the latter's transatlantic flight was widely praised. It was largely due to his efforts that adequate quarters for the American Embassy in Paris were provided for in August, 1928. During the post-war reconstruction period, he also served as chairman of the American Commission for Devastated France. Following services in Paris, his body was returned to America on a French warship, with full military honors such as were never before accorded a foreign Ambassador. Burial was in Cleveland.

**HERRICK, ROBERT** (1868- ). An American writer and university professor (see Vol. XI). His professorship of English at the University of Chicago ended in 1923. His later books include *His Great Adventure* (1913); *Clark's Field* (1914); *The World Decision* (1916); *The Conscript Mother* (1916); *Homely Lilla* (1923); *Waste* (1924); *Wanderings* (1925); and *Chimes* (1926). He was a member of the National Institute of Arts and Letters.

**HERRIOT, EDOUARD** (1872- ). A French public official and man of letters who was educated at the École Normale Supérieure, and at the conclusion of his studies became a professor of rhetoric and literature at the Lycée of Lyons, and an instructor at the university there. He entered politics and was successively counselor general of the Rhone, Mayor of Lyons, Senator (1912), Minister of Public Works in Briand's government (December, 1916 to March, 1917) and deputy (November 1919). After the Armistice, he opposed the reparation policies of the Nationalist groups in France and favored a rapprochement with Germany and Russia. In 1922 he made a visit to Russia which he described in *La Russie Nouvelle*. He was president of the Federation of Radical and Radical Socialist parties, and was one of the leaders of the Parliamentary opposition to the *bloc national*. The elections of May, 1924, led to his premiership, supported by parties of the left bloc, from June of that year to April of the following. His policy was conciliatory toward Germany, favoring the Dawes Plan and allowing German vessels to enter French ports for the first time since the World War, and he recognized Soviet Russia (Oct. 28, 1924). He stood strongly against inflation, so when it was discovered that the Government had secretly resorted to it, the ministry was forced to resign. Painlevé, the President

of the Chamber, became Premier, and Herriot was chosen President in his place; on July 20, 1926, he left the speaker's chair to overthrow the Briand-Caillaux government. He again formed his own cabinet which was defeated on its first appearance before the Chamber, and then gave way to Poincaré, in whose government he became Minister of Public Instruction (July 23, 1926-). In October of that year, he resigned his presidency of the Federation of the Radical and Radical Socialist parties.

As a man of letters, Herriot was best known by a work on *Philon le juif* and the Jewish-Alexandrian school of philosophy which was crowned by the Academy of Moral and Political Science in 1897. His other works include: *Un Ouvrage Inédit de Mme. de Staël* (1904); *Précis d'histoire des lettres françaises* (1905); *Agir* (1915-16); *Créer* (1919); *Lyon pendant la guerre* (1924); and *Dans la forêt normande* (1926).

**HERRMANN**, hër'mân, CONRAD EDMUND GUSTAV (1871-). A German writer. He was born at Leipzig and attended the university there. He is the author of the plays: *Savonarola* (1886); *Sensation* (1906); *Der Triumph des Mannes* (1906); *Der grosse Baal* (1907). Other works include *Vineta*, a volume of verse (1908); *Und doch* (1915); *Sakuska*, a Russian story (1919); *Lebensfahrt* (1919); *Wilhelm Busch an der Himmelstür* (1920); *Gesichte und Grimassen* (1920); *Der lachende Olymp* (1921); *Maulwürfe* (1921); the satire *Der Affenspiegel* (1923); an edition of *1001 Nacht* (*Arabian Nights*) (1928).

**HERSHEY**, AMOS SHARTLE (1867-). An American educator (see VOL. XI). He became head of the newly created department of political science at the University of Indiana in 1914. Among his later writings were *Modern Japan*, with Frank M. Anderson (1919); *Handbook for the Diplomatic Relations of Europe, Asia, and Africa, 1870-1914* (1918) and *The Essentials of International Law and Organization* (1927). He was a member of the staff of the American Commission to Negotiate Peace, 1918-19.

**HERTER**, ALBERT (1871-). An American painter and craftsman (see VOL. XI). Among his later mural works were a series for the Supreme Court room of the Wisconsin Capitol, and an allegorical pageant in the St. Francis Hotel, San Francisco. At his Herter Looms, he designed and produced artistic tapestries.

**HEBTLING**, GEORG, BARON VON (1843-1919). A German administrator and Catholic philosopher (see VOL. XI). On Nov. 1, 1917, he was appointed Chancellor by the Kaiser, and by his skill brought some measure of stability into the affairs of the German government. Later, when Bulgaria capitulated at the end of September, 1918, he was driven from office. See GERMANY, under *History*.

**HERTWIG**, hër'tvîk, RICHARD VON (1850-). A German zoölogist (see VOL. XI). He resigned his professorship at Munich in 1925 and in 1929 visited the United States, where he was elected a foreign associate of the National Academy of Sciences. He wrote *Abstammungslehre und neuere Biologie* (1927).

**HERTY**, CHARLES HOLMES (1867-). An American chemist, born at Milledgeville, Ga., and educated at the University of Georgia (1886), Johns Hopkins (Ph.D., 1900), Berlin,

and Zurich. He was assistant chemist of the Georgia Experiment Station (1890-91), adjunct professor of chemistry at Johns Hopkins (1894-1901), and from 1901 to 1904, was with the Bureau of Forestry in the United States Department of Agriculture. During 1905-16, he was professor of chemistry at the University of North Carolina. He was the editor of the *Journal of Industrial and Engineering Chemistry*, 1917-21, president of the Synthetic Organic Chemical Manufacturers' Association, 1921-26, and adviser to the Chemical Foundation, Inc., after 1926. His principal researches have been in organic chemistry and include the determination of the constitution of inorganic compounds by physico methods; also, he invented a new method of turpentine orcharding and a rapid method for the determination of oil in cottonseed products.

**HERTZ**, ALFRED (1872-). A distinguished German conductor (see VOL. XI). In 1915 he resigned his position at the Metropolitan Opera House and accepted the conductorship of the San Francisco Symphony Orchestra, which under him soon developed into one of the great orchestras of the country. He was largely instrumental in winning recognition for the native composer. While at the Metropolitan, he produced all the operas by American composers produced there. In 1929 he resigned as conductor of the San Francisco Symphony Orchestra.

**HERTZOG**, hër'tsôg, HON. J. B. M. (1866-). A South African Prime Minister and general (see VOL. XI). At the outbreak of the South African rebellion against Great Britain in 1914, he refused to take part on either side. After the World War, as leader of the Nationalist Party, he headed the opposition of the government of General Smuts, and, on the defeat of the Smuts ministry early in 1924, became Prime Minister and Minister for Native Affairs.

**HERTZSPRUNG**, EJNAR (1873-). A Danish astrophysicist, born near Copenhagen, who was successively a professor in Göttingen University, in the observatory at Potsdam, director (1919) of the Leyden Observatory, and professor in the University of Leyden (1920-). In 1912 he worked at the Mount Wilson Observatory in California for four months. He has published much on astrophysics.

**HERZOG**, ÉMILE, SEE MAUROIS, ANDRÉ.

**HERZOG**, RUDOLF (1869-). A German novelist and poet (see VOL. XI). In the first two years of the World War, he abandoned fiction and wrote the following volumes of verse: *Ritter, Tod, und Teufel* (1915); *Von Stürmen, Sterben, Auferstehen* (1916); and the dramatic poem *Stromübergang* (1916). He later wrote: *Die Stollenkamps und ihre Frauen*, a novel (1917); *Jungbrunnen*, a volume of stories (1918) *Germaniens Götter*, a book of German myths (1919); *Die Buben der Frau Otterberg*, a novel (1921); a volume of poems, *Windzeit und Wolfszeit* (1919); and the novels *Wieland der Schmied* (1927), and *Das Fährlein der Versprengten* (1927).

**HESS**, ALFRED FABIAN (1875-). An American pediatricist known for his original researches into affections of childhood, notably rickets, scurvy, tuberculosis, blood states, and affections of the stomach and intestines. Born in New York City, he was educated at Harvard and at Columbia, receiving his medical degree from the College of Physicians and Surgeons in 1901. After studying pediatrics in Europe, he was made a professor of that chair in the Uni-



versity-Bellevue Medical College, New York City, in 1915. The record of his work in pediatrics and experimental pathology is contained in 70 or more papers published in periodical literature. A large share of credit for discoveries in connection with rickets, vitamin D, and effects of ultra-violet radiation on rickets and on food substances was accorded to Prof. Hess and in 1927 the Franklin Society awarded him the John Scott Medal for "producing a vitamin factor in food by ultra-violet light."

**HESS, HES, MYRA** (1890- ). An English pianist, born in London. At the age of five, she began to study the piano and two years later entered the Guildhall School of Music, where she graduated as winner of the gold medal. After further study under Tobias Matthay, she made her debut in London, in January, 1908, winning immediate success. She then made tours of Holland and France. Upon her American debut (New York, Jan. 24, 1922) she became a prime favorite in the United States, not only as soloist, but also as a fine ensemble player.

**HESS, VICTOR** (1853- ). An Austrian professor of physics at the University of Graz and contributor on radioactivity, atmosphere electricity, and kindred subjects to the publications of the Academy of Science in Vienna. From 1921 to 1923, he was director of the research laboratory of the U. S. Radium Corporation in New York, and from 1922 to 1925 consulting physicist in the U. S. Bureau of Mines, Washington. Since his return to Austria, he has published *Die elektrischen Leitfähigkeit der Atmosphäre und ihre Ursachen* (1926, in English translation: *The Electrical Conductivity of the Atmosphere and its Causes*, 1928).

**HESE, HESSE, HERMANN** (1877- ). A German novelist and poet (see VOL. XI). He took up his residence in Switzerland before the World War. His later works include: *Rosshalde* (1914); *In der alten Sonne* (1914); *Musik des Einsamen* (1915); *Knulp* (1915); *Am Weg* (1916); *Briefe ins Feld* (1916); *Schön ist die Jugend* (1916); *Marchen* (1919); *Kleiner Garten* (1919); *Klingsors letzter Sommer* (1920); *Zarathustras Wiederkehr* (1920); *Blick ins Chaos* (1920); *Wanderung* (1921); a poem of India, *Siddharta* (1922); a selection from previous books of verse, *Ausgewählte Gedichte* (1922), a poetical volume, *Italien* (1923); and the novels *Demian*, *Sinclair's Notizbuch*, and *Der Steppenwolf* (1927).

**HETERODYNE.** See RADIO TELEGRAPHY.

**HEWLETT, MAURICE HENRY** (1861-1923). An English novelist (see VOL. XI). His later books include: *A Lover's Tale* (1915); *The Little Iliad* (1915); *The Song of the Plow* (1916); *Thorgrils of Treadholt* (1917); *Peridore and Paravail* (1917); *The Village Wife's Lament* (1918); *Flowers in the Grass*, poems (1920); *In a Green Shade* (1920); *Wiltshire Essays* (1921); *Contemporary Essays* (1922); *Last Essays* (1924); and *The Letters of Maurice Hewlett; to Which is Added a Diary in Greece, 1914*, edited by Laurence Binyon (1926).

**HEYCK, EDUARD** (1862- ). A German historian, who was born at Doberan and studied at Leipzig, Jena, and Heidelberg. He was professor at the universities of Freiburg and Heidelberg, and librarian at Donaueschingen. Included among his later works are *Die Kreuzzuge und das Heilige Land* (1900); *Frauenschönheit im Wandel von Geschmack und Kunst* (1903); *Wilhelm von Oranien* (1908); *Florenz und die*

*Medici* (1909); *Das Deutschland von Morgen* (1917); *Parlament und Volksvertretung* (1918); and *Hohenfeuer* (1920).

**HEYMANN, LILA GUSTAVA** (1868- ). A German social worker, born in Hamburg. She engaged in propaganda for the abolition of the *Sittenpolizei*, worked for child protection and was active in municipal and communal reforms in Munich. She also wrote works about the sex problem and hygiene for young people. After 1918 she was co-editor, with Anita Augspurg, of the magazine *Die Frau im Staat*.

**HEYWARD, DUBOSE** (1885- ). An American writer. He was born at Charleston, S. C., and obtained his schooling there. He wrote: *Skylines and Horizons* (1924); *Porgy* (1925); *Angel* (1926); and *Mamba's Daughters* (1928), and was co-author (with Hervey Allen) of *Carolina Chansons* (1922). *Porgy* was dramatized in collaboration with Dorothy Heyward and produced by the Theatre Guild of New York in 1927-28.

**HIBBARD, BENJAMIN HORACE** (1870- ). An American agricultural economist, born in Bremer County, Iowa. He graduated from the Iowa State College of Agriculture and Mechanic Arts in 1898, and took post-graduate courses at the University of Wisconsin and in Germany. In 1910 he was special agent in the agricultural division of the Bureau of the Census, and in 1913 was appointed professor of agricultural economics at the University of Wisconsin. In 1919 Professor Hibbard became head of this department. He was a member of several societies and wrote *Effect of the Great War on Agriculture* (1919); *Marketing Agricultural Products* (1921); and *A History of the Public Land Policies* (1924).

**HIBBEN, JOHN GRIER** (1861- ). An American clergyman and educator, elected president of Princeton University, 1912. (See VOL. XI). For his services during the World War he was made an officer of the Legion of Honor (France), a commander of the Order of the Crown (Belgium), and a grand officer of the Order of St. Sava (Serbia). He added to his list of publications *The Higher Patriotism* (1915).

**HIBBEN, PAXTON** (1880-1928). An American war correspondent and publicist, born at Indianapolis, Ind. He graduated from Princeton University in 1903 and studied law at Harvard. In 1906 he was admitted to the bar. Entering the diplomatic service, he served as Secretary of Legation in the capitals of Russia, Mexico, Colombia, Holland, and Chile, retiring from the service in 1912. He acted as war correspondent in Europe for several newspapers and magazines from 1915 to 1917, and in 1921 was secretary of the Russian Commission of Near East Relief. During the World War, he served as first lieutenant of field artillery and also with the Finance Bureau, and in the office of the Inspector General. In 1919 he was on duty with the military mission to Armenia and was staff correspondent for the *Chicago Tribune* from 1919 to 1920. He wrote *Constantine I and the Greek People* (1920); *The Famine in Russia* (1922); and *Henry Ward Beecher—an American Portrait* (1927); and contributed many articles on subjects relating to the Near East to magazines.

**HICHENS, ROBERT SMYTHE** (1864- ). An English novelist and journalist (see VOL. XI) who was made a fellow of the Royal Society of Literature in 1926. Among his later books are *In the Wilderness* (1917); *Snake-*

*Bite* (1919); *Mrs. Marden* (1919); *The Spirit of the Time* (1921); *The Last Time* (1922); *December Love* (1923); *After the Verdict* (1924); and *The God Within Him* (1926). The New York play, *Business is Business*, was his adaptation of *Les affaires sont les affaires*, and he wrote *The Voice from the Minaret* produced in 1919. In 1920 his novel *The Garden of Allah* was played in New York and London.

**HICKS, FREDERICK CHARLES** (1863- ). An American economist and university president, born at Capac, Mich. He was graduated from the University of Michigan in 1886, where in 1890 he also received his Ph.D. During 1891-92 he was instructor in economics at the University of Michigan, and then for eight years was professor of history and political economy at the University of Missouri. In 1900 he accepted the chair of economy and commerce at the University of Cincinnati. He became president of the latter institution in 1920. In addition to many technical papers, reports, and monographs, he is the author of *Lectures on the Theory of Economics* (1901) and *Competitive and Monopoly Price* (1911).

**HICKS, FREDERICK CHARLES** (1875- ). An American librarian, born at Auburn, N. Y. He graduated from Colgate University in 1898 and from the Georgetown Law School in 1901. After several years spent in practicing law, he was appointed librarian at the United States Naval War College at Newport, serving from 1905 to 1908. In 1908-09, he was assistant librarian of the Brooklyn Public Library and was assistant librarian (1911-15), law librarian (1915- ), and associate professor of legal bibliography (1921- ) at Columbia University. He wrote *New World Order* (1920); *Men and Books Famous in the Law* (1921); *Materials and Methods of Legal Research* (1923); and *Human Jettison* (1927); and edited several historical series, including *Famous American Jury Speeches* (1925); and *Arguments and Addresses of Joseph Hodges Choate* (1926).

**HIDES.** See LEATHER; LIVE STOCK.

**HIGGINS, EDWARD JOHN** (1862- ). An English Salvation Army worker who became general of the organization in 1929. He was born at Highbridge, Somerset, educated at Dr. Morgan's School, Bridgewater, entered the Salvation Army as an officer in 1882, and by 1896 had become chief secretary in the United States. In 1905 he was appointed assistant foreign secretary at the London headquarters; from 1911 to 1919, he was commissioner for field work in Great Britain and Ireland, and from that year until 1929, he was chief of the staff of the Salvation Army. As general, he succeeded W. Bramwell Booth. In 1920 he was made Commander of the Order of the British Empire.

**HIGGINS, WILLIAM VICTOR** (1884- ). An American painter and teacher, born at Shelbyville, Ind. He studied at the Art Institute in Chicago and at the Academy of Fine Arts there. In Paris, he was a pupil of René Menard and Lucien Simon, and in Munich, of Hans von Hyeck. Among his pictures in permanent exhibitions are his "Moorland Gorse and Bracken," in the Municipal Gallery, Chicago; "Moorland Piper," Terre Haute Art Association; "Juanito, the Suspicious Cat," in the Union League Club, Chicago; "Women of Taos," Santa Fé Railroad; "A Shrine to St. Anthony," in the collection of the Des Moines Association of Fine Arts; "Fiesta Day," at the Butler Art Institute, Youngstown,

Ohio; "Pueblo of Taos" and "Indian at Stream" in the Los Angeles Museum. Examples of his murals are found in the decorations of the Englewood Theatre, Chicago. He won the first Logan Medal and the first Altman Prize of the National Academy of Design in 1918. He became an associate of the National Academy in 1921.

**HIGGS, HENRY** (1864- ). An English economist and administrator (see Vol. XI). He retired from his position of principal clerk in H. M. Treasury (1921). He was Newmarch Lecturer in statistics (1892, 1893, 1916-18, and 1923-26) in University College, London. His later writings include: *Financial System of The United Kingdom* (1914); *National Economy* (1917); *A Primer of National Finance* (1919); and *Financial Reform* (1925). He edited *Palgrave's Dictionary of Political Economy* (1923-26).

**HIGH PRESSURE BOILERS.** See BOILERS.

**HIGH SCHOOLS.** See EDUCATION IN THE UNITED STATES.

**HIGHWAYS.** See ROADS AND PAVEMENTS; BRIDGES.

**HILDEBRAND, hil'de-bränt, ADOLF E. R.** (1847-1921). A German sculptor (see Vol. XI). Among his later works, the most important was the Hubertus Fountain at the National Museum in Munich (1921). At the time of his death, he had finished the model for a monumental fountain for Cologne, with Father Rhine as the central figure.

**HILDEBRAND, JOEL HENRY** (1881- ). An American chemist, born at Camden, N. J. He was graduated from the University of Pennsylvania in 1903, took his Ph.D. there in 1906, then studied for a year in Berlin. During 1904-05 he was assistant, and during 1907-13 an instructor, in chemistry at the University of Pennsylvania, after which he accepted a call to the University of California, where, since 1918, he has been professor of chemistry and in 1923-26 dean of men. Physical chemistry, and such topics as electro-analysis, hydrogen electrodes, vapor pressures of metals and amalgams, dissociation of alcohol, and theories of solubility are among those on which he has published the results of his studies. During the World War, he served as director of the laboratory of the Chemical Warfare Service in France with the rank of major and later commanded the gas defense school as lieutenant colonel. In 1929 he was elected a member of the National Academy of Sciences. He is the author of *Principles of Chemistry* (1917) and *Solubility* (1924).

**HILFERDING, hil'fēr-dīng, RUDOLF** (1877- ). A German economist and public official (see Vol. XI). A member of the Social-Democratic Party, he opposed the Government's policies during the World War. He was editor-in-chief of *Freiheit* (1918-22), Minister of Finance in the first Stresemann cabinet (1923), a member of the Reichstag (1924- ), and again Minister of Finance in the Stresemann cabinet formed in June, 1928. In 1924 he founded and became editor of *Die Gesellschaft*, an international review of Socialism and politics.

**HILL, ALBERT ROSS** (1869- ). An American university president (see Vol. XI). From 1908 to 1922, he was president of the University of Missouri. During the World War, he was on a leave of absence until 1922 as director of foreign operations of the American Red Cross. Since 1923 he has been general

manager of the Ward Investment Company of Kansas City, Mo. From 1917 to 1921 he was a member of the board of the United States Naval Academy.

**HILL, ARCHIBALD VIVIAN** (1886- ). A British physiologist. He was educated at Blundell's School, Tiverton, and Trinity College, Cambridge, where he was a fellow (1910-16). He was H. O. Jones University Lecturer in physical chemistry (1914), a fellow of King's College (1916-25), becoming honorary fellow in 1927, and University Lecturer in physiology (1919-20). He then was professor of physiology at Manchester University (1919-23), and at University College, London (1923-25), and Foulerton Research Professor of the Royal Society (1926- ). From 1910 he investigated the production of lactic acid by exercising muscles, this study resulting, in 1922, in his sharing the Nobel Prize for medicine and physiology with Otto Meyerhoff, of the Kaiser Wilhelm Institute, Berlin, a friend engaged in the same field of research. He was Oliver Sharpey Lecturer, Royal College of Physicians (1924), Herter Lecturer, Baltimore (1924), Croonian Lecturer, Royal Society (1926); Lowell Lecturer, Boston (1927), and non-resident lecturer, Cornell (1927). He was made an Officer of the Order of the British Empire. He wrote *Muscular Activity* (1925); *Lectures on Certain Aspects of Biochemistry* (1926); *Living Machinery* (1927); and *Muscular Movement in Man* (1927).

**HILL, DAVID JAYNE** (1850- ). An American diplomat and writer (see Vol. XI). His later writings include: *The People's Government* (1915); *Americanism—What It Is* (1916); *The Rebuilding of Europe* (1917); *Impressions of the Kaiser* (1918); *Present Problems in Foreign Policy* (1919); *American World Policies* (1920); *The Problem of a World Court* (1927). He was for some years president of the National Association for Constitutional Government.

**HILL, EDWARD BURLINGAME** (1872- ). An American composer, born at Cambridge, Mass. After completing, with highest honors, all the courses in music under J. K. Paine at Harvard University, he continued his studies in Boston with B. J. Lang (piano) and F. F. Bulard (composition), and in New York with A. Whiting (piano) and H. E. Parkhurst (theory). In 1908 he was appointed instructor in music at Harvard and in 1918 was made associate professor. He lectured extensively on modern French music, both in the United States and in France, and was also a frequent contributor to various periodicals. As a composer, he began as an impressionist, but soon drifted into futurism, and finally into plain jazz. His works include: two pantomimes, *Jack Frost in Midsummer* and *Pan and the Star*; two symphonic poems, *The Parting of Lancelot and Guinevere* and *The Fall of the House of Usher*; two orchestral suites, *Stevensoniana*, No. 1 and No. 2; *Nine Waltzes* for orchestra; *Poem* for violin and orchestra; prelude to Euripides's *The Trojan Women*; *Study in Jazz* for two pianos; *Jazz Scherzo* for two pianos and orchestra; and choruses, songs and pieces for piano.

**HILL, FRANK PIERCE** (1855- ). An American librarian (see Vol. XI). In 1917 he was chairman of the American Library Association war finance committee which raised over \$1,700,000 with which to provide library facilities at army camps. He was also chairman of

the Association's Committee on enlarged programme in 1919.

**HILL, JOSEPH ADNA** (1860- ). An American statistician (see Vol. XI). After service as chief statistician of the United States Census, he was appointed Assistant Director of the Census in 1921. He was the author of many census reports on child labor, the insane, divorce, and kindred subjects.

**HILL, LEONARD ERSKINE** (1866- ). An English physiologist (see Vol. XI). He was made director of the department of applied physiology of the National Institute of Medical Research, Mount Vernon, Hampstead. He published in two parts (1919-20) as a report to the Medical Research Commission *The Science of Ventilation and Open Air Treatment*; and in collaboration (Flack and Hill) *Textbook of Physiology* (1919). During the World War, he was a member of the Medical Research Commission. His later works include *Sunshine and Open Air, Their Influence on Health* (1924); *Health and Environment* (with Argyll Campbell, 1925); and *Common Colds* (with Mark Clement, 1929).

**HILLER, hīl'ēr, KURT** (1885- ). A German writer. He was born in Berlin and studied at the universities of Berlin, Freiburg, and Heidelberg, graduating as doctor of law. He is the author of: *Das Recht über sich selbst* (1908); *Die Weisheit der Langeweile* (1913); *Ein deutsches Herrenhaus* (1918); *Unnennbares Brudertum* (1918); *Geist werde Herr* (1920); *Logokratie* (1921); *Schmach des Jahrhunderts* (1922); *Der Aufbruch zum Paradies* (1922); *Verwirklichung des Geistes im Staat* (1925); and *Ist Genf der Friede?* (1927). He also compiled the anthology *Der Kondor* and edited the posthumous works of Max Steiner.

**HILLIS, NEWELL DWIGHT** (1858-1929). An American clergyman and writer (see Vol. XI). Since 1924 he has been pastor emeritus of Plymouth Church, Brooklyn, N. Y. Among his later books are *German Atrocities* (1918), *The Blot on the Kaiser's 'Scutcheon* (1918); *Rebuilding the Ruined Lands of Europe* (1919); *The Better America Lectures* (1921).

**HILLQUIT, MORRIS** (1869- ). An American Socialist (see Vol. XI). He was the Socialist candidate for Mayor of New York City in 1917. He wrote *From Marx to Lenin* (1921).

**HINDEMITH, PAUL** (1895- ). A German composer, born at Hanau, Hessen. He was a pupil of Hoch's Konservatorium, in Frankfurt. In 1915 he became concert master at the Frankfurt Opera, and in 1927 instructor at the Hochschule für Musik in Berlin. His first works, showing influences of Brahms, Reger, and Mahler, attracted little attention, but when he had developed into an uncompromising futurist, he was hailed as a new Messiah throughout Germany. As for ugly and grotesque effects, his music appears as a caricature of the style of Stravinsky or Schönberg. His productivity has been enormous, especially in the field of chamber music (sonatas, string quartets, etc.). His three one-act operas, *Nusch-Nuschi* and *Hoffnung, Mörder der Frauen* (Stuttgart, 1921) and *Sankta Susanna* (Frankfurt, 1922) were immediately suppressed by the police because of the alleged revolting immorality of the text. *Cardillac* (Dresden, 1926) has made the rounds of several stages of Germany, while the one-act *Hin und Zurück* had only one performance (Baden-Baden, 1927).

**HINDENBURG**, hin'den-burk, PAUL VON BENECKENDORF UND VON (1847- ). A German soldier (see VOL. XI). For his victories at Tannenberg and the Masurian Lakes, on the eastern front in the World War, he was made colonel general and, later, field marshal. In November, 1914, he was given command of the armies of the East, later of the Austrian front, and in 1918 he succeeded Falkenhayn as chief of the general staff. By that time, he was the national idol of the German people, and they erected an immense wooden statue of him in the Königsplatz in Berlin. Money was raised for war charities by charging a fee for the privilege of driving nails into the statue. After the War, he was of great assistance in disbanding the armies. He published his recollections under the title *Aus meinem Leben* (1920). After having previously twice refused to become a candidate, he was elected President of the German Republic in April, 1925, to succeed Friedrich Ebert (q.v.). In carrying out his policy of "uniting and coördinating the nation's constructive elements for the common welfare of the German people," he alienated the extreme Nationalists but gained the support of the liberal groups who favored the Republic as against a restored monarchy.

**HINDENBURG LINE**. See WORLD WAR, under *Western Front*.

**HINDHEDE**, MIKKEL (1862- ). A Danish physician and dietist, born at Lem bei Ringkøbing, who during the World War was responsible for the nutrition of the Danish people. He is known especially as a low-protein advocate. Up to the outbreak of the War, he was best known for two of his publications, *Protein and Nutrition* (1913) and *What to Eat and Why* (1914). These works are known through translations into English and German. His experiences in feeding the populace during the War were given out in 1920 in an official report of the Danish Minister of the Interior.

**HINDS**, ERNEST (1864- ). An American military officer, born in Marshall County, Ala. He was graduated at the United States Military Academy in 1887, entered the Army as second lieutenant in the 3d Artillery, and by successive promotions attained the rank of major general on Dec. 6, 1922. He participated in the War with Spain in Cuba and later saw duty in the Philippine Islands. During the World War, he was chief of artillery of the 1st Army Corps and then of the 1st Army in France, with the provisional rank of major general. In 1919-23 he was commandant of the Field Artillery School of Fire at Fort Sill, Okla., and in 1923-24 and 1925-28, of the 2nd Division and 8th Corps Area at Fort Sam Houston, Tex. He received the United States Distinguished Service Medal and the decorations of the Legion of Honor from France, the Order of Leopold from Belgium, and the order of St. Maurice and St. Lazarus from Italy.

**HINES**, FRANK THOMAS (1879- ). An American soldier, born in Salt Lake City, and educated at the Agricultural College of Utah. He enlisted for the Spanish-American War. In 1899 he was commissioned second lieutenant in the Utah Light Artillery. He then joined the Regular Army, and rising through the various grades, became captain of the Coast Artillery Corps in 1908. He was made brigadier general of the National Army in 1918 and of the Regular Army in 1920, resigning the same year. In 1917

he was assigned to the office of the Chief of Staff as assistant in the Embarkation Service, which he headed in 1918. In 1919 he was appointed Chief of the Transportation Service of the United States Army. He served at several important international conferences following the World War. In 1923 he was appointed director of the Veterans' Bureau. He was awarded the Distinguished Service Medal (both Army and Navy) and numerous foreign decorations.

**HINES**, JOHN LEONARD (1868- ). An American army officer, born in White Sulphur Springs, W. Va., and educated at the United States Military Academy. Commissioned second lieutenant in 1888, he served during the Spanish-American War, in the Philippines, and in the punitive expedition into Mexico in 1916-17, becoming brigadier general in 1918 and major general in 1921. In 1917 he was appointed assistant adjutant general in the American Expeditionary Forces and accompanied the first detachment of American troops to France. In May, 1918, he commanded the 1st Brigade Infantry, 1st Division; in October, 1918, the 3rd Army Corps, and in November, 1919, the 4th Division. He commanded the 5th Division in 1920 and the 8th Corps Area in 1921. General Hines succeeded General Pershing as Chief of Staff of the United States Army in September, 1924. He was appointed commander of the 9th Corps Area, Dec. 31, 1926.

**HINES**, WALKER DOWNER (1870- ). An American lawyer and public official, born at Russellville, Ky., and educated at Ogden College and the University of Virginia. In 1893 he began the practice of law in Louisville. He was general counsel of the Atchison, Topeka, & Santa Fé Railroad from 1906 to 1918 and chairman of the Board of Directors of this road from 1916 to 1918. In 1906-16 he engaged in general law practice in New York. In the latter year, he was appointed director general of railroads, serving until 1920, when he was in Europe as arbitrator under the Peace Treaties of questions of river shipping. On his return to the United States in 1921, he resumed the practice of law. In the summer of 1925, he made an investigation of Rhine and Danube navigation for the League of Nations. He is the author of numerous pamphlets and articles on railroad and governmental problems.

**HINKS-ON**, MRS. KATHARINE (maiden name TYNAN) (1861- ). An Irish novelist and poet (see VOL. XI). Her later writings include: *The Story of Margery Dawe* (1915); *John-a-Dreams* (1916); *Miss Mary* (1917); *Herb o' Grace* (1918); *The Man from Australia* (1919); *Love of Brothers* (1919); *The Second Wife* (1920); *The Wandering Years* (1922); *Mary Beaudesert, V.S.* (1922); *Wives* (1924); *Memories* (1924); *Life in the Occupied Area* (1925); *The Infatuation of Peter* (1926); and *The House in the Forest* (1928).

**HINSHAW**, WILLIAM WADE (1867- ). An American operatic baritone and impresario, born at Union, Iowa. While pursuing the general academic course at Valparaiso University (Ind.), he studied singing and theory with R. A. Heritage and later continued with L. G. Gottschalk and L. A. Phelps in Chicago. He made his debut on the concert stage in Chicago during the World's Fair (1893). From 1895 to 1899, he was dean of the Conservatory of Music at Valparaiso University. After coaching with A. Mareschalchi, he was engaged for

the Savage Grand Opera Company and made his operatic debut as Mephistopheles in St. Louis (Nov. 6, 1899) with marked success. In 1903 he opened his own school of opera, which soon became merged with the Chicago Conservatory, and until 1907 he was president of the combined institutions. In 1909 he organized the International Grand Opera Company of Chicago, of which he was general manager, stage-manager, and principal baritone. From 1910 to 1913, he was a member of the Metropolitan Opera Company and then made guest appearances in various German opera houses. In 1918 he became president of the Society of American Singers, an organization devoted to the production of intimate operas, especially Mozart's, in English. Since 1920 he has been directing his own chamber productions of opéra comique. He offered, in 1916, a prize of \$1000 for a one-act opera by an American composer. It was awarded to Hadley's *Bianca*, produced by the Society of American Singers, New York, 1917.

**HINTON, EDWARD WILCOX** (1868- ). An American lawyer and teacher, born at Rocheston, Mo., and educated at Christian College in Columbia, Mo., and at the University of Missouri, where he studied law. He began the practice of law at Columbia, Mo. He was professor of pleading and practice at the University of Missouri from 1903 to 1913 and after the latter year was professor of law at the University of Chicago. He edited *Hinton's Cases of Trial Practice* (1915); *Hinton's Cases on Evidence* (1919); and *Cases on Equity Pleading* (1926). He was co-editor of *Cook and Hinton's Cases on Common Law Pleading* (1923).

**HINTZE, PAUL VON** (1864- ). A German admiral and diplomat, born at Schweltdorf-Oder. He served for several years as military attaché at several embassies and was military plenipotentiary to Russia in 1908. In 1914 he was in service in the German Embassy in Mexico and in the same year was sent to China, where he carried on extensive propaganda in favor of Germany. He was transferred to Norway later in the same year. In 1918 he was appointed Secretary of State for Foreign Affairs and continued in this post until the fall of the empire.

**HIROHITO, EMPEROR OF JAPAN** (1901- ). Proclaimed heir apparent in 1912 when his father became Emperor, he succeeded to the throne upon the death of his father Yoshihito on Dec. 25, 1926. He was crowned Nov. 10, 1928, after a series of traditional ceremonies lasting three weeks. He was educated under private tutors at the Imperial Education Institute in Tokyo, and when he reached the age of 18 was given a seat in the House of Peers in the Imperial Diet. His father's ill health caused some of the imperial duties to devolve on the Prince in 1920. In the spring of 1921, he was sent on a visit to England, France, Belgium, and Italy, being the first Japanese prince to leave his native land. All hope of the Emperor's ability to continue his duties as ruler being abandoned, Prince Hirohito was designated Regent of Japan on Nov. 25, 1921. In December, 1923, a young student, inflamed by radical teachings, attempted to assassinate the young ruler. On Jan. 26, 1924, he was married to Princess Nagako, eldest daughter of Prince Kuni, with ancient Shinto rites.

**HIRSCHFELD, HERSCHELT, GEORG** (1873- ). A German author, at first chiefly a dramatist, and later a prolific novelist (see Vol.

XI). Among his later works are *Nachwelt* (1915); *Die Geborgte Sonne* (1916); *Die Deutsche Prinzessin* (1920); *Das Haus mit der Pergola* (1923); *Das Blut der Messalina* (1924); *Der Mann im Morgen-dämmer* (1925); *Opalritter* (1927); and *Frau Rietschel, das Kind* (1927). He also published a volume of letters and recollections, *Otto Brahm, Briefe und Erinnerungen* (1925) and a biography of Lord Byron (1926).

**HIRSCHFELD, LUDWIG** (1882- ). An Austrian, born at Vienna, and educated at technical schools. He was associate editor of the *Wiener Neue Freie Presse* and editor of the illustrated magazine, *Die Moderne Welt*. Hirschfeld is mainly a humorist but has written several comedies and texts for operettas, which include: *Der Wetterhan* (1911); *Der Berühmte Gabriel* (1916); *Die Steinerner Maske* (1918); *Die Grosse Dummheit* (1919); *Der Liebling der Frauen* (1920); *Die Silberne Jugend* (1921); and *Das Buch von Wien* (1927). He has also published *Die Klingende Stadt*, a volume of Viennese sketches (1912); *Wo Sind die Zeiten?* and *Ten Years of Viennese Life* (1920).

**HIRSCHFELD, MAGNUS** (1868- ). A German psychiatrist, famous for his exhaustive studies in sex confusion and allied subjects. Born at Kolberg, he settled in Berlin to practice neurology and psychiatry in 1910, and within a few years he had published the following exhaustive works: *Die Transvestiten*, 2 vols. (1910-12); *Die Homosexualität* (1914); *Sexual Pathologie*, 2 vols. (1917); *Sexual Zwischenstufen* (1922); *Sexualität und Kriminalität* (1924); and *Sexual-Katastrophen*, with L. Klauber and G. Lahnardt (1916).

**HIRT, HERT, HERMANN** (1865- ). A German philologist (see Vol. XI). Among his recent works are *Geschichte der Deutschen Sprache*; *Fragen des Vokalismus und der Deutschen Stammbildung im Indogermanischen* (1914); and *Etymologie der Neuhochdeutschen Sprache* (1920).

**HIRTH, FRIEDRICH** (1845-1927). A German-American Sinologue (see Vol. XI). He was professor of Chinese and head of the Chinese department of Columbia University, 1902-17. In 1917 he wrote *The Story of Chang K'ie'n, China's Pioneer in Western Asia*.

**HISPANIC SOCIETY OF AMERICA, THE**. An international organization founded in New York City in 1904 to encourage the study of the history, languages, and arts of the Spanish and Portuguese-speaking civilizations. Valuable additions have been made to the Society's original library of about 40,000 volumes, and to its collections of Hispanic paintings, manuscripts, maps, handwork, and other objects of art. Besides owning one of the most important collections of the paintings of Ignacio Sorolla in the world, the Society has sponsored temporary exhibitions of various sorts, presenting the work of such artists as Zuloaga, Cervantes, and Lope de Vega. Membership, which is honorary, is limited to 100, and includes Hispanic scholars of many nationalities. The Society publishes the *Revue Hispanique* in Paris every two months; and it also has published over 200 catalogues, reprints, and monographs. The museum and headquarters of the Society, opened in 1908; are at 156th Street, west of Broadway, New York City. The president is Archer M. Huntington; and the secretary, George Bird Grinnell.



**HISTOLOGY.** See ZOOLOGY.

**HISTORICAL ASSOCIATION, AMERICAN.**

A national organization founded in 1884 for the promotion of historical writing and studies in the United States. It publishes a quarterly, *The American Historical Review*, and the *Annual Report*. Under government provision, the association communicates its proceedings and information to the secretary of the Smithsonian Institution, for transmission to Congress. The membership, 3500 at the beginning of 1929, was drawn from Canada, Europe, and South America, as well as from every part of the United States. In 1927 the John H. Dunning Prize fund was added to the four awards regularly offered for historical essays. The Carnegie Corporation granted the association \$50,000 in December, 1928, to conduct a five-year survey of the historical and social courses offered in high schools. James Harvey Robinson succeeded James H. Breasted as president in 1928.

**HITCHCOCK, GILBERT MONELL (1859- )**.

An American lawyer, publisher, and public official. During the administration of President Wilson, he was chairman of the Foreign Relations Committee of the Senate and led in the movement for the ratification of the League of Nations in that body, 1919-20. He was defeated for reelection to the Senate in Nebraska in 1922. He has been publisher of the *Omaha World-Herald* since 1889.

**HITCHCOCK, HELEN SANBORN SARGENT (Mrs. RIPLEY HITCHCOCK) (1870- )**. An American art worker, born at Elizabeth, N. J. She studied at the Art Students' League and in 1898 founded the Art Workers' Club for Women, of which she was president for 11 years. In 1914 she founded and was first vice president of the Art Alliance of American Women. In 1917 she founded and was chairman of the Art War Relief.

**HITLER, ADOLF (1889- )**. A Bavarian reactionary leader, born in Austria, but a naturalized Bavarian. In November, 1920, he organized a movement in Bavaria similar to the Fascist movement in Italy. His followers wore gray shirts and brassards with an anti-Semitic Swastika cross in a white circular field on red. They were armed with blackjacks and, it was reported, with revolvers. Hitler had great gifts as an orator and organizer and stood for a strong united Germany. On Nov. 8, 1923, he and General von Ludendorff seized the government at Munich, but their power lasted only a few hours. Ludendorff was captured first; Hitler was taken on November 12. They were tried for treason in April, 1924, and Hitler was sentenced to a short term in the fortress at Landsberg, Bavaria. See GERMANY, under History.

**HJARNE, yårnë, HARALD GABRIEL (1848-1922)**. A Swedish historian (see VOL. XI). His later works include *Franförsvarsstriden* (1914); *Osteuropas kriser och Sverges försvar* (1914); *Mironredistenismen* (1915); *Vårt nuvarande tidsläge* (1916); *Vår ofverhängande fara fara* (1917); and *Finländska frågor* (1920).

**HOBAN, EDWARD FRANCIS (1878- )**. An American bishop of the Roman Catholic Church, born at Chicago and educated at St. Ignatius College, St. Mary's Seminary in Baltimore, and the Gregorian University at Rome. He was ordained priest in 1903. In 1908 he was appointed chancellor of the archdiocese of Chi-

cago and was consecrated bishop of that diocese in November, 1921.

**HOBART COLLEGE.** An institution for the higher education of men, at Geneva, New York; founded, chiefly under the auspices of the Protestant Episcopal Church in 1822, and permanently chartered by the Regents of the University of the State of New York in 1823. William Smith College, a coordinate institution for the separate instruction of women, administered by the Hobart College corporation, and with instruction given by the Hobart College faculty, was established in 1908. The student enrollment in Hobart College increased from 102 in 1914 to 312 in 1928, while registration in William Smith College in 1928 was 158, bringing the total up to 470. The combined faculty of the two colleges increased from 21 to 37 between 1914 and 1928; the productive funds rose from \$400,000 to \$1,141,000; property and equipment were valued at \$750,000 in 1928; the income for 1927-28 amounted to \$240,000; and the volumes in the library increased from 55,000 to 82,500. With a rapid increase in college enrollment following upon the World War, Hobart College turned its efforts chiefly to enlargement of endowment and expansion of the faculty, rather than to the construction of buildings. Existing property, however, was constantly improved, and a new wing, costing \$50,000, was added to the principal wing to provide additional classroom facilities. A few changes in curriculum, along the lines of modern trends, included an orientation course for freshmen, a limited number of courses in business administration for third- and fourth-year students, and a general course in science for students not specializing in scientific study. President, Murray Bartlett, D.D., S.T.D., LL.D.

**HOBHOUSE, LEONARD TRELAWNEY (1864- )**. A British sociologist and philosopher (see VOL. XI). He published in 1918 *A Philosophical Theory of the State*, a work in which he attacked the metaphysical absolutistic notions set up by the Hegelian school. He held that the habit of conceiving the state as a being led to political conservatism. He also wrote *The Rational Good: a Study in the Logic of Practice* (1921); *The Elements of Social Justice* (1922); and *Social Development, its Nature and Conditions* (1924). He was joint author, with G. C. Wheeler and Morris Ginsberg, of a survey, *The Material Culture and Social Institutions of the Simpler Peoples* (1915).

**HOBHEIM, MARTIN (1883- )**. A German professor of history at the University of Berlin. He was born at Friesdorf, studied in Heidelberg; Munich, Freiburg, Berlin, and Göttingen, and was lecturer at the University of Kiel in 1913 and in Berlin in 1914. In 1916 he founded a bureau for the repression of chauvinism. He became very active in political life. Since 1921 he has been councillor of the State Archives. His principal works include: *Maachiavellis Renaissance-und Kriegskunst* (1912); *Torsteisson als Vorgänger Friedrichs des Grossen* (1913); *Die Alldutsche Bewegung; Eine Politische Schluß und Gefahr* (1915); *Vaterlandspolitik* (1917); *Wir Brauchen Kolonien* (1918); *Chauvinismus und Weltkrieg* (1919); *Delbrück, Clausewitz, Kritik des Weltkriegs* (1920); *Untersuchungsausschuss und die Dolchstoßlegende* (1920).

**HOBSON, JOHN ATKINSON (1858- )**. An English economist (see VOL. XI). Besides

articles in British and American magazines, he wrote: *Towards International Government* (1915); *The New Protectionism* (1916); *Democracy after the War* (1917); *Richard Cobden: the International Man* (1918); *Taxation in the New State* (1919); *Problems of a New World* (1921); *Incentives in the New Industrial Order* (1922); *Economics of Unemployment* (1922); *Free Thought in the Social Sciences* (1926); and a study entitled *The Conditions of Industrial Peace* (1927).

**HOBSON, RICHMOND PEARSON** (1870- ). An American naval constructor, lecturer, and author (see VOL. XI). He organized (1921) and was general secretary of the American Alcohol Educational Association, and organized the International Narcotic Educational Association (1923), and the World Conference on Narcotic Education (1926). Among his later books are *Destroying the Great Destroyer* (1915); *America in the World War* (1917); *The Great Reform* (1918); *Alcohol and the Human Race for Truth Inoculation of Society* (1919); *Narcotic Peril* (1925).

**HOCHENEGG, JULIUS VON** (1859- ). An Austrian surgeon, known as a leading operator for cancer of the rectum. Having obtained his medical degree from the University of Vienna in 1885, he became an assistant to Professor Albert and in 1889 a private docent in surgery. From 1891 to 1904, he had a class in surgery in the Poliklinik of the University, after which he was made full professor of surgery with charge of the University Surgical Clinic. In 1906 he edited *Lehrbuch der Spezielle Chirurgie* (2 vols.), which was reissued in 1918. His military experiences were summed up in his *Kriegschirurgische Mittheilungen* in 1919. From time to time, he has reported his experiences with rectal cancer in the Vienna journals.

**HOCHSTETTER, hōc'shtët-ër, GUSTAV** (1873- ). A German writer, who was born at Mannheim and studied in Heidelberg and Berlin. A humorist, he edited the popular humorous magazine, *Die Lustigen Blätter*. He is the author of *Das Starre System* (1908); *Diskretion Ehrensache* (1909); *Der Tausendste* (1909); *Das Füsschen der Gnädigen Frau* (1912); *Die Heiratsjagd* (1912); *Hundert Frauen* (1913); *Wir Sind Wir* (1914); *Bismarcks Historische Karikaturen* (1914); *Das Morse Alphabet* (1915); *Debberitzer Briefe* (1916); *Lachende Geschichten* (1917); *Das Buch der Liebe* (1917); *Venus in Seide* (1920); *Das Lustige Hundebuch* (1920); *Lachendes Blond* (1921); *Der Musenkindewagen* (1922); and *Lustiges aus dem Hundeleben* (1926).

**HOCK, STEFAN** (1877- ). An Austrian writer, born at Vienna and educated in Vienna and Berlin. He was connected with the famous Burgtheater and was lecturer at the State Academy for music and drama. He is the author of *Die Vampyrage* (1900); *Der Traum: ein Leben* (1904); *Die Romantische Schule in Deutschland* (1910); *Karl May* (1912); *Friedrich Hebbel* (1913); *Gerhart Hauptmanns Odysseus* (1914); and *Prinz Eugen, der Edle Ritter* (1918). He compiled an anthology of Austrian verse, wrote a treatise entitled *Giebt es eine Oesterreichische Literaturgeschichte?* and edited the correspondence of Betty Paoli, Leopold Kompert, Grillparzer, and Hebbel, and translated, among other works, *Macbeth, Anthony and Cleopatra*, and plays by Tristan Bernard, Edouard Bourdet, and Jean Sarment.

**HOCKER, PAUL OSKAR** (1865- ). A German novelist, publisher of the magazine *Velhagen und Klasings Monatshefte*. He was born at Meiningen, had a university education, and studied at the Royal Academy of Music in Berlin. Included among his numerous works are *Fräulein Doktor* (1897); *Die Frau Rat* (1898); *Weisse Seele* (1901); *Letzter Flirt* (1902); *Frühlingstürme* (1904); *Don Juans Frau* (1906); *Die Verbotene Frucht* (1908); *Die Sonne von St. Moritz* (1910); *Die Lachende Maske* (1911); *Die Meisterin von Europa* (1913); *Ein Liller Roman* (1916); *Die Stadt in Ketten* (1917); *Der Held des Abends* (1920); *Die blonde Gefahr* (1923); *Thaddäus* (1923); *Dicks Erziehung zum Gentleman* (1924); *Modell Sirene* (1925); *Die Frau am Quell* (1926); and *Das ungetreue Liebespaar* (1927). He also wrote two plays, *Die Wappenhans* (1904) and *Das Volk in Waffen* (1913).

**HOCKEY.** This ice sport has gained an immense hold within a comparatively short period of time. Canada, which formerly was regarded as the home of hockey, has seen its championship laurels wrested from it by the United States and the game has attained much popularity in Great Britain, Switzerland, and France. Professional hockey, sponsored by the formation of an international league comprising leading cities of Canada and the United States, has scored an amazing financial success. Madison Square Garden, New York City, and the arenas constructed in Chicago, Detroit, and other places have proved inadequate to accommodate the thousands who enjoy the thrills afforded by a fast hockey encounter. Several new amateur leagues have been established with the smaller cities of Canada and the United States furnishing the teams, and these too have more than satisfied their promoters in the way of public support. Hockey has always been played among the larger Eastern colleges of the United States and many smaller institutions which could secure the necessary links have taken up the game enthusiastically. Field Hockey, a variety of the game, has met with favor with women athletes, both in the United States and Europe, and international contests are held frequently.

**HOCKING, JOSEPH** (1860- ). An English novelist and retired nonconformist minister (see VOL. XI). His later writings include: *The Day of Judgment* (1915); *The Path of Glory* and *Tommy and the Maid of Athens* (1917); *The Pomp of Yesterday* and *The Price of a Throne* (1918); *In the Sweat of Thy Brow* (1920); *Prodigal Daughters* (1922); *Prodigal Parents* (1923); *What Shall It Profit Man?* (1924); *Rosemary Carew* (1925); and *Felicity Trevellyn* (1927).

**HOCKING, SILAS KITTO** (1850- ). An English novelist (see VOL. XI). His later writings include: *The Beautiful Alien* (1916); *His Own Accuser* (1917); *Nancy* (1919); *Watchers in the Dawn* (1920); *The Greater Good* (1922); and *My Book of Memory* (1923).

**HOCKING, WILLIAM ERNEST** (1873- ). An American philosopher, born at Cleveland, Ohio, and educated at Harvard University. He was instructor in the history and philosophy of religions at Andover Theological Seminary (1904-06). After 1906 he taught philosophy successively at California, Yale, and Harvard Universities. He was appointed to the Alford professorship at Harvard in 1920. He is the author of two important works on religion and

ethics, *The Meaning of God in Human Experience* (1912) and *Human Nature and Its Remaking* (1918; rev. ed., 1924); also of *Man and the State* (1926); *Philosophy of Law and of Rights* (1926); and *Thoughts on Self, Body, Freedom* (1928). During the World War, he gave a series of lectures on *Morale and Its Enemies* (1918).

**HODGE, Rt. Hon. John** (1855- ). A British labor leader, born in Scotland. He was president of the British Steel Smelters' Mill, Iron, Tinplate, and Kindred Trades Association, and of the Iron and Steel Trades Confederation, which he founded, taking an active part in the political, municipal, and industrial movements of Glasgow and western Scotland until the Confederation moved to Manchester (1892). He was president of the Trades Congress (1892), president of the British Section of the International Congress at Zurich (1893), and a member of the City Council (1898-1901). He was a member of Parliament (1906-23), chairman of the Labor Party in the House of Commons (1915), on the Mesopotamia Commission and Minister for Labor (1916-17), and Minister of Pensions (1917-19).

**HODGES, Harry Foote** (1860- ). An American army officer, born at Boston, Mass. He graduated from the United States Military Academy in 1881, when he was made second lieutenant in the engineers. He continued in the Army until December, 1921, when he was retired with the rank of major general. In 1907 he became assistant chief engineer and a member of the Isthmian Canal Commission. Continuing in this position until 1915, he had much to do with the designing of the locks and dams and other regulating work on the Panama Canal, for which he received the thanks of Congress. During the World War, he had command of camps Devens (Mass.), Sevier (S. C.), and Travis (Tex.). He was also in France in command of the 20th Division. Later, he was in command of the North Pacific and 3d Coast Artillery districts until his retirement. He received the United States Distinguished Service Medal.

**HODGSON, Ralph** (1872- ). A British poet who, although he published little, wrote several of the outstanding poems of his time. His first book, *The Last Blackbird* (1907), was rather too conventional to draw attention to its author, but he grew rapidly thereafter and his work was awarded the Polignac Prize. Some of his best known poems were *The Song of Honour*; *Eve*; and *The Bull*. His small volume of collected *Poems* was published in 1917.

**HODŽA, Milan** (1878- ). A Czechoslovak professor and public official. He was a Slovak member of the Hungarian Parliament in 1905 and became known as an author of works on Slovak problems. In 1918 he was a member of the Constitutional Assembly of the new Czechoslovakian state, in 1919 Minister of unification, in 1920 a member of Parliament, in 1922-25 Minister of Agriculture, and after 1926 Minister of Education. He became a professor in Bratislava University in 1920. He is one of the leaders of the Agrarian Party and president of the Czechoslovak Academy of Agriculture.

**HOEBER, hō'bēr, Karl** (1867- ). A German pedagogue and editor of the *Kölnische Volkszeitung*, born at Dietz and educated at the universities of Freiburg, Heidelberg, and Strassburg. He taught in various colleges and was director of the Teachers' Seminary in Metz. He

is the author of *F. W. Weber, Leben und Dichtung* (1903); *Edmund Hardy, ein Lebensbild* (1905); *Sprachgebrauch im Volkstied des Vierzehnten und Fünfzehnten Jahrhunderts* (1908); *Das Deutsche Universitäts- und Hochschulwesen* (1912); *Die Religiösen Pflichten des Gebildeten Laienstandes* (1913); *Religion, Wissenschaft, Freundschaft* (1921); and *Pro Deo et Patria* (1921).

**HOENSBROECH, hōns'brög, Paul, Count** (1852-1923). A German theologian and writer on history and allied subjects (see Vol. XI). His later works include: *Zwei Welten: Dramatische Bilder* (1918); *Graf Herling, Reichskanzler* (1918); *Ein Stück Jesuitenmoral* (1918); *Wilhelm II, Abdankung und Flucht* (1918); and *Zurück zur Monarchie* (1918). He died Sept. 9, 1923.

**HOESSLIN, Franz von** (1885- ). An eminent German conductor, born in Munich. A pupil of Max Reger and Felix Mottl, he began his career as operatic conductor in Danzig (1907) and in 1912-14 was concert conductor in Riga. After serving in the World War, he was concert conductor in Lübeck, in 1919, and in 1920-22 conductor at the Nationaltheater in Mannheim. He went in 1923 as general musical director to Dessau, and in a similar capacity in 1926 to Barmen. In 1927 and 1928 he conducted the *Ring des Nibelungen* at Bayreuth.

**HÖFFDING, hēv'ding, Harald** (1843- ). A Danish philosopher (see Vol. XI), who, at 72, resigned his chair in the University of Copenhagen (1883-1915). In 1921 he helped organize the *Societas Spinozana*, an international body for the study and interpretation of the works of the great Dutch philosopher. Professor Höffding's later writings include: *Henri Bergson's Philosophy and Modern Philosophers* (1915); *The Great Humor* (1916); *The Concept of Totality* (1917); *Spinoza's Ethics* (1918); *Life and Interpretation* (1918); *Leading Conceptions in the Nineteenth Century* (1920); *The Concept of Relation* (1921); *The Conception of Analogy* (1923); an analysis, *Plato's State* (1924); *Epistemology and Conception of Life* (1925); *Religious Types of Thought* (1927); and *Memories* (1928). Many of these books were translated into English.

**HOFFMAN, Frederick Ludwig** (1865- ). An American statistician (see Vol. XI). Among his later books are *Industrial Accident Statistics* (1915); *Mortality from Cancer throughout the World* (1915); *A Plea and a Plan for the Eradication of Malaria throughout the Western Hemisphere* (1916); *National Health Insurance in Great Britain* (1920); *Race Amalgamation in Hawaii* (1921); *Health Conservation and Vital Statistics of South American Republics* (1921); "Record of Homicide and Suicide" (*Spectator*, N. Y., 1910-23); *Report on Lead Poisoning* (1927).

**HÖFFNER, W. F. Johannes** (1868- ). A German clergyman and writer, born at Dramburg. He studied theology at Halle and Berlin. After some years as a pastor, he became editor of the popular magazine, *Daheim*, a position which he filled until 1921. He is the author of *Pastorentheologie in Beispielen* (1906); *Der Sinn des Lebens*, a volume of stories (1909); *Frau Rat* (1910); *Der Scharfe Weingessang* (1909); *Elisabeth Goethe, geb. Teator* (1910); *Der Verschlussene Garten*, a novel (1910); *Misericordia* (1911); *Gideon der Art* (1911); *Die Treue von Pommern* (1912); *Aus Biedermeier-*

tagen (1912); Schiller (1913); *O du Heimgat* (1916); a biography of Goethe (1920); *Deutsche Seele* (1920); *Aus tiefer Not* (1921); *Melodie des Herzens* (1925); and, in Pommeranian dialect, *En beten pommerisch Ird* (1927).

**HOFMANN, JOSEF** (1877- ). A celebrated Polish pianist (see Vol. XI). In 1916 he featured on his recital programmes works by an entirely unknown composer, Michel Dvorsky, which attracted favorable comment. He also played two concertos for piano and orchestra by Dvorsky, *Chromaticon* and a concerto in A $\flat$ , and the Philadelphia Orchestra produced the same composer's symphonic poem, *Le Château Hanté*. A rumor began to circulate that Dvorsky was really Hofmann. No one could get into communication with the supposed Dvorsky. Hofmann himself declared that the composer had studied in Paris and was living in strict seclusion at San Sebastian, Spain. The mystery was cleared up on Dec. 28, 1923, when Stokowski gave an all-Hofmann programme, with Hofmann as soloist, which included all the compositions mentioned. This programme was repeated in New York a few days later. Hofmann's explanation was that he wished to secure an impartial opinion regarding the public's valuation of his works, an object which could not have been realized had the works been introduced under the composer's real name. When the Curtis Institute of Music was founded in Philadelphia, in 1924, Hofmann was secured as professor of piano, which position he continued to fill also after he was appointed director, in 1927.

**HOFMANN, hōf'mān, LUDWIG VON** (1861- ). A German painter who was born in Darmstadt and studied at the Academy of Karlsruhe, the Atelier Julian in Paris, and in Rome and Berlin. He was art instructor at the academies of Weimar and Dresden, and was known for his allegorical and historical paintings, and his mural work. Among his most famous figure pieces is the group "Adam and Eve." His mural paintings are in the museum and theatre of Weimar, University of Jena, and the Library of Leipzig. He is also a portraitist. He is a member of the Academy of Fine Arts in Berlin and a corresponding member of the Munich Secession.

**HOFMANNSTHAL, hōf'māns-tāl, HUGO VON** (1874-1929). An Austrian author whose dramas made him an outstanding figure in contemporary German literature (see Vol. XI). He published after 1914: *Prinz Eugen, der Edle Ritter* (1915); *Alkestis* (1916); *Rodauner Nachklänge* (1920); *Der Tod des Tizian* (1920); *Der Schuier* (1921); *Die Frau ohne Schatten* (1921); *Christine's Heimkehr*, a comedy (1921); *Jedermann*, a modernized version of *Everyman* (1922); *Buch der Freunde* (1922); *Der Turm*, a tragedy in five acts (1925, published in English translation, *The Tower*, 1928). He also edited two anthologies: *Deutsche Erzähler* and *Deutsche Epigramme*. A number of his plays served Richard Strauss as librettos for his operas.

**HOGARTH, hō'gāth, DAVID GEORGE** (1802-1927). An English archaeologist (see Vol. XI). During the World War, he was a commander in the Royal Naval Volunteer Reserve and director of the Arab Bureau, being one of the negotiators who induced Emir (later King) Feisal to lead the Arab revolt against Turkey. He was awarded the Founder's Gold Medal of the Royal Geographical Society in 1917 and was elected

president of that body in 1925. His later works included *The Ancient East* (1914); *Carchemish I* (1914); *The Balkans* (1915); *Hittite Seals* (1920); *Arabia* (1922); *The Wandering Scholar* (1925); *Kings of the Hittites*, Schweich Lectures, (1926).

**HOG CHOLERA.** See VETERINARY MEDICINE.

**HOG FEEDING.** See GARBAGE AND REFUSE DISPOSAL.

**HOGS.** See LIVE STOCK.

**HOLBROOK, ELMER ALLEN** (1880- ). An American mining engineer and public official, born at Fitchburg, Mass., and educated at the Massachusetts Institute of Technology. In 1911-12 he was professor of mining at the Nova Scotia Technical College and from 1917 to 1922 was associated with the United States Bureau of Mines in various capacities. He was dean of the School of Mines, Pennsylvania State College, 1922-27, and dean of the Schools of Engineering and Mines, University of Pittsburgh, after 1927. He is the author of many articles on mining and engineering.

**HOLBROOK, WILLARD AMES** (1860- ). An American army officer, born in Arkansas, Wis. He graduated from the United States Military Academy in 1885 and became second lieutenant in the 1st Cavalry. Continuing in the Army, he became in 1920, after successive promotions, chief of cavalry, with the rank of major general. He served in Cuba during the War with Spain, in the Philippines, at the Pennsylvania Military Academy, and on the Mexican border. During the World War, as a major general in the National Army, he commanded the Southern Department, having supervision of the Mexican border, and later Camp Sheridan, Ala. Later, he was made chief of staff of the Southern Department and then chief of cavalry. He was retired on July 23, 1924. His services won him the United States Distinguished Service Medal.

**HOLDEN, CHARLES ARTHUR** (1872- ). An American civil engineer, born at Hudson, Mass., and educated at the Thayer School of Civil Engineering of Dartmouth College and at Harvard. For two years, he was an instructor at the Worcester Polytechnic and in 1901 he returned to the Thayer School where, in 1908, he became professor of civil engineering, and in 1919, director. Professor Holden was engineer for New Hampshire in the New Hampshire and Vermont boundary litigation (1916- ). During the World War, he was executive secretary of the emergency help and equipment commission of New Hampshire and supervisor of military training at Dartmouth. He was a member of the New Hampshire House of Representatives (1925-28).

**HOLDICH, hōld'ich, SIR THOMAS HUNGERFORD** (1843- ). An English explorer (see Vol. XI), who was president of the Royal Geographical Society from 1916 to 1918. His later publications include *Political Frontiers and Boundary Making* (1916) and *Boundaries in Europe and the Near East* (1918).

**HOLITSCHER, ARTHUR** (1869- ). An Austrian writer, born at Budapest. He is the author of novels and short stories, among them: *Leidende Menschen* (1893); *Der Vergiftete Brunnen* (1900); *Der Golem* (1909); *Schlafwandler* (1919); and *Adèle Bourkes Begegnung* (1920). He also wrote a play, *Das Andere Ufer* (1901); some essays, *Ideale des Alltags* (1920); and

books of travel, *Amerika Heut und Morgen* (1912); *Drei Monate in Soviet Russland* (1921); *Reise durch das jüdische Palästina* (1922); *Gesang an Palästina* (1922). He also wrote *Ekstatistische Novellen* (1923); *Das Theater im revolutionären Russland* (1924); *Lebensgeschichte eines Rebellen*, autobiography (1924); *Der Narranbaedeker* (1925); *Der Fall Ravachol* (1925); and *Das unruhige Asien* (1926). He translated Oscar Wilde's *Ballad of Reading Gaol*.

**HOLL, hól, KARL** (1886- ). A German Protestant theologian, and professor at the Karlsruhe Technical High School (see VOL. XI). Like many other German writers, after the World War, he turned to Luther for spiritual guidance. He published *Die Bedeutung des Grossen Krieges für das Religiöse und Kirchliche Leben der Protestanten* (1917); *Was Verstand Luther unter Religion?* (1917); and *Luther und Calvin* (1919).

**HOLLAND.** See NETHERLANDS.

**HOLLAND, CLIFFORD MILBURN** (1883-1924). An American civil engineer, born at Somerset, Mass. He studied at Harvard. Employed by the New York Rapid Transit and Public Service Commissions, he was assistant engineer in the building of the Joralemon Street tunnel under the East River, between Manhattan and Brooklyn (1906-09), and in 1908-12, for the Fourth Avenue subway, New York City. Subsequent to 1916, he continued this service as division engineer in charge of all tunnels built under the East River. He later became chief engineer of the New York State Bridge and Tunnel Commission and of the New Jersey Interstate Bridge and Tunnel Commission, directing construction of the vehicular tunnel connecting New York and New Jersey, to which his name was given after his death.

**HOLLAND, RUFERT SARGENT** (1878- ). An American lawyer and writer, born at Louisville, Ky. He graduated from Harvard in 1900 and from the Law Department of the University of Pennsylvania in 1903. He was chief attorney for the Legal Aid Society of Philadelphia from 1904 to 1910 and lectured also for the American Society for the Extension of University Teaching. A writer of historical works and fiction, his publications include *Builders of United Italy* (1908), *Historical Inventions* (1911); *Historical Events of Colonial Days* (1916); *The Blue Heron's Feather* (1917); *The Panelled Room* (1921); and *Historic Railroads* (1927).

**HOLLANDER, JACOB H (ARRY)** (1871- ). An American economist (see VOL. XI). Since 1925 he has held the Hutzler professorship of political economy at Johns Hopkins. His later writings include *The Abolition of Poverty* (1914); *War Borrowing* (1919); and *Economic Liberalism* (1925).

**HOLLINGWORTH, HARRY LEVI** (1880- ). An American experimental psychologist, born at DeWitt, Neb., and educated at Columbia University. In 1909 he was appointed instructor of psychology at that institution, in 1916 he became associate professor, and in 1921 professor. He was one of the leaders in the movement for industrial application of scientific psychology. His principal works are *Studies in Judgment* (1913); *Outline for Experimental Psychology* (1914); *Outlines for Applied and Abnormal Psychology* (1914); *Advertising, Its Principles and Practice* (1915); *Vocational Psychology* (1916); *Science of Taste* (1917); *Applied Psychology* (1917); *Psychology of*

*Functional Neurosis* (1920); *Judging Human Character* (1922); *Psychology of Thought* (1926); *Mental Growth and Decline* (1927); and *Psychology, Its Facts and Principles* (1928).

**HOLLIS, HENRY FRENCH** (1869- ). An American public official (see VOL. IX). He served in the United States Senate from 1913 to 1919 and during the World War did relief work in Poland and Siberia. He was decorated by these governments for his services.

**HOLLIS, WILLIAM STANLEY** (1866- ). An American public official, born in Chelsea, Mass. He studied at the United States Naval Academy in 1883-84 and left on account of a gun accident. He served in several capacities in the consular service from 1889 to 1911, when he was appointed consul general of Beirut, Syria. On the entrance of Turkey in the World War, he had charge of the interest of the Allies in Syria. He was also head of the American Red Cross in Beirut and was prominent in relief work in Syria and elsewhere. He served as consul general in London in 1919 and during other periods and was a representative in London of the United States War Trade Board and other important bodies. In 1920 he was appointed consul general at Lisbon, Portugal.

**HOLLISTER, NED** (1876-1924). An American zoologist, born at Delaware, Wis. He collected extensively in field zoology throughout the western part of the United States (1902-09) and was then assistant curator of mammals at the United States National Museum (1910-16) and superintendent of the National Zoological Park (1916-1924). He published *Birds of Wisconsin* (1903); *Systematic Synopses of Muskrats* (1911); *Mammals of the Philippine Islands* (1912); *Mammals of Alpine Club Expedition to Mt. Robson* (1913); *Philippine Land Mammals in the United States National Museum* (1913); *A Systematic Account of the Grasshopper Mice* (1914); and *East African Mammals in the United States National Museum* (1918, 1919).

**HOLM, hól, FRITS (VILHELM)** (1881- ). A Danish explorer, born at Copenhagen, and educated at Copenhagen University and in the Danish Royal Navy. In 1907-08 he commanded a scientific mission into the interior of China, the result of which was the bringing to the Western world of the only existing monolithic replica of the famous Nestorian Monument of A.D. 781, which was lent to the Metropolitan Museum of Art in New York, 1908-16. This replica is now in the Lateran Palace in Rome, Italy. During the World War he was a correspondent and a Red Cross Commissioner, and received many decorations for his work. In 1923 he published *My Nestorian Adventure in China*.

**HOLM, GUSTAV FREDERIK** (1849- ). A Danish explorer (see VOL. XI). An English translation of *Legends and Tales from Augmasalik* appeared in 1914, and in 1925 he published *De islandske Kursforkrøfters Svalbarde*.

**HOLMES, HARRY NICOLLS** (1879- ). An American chemist, born at Fay, Pa., and educated at Westminster College and Johns Hopkins University. During 1900-07 he was an assistant in chemistry at Johns Hopkins and then became professor of chemistry at Earlham College until 1914, when he was called to a similar chair at Oberlin College. Dr. Holmes is a specialist in the chemistry of soaps and in colloid chemistry. He has been a member of the National Research Council since 1923. He is the



author of *Outline of Qualitative Analysis* (1908), *Laboratory Manual of General Chemistry* (1909), *General Chemistry* (1921), *Laboratory Manual of Colloid Chemistry* (1921), and *Introductory College Chemistry* (1925).

**HOLMES, JOHN HAYNES** (1879- ). An American clergyman (see VOL. XI). He was chairman of the General Unitarian Conference from 1915 to 1917, president of the Free Religious Association from 1914 to 1919, and was made director of the Civil Liberties Bureau in 1917. He broke from Unitarianism and became an independent in 1919. His later writings include: *Is Death the End?* (1915); *New Wars for Old* (1916); *Religion for To-day* (1917); *The Life and Letters of Robert Collyer* (1917); *Readings from Great Authors* (1918); *The Grail of Life* (1919); *Is Violence the Way Out?* (1920); *New Churches for Old* (1922); and *Patriotism Is not Enough* (1925). He is editor of *Unity* (Chicago) and contributing editor of *The World Tomorrow* (N. Y.).

**HOLMES, OLIVER WENDELL** (1841- ). An American jurist (see VOL. XI). He is known for his numerous minority opinions in the Supreme Court representing a liberal feeling in a conservative court. *A Collection of Legal Papers*, by Justice Holmes, was published in 1920 and in 1924 he contributed to the volume, *Selected Essays on the Law of Torts*. Consult Richardson, *Constitutional Doctrines of Justice Holmes* (1924); and Frankfurter, *Mr. Justice Holmes and the Constitution* (1927).

**HOLMES, SAMUEL JACKSON** (1868- ). An American zoölogist, born at Henry, Ill. He was educated at the University of California and the University of Chicago (Ph.D., 1897). He was instructor in zoölogy at the University of Michigan (1899-1905), assistant professor there (1905-11), and associate professor (1912-17); he was professor (1917- ) at the University of California. He published *Biology of the Frog* (1906); *Evolution of Animal Intelligence* (1911); *Studies in Animal Behavior* (1916); *Elements of Animal Biology* (1918); *The Trend of the Race* (1921); *Studies in Evolution and Eugenics* (1923); *Louis Pasteur* (1924); *A Bibliography of Eugenics* (1924); and *Life and Evolution* (1926).

**HOLMES, WILLIAM HENRY** (1846- ). An American anthropologist (see VOL. XI). He was curator of the department of anthropology at the Field Museum in Chicago, of the department of aboriginal pottery at the National Museum in Washington, and of the National Art Gallery of Washington (1910-20). After 1920 he was director of the National Art Gallery. He has published many works on archaeological and anthropological subjects. His most recent publication is *Handbook of Aboriginal American Antiquities* (1918).

**HÖLSCHER, hól'shēr, GUSTAV** (1877- ). A German theologian and authority on the Old Testament. He was born at Norden and studied at the universities of Berlin, Munich, and Leipzig. He lectured at the universities of Halle, Göttingen, and Giessen (1904-20) and in 1921 became professor of Old Testament science at Marburg. His works include *Palästina in Persischen und Hellenischen Zeiten* (1903); *Quellen des Josephus* (1904); *Sadduzäismus* (1906); *Landes- und Volkskunde Palästinas* (1908); *Two Greek Inscriptions from Khurbet Harrawi* (1909); *Geschichte der Juden in Palästina von Siebzig nach Christus* (1910); *Propheten* (1915);

*Entstehungszeit der Himmelfahrt Moses* (1919); *Entstehungszeit des Buches Daniel* (1920); and a work on the meters of Arab, Summerian, and Hebrew poetry.

**HOLST, GUSTAV** (1874- ). An English composer, born at Cheltenham. He studied at the Royal Academy of Music under Stanford and Parry, then played for some seasons in various orchestras, and finally settled in London as a teacher. In 1907 he became director of music at Morley College and also at St. Paul's Girls' School. In May, 1923, he conducted several of his works at the Ann Arbor (Mich.) Festival. Owing to injuries resulting from a fall, he resigned all positions in 1924 and devoted all his time to composition. His works include five operas, *The Revoke* and *The Youth's Choice* (neither of them produced), *Savitri* (London, 1916), *The Perfect Fool* (ib., 1923) and *At the Boar's Head* (Manchester, 1925); a masque, *The Vision of Dame Christian*; a symphony, *Cotswolds*; an overture, *Walt Whitman*; the orchestral suites, *Beni Mora*, *Phantastes*, *The Planets*, and *Japanese*; a symphonic poem, *Indra*; a *Fugal Concerto* for flute and oboe with string orchestra; *The Mystic Trumpeter* for soprano and orchestra; *Ornulf's Drapa* for baritone and orchestra; the choral works with orchestra, *Clear and Cool*, *King Psalms*, *Choral Hymns from the Rig Veda*, *The Cloud Messenger*, *Christmas Day*, *Hecuba's Lament*, *Hymn to Dionysus*, *The Hymn of Jesus*, *Ode to Death*; *First Choral Symphony* (Leeds Festival, 1925); and chamber music, and a number of songs and part songs.

**HOLT, HAMILTON** (1872- ). An American editor and college president (see VOL. XI). He was editor and owner of the *Independent*, (1913-21). In 1917 he was special lecturer for the World Peace Foundation, and the Isaac Bromley lecturer on journalism at Yale University. In the spring of 1918, he visited the Allied battle fronts as guest of the British, French, American, Belgian, and Italian governments and represented the League to Enforce Peace at the Peace Conference at Versailles in 1919. Since 1925 he has been president of Rollins College, Winter Park, Fla., where he established in 1920 the "Conference Plan of Study."

**HOLT, HENRY** (1840-1926). An American author and publisher (see VOL. XI). In 1915 he became a member of the Harvard Overseers Visiting Committee on philosophy and psychology. From 1914 to 1921, he edited *The Unpartisan Review* (formerly *The Unpopular Review*). In 1919 he published *The Cosmic Relations and Immortality*, and in 1923 *Garrulities of an Octogenarian Editor*.

**HOLT, LUCIUS HUDSON** (1881- ). An American author, born in Atchison, Kan., and educated at Yale. He was instructor in English there from 1905 to 1908 and assistant editor of *Webster's International Dictionary* from 1908 to 1910. He became professor of English and history at the United States Military Academy in 1910, and professor of economics, government and history and acting dean in 1920. He was a member of several societies and wrote *Introduction to the Study of Government* (1914); *Leading English Poets* (1915); *History of Europe, 1862-1914*, with A. W. Chilton (1917); *Brief History of Europe 1789-1915*, with A. W. Chilton (1918); *Military Correspondence, Reports and Orders* (1918); *Elementary Principles*

of *Modern Government* (1923); and *Introduction to Ancient History* (1927).

**HOLT, L(UTHER) EMMET** (1855-1924). An American physician (see VOL. XI), who died suddenly in China, where he had gone to deliver a course of lectures on pediatrics in the new medical college established at Peking by the Rockefeller Foundation. He published *Food, Health, and Growth* (1922). The Holt treatise on pediatrics was reissued the same year under the joint authorship of Holt and Howland of Johns Hopkins University. His booklet on the feeding and care of infants was translated into many languages.

**HOLT, WINIFRED** (MRS. RUFUS GRAVES Mather) (?- ). An American sculptor and philanthropist, born in New York City. She was educated privately and studied anatomy, drawing, and sculpture in Florence. Her works, exhibited in New York and in several cities of Europe, include portraits, busts, and bas-reliefs. She founded and was secretary of the New York Association for the Blind, and through her efforts several homes for the blind were founded. She also organized so-called lighthouses for the blind in France and other parts of Europe. In 1921 she visited Poland as a guest of the Polish Government for the relief of the Polish blind. During the World War, she did much relief work among those blinded in battle. She was awarded medals by France and other governments and was the author of *A Short Life of Henry Fawcett* (1911); *The Beacon for the Blind* (1914); *The Light Which Cannot Fail* (1922), and numerous papers.

**HOLY CROSS, COLLEGE OF THE.** A Roman Catholic college for men under the Society of Jesus, at Worcester, Mass., founded in 1843. The student enrollment in the regular course increased from 597 in 1916 to 1090 in the autumn of 1928; the faculty in the same period was increased from 44 to 91; and the volumes in the library from 50,000 to 100,000. President, the Rev. John M. Fox, S.J.

**HOLY PLACES.** See ARABIA.

**HOLZ, hólts, ARNO** (1863- ). A German poet and critic (see VOL. XI), one of the founders of the naturalist movement in Germany. His later works include *Kindheitsparadies* (1924); *Stieben Billionen Jahre vor meiner Geburt* (1925); and *Götter und Götzen* (1925).

**HOLZKNECHT, GUIDO** (1872- ). An Austrian physician, pioneer in röntgenology, who attracted attention through his attempts to "rejuvenate" elderly women by raying the genital glands. Holzknecht is indirectly responsible for Gertrude Atherton's novel, *Black Owen*. Having received his medical degree from the University of Vienna, just as the Röntgen rays were coming into use in medicine, he began to devote himself to this subject and was eventually appointed professor of radiology in the university. Later, he became director of the Röntgen department of the Vienna General Hospital. He published the results of X-ray diagnosis in tuberculosis and diseases of the chest in 1901 in a volume entitled *Die Röntgenologische Diagnostik der Erkrankungen der Brusteingeweide*. In collaboration (Holzknecht and Jonas), he wrote *Die Radiologische Diagnostik der Intra und Extraventriculären Tumoren* (1908); and in 1921 he edited the large two-volume work, *Röntgenologie*.

**HOME READING COURSES.** See EDUCATION IN THE UNITED STATES.

**HOME RULE, MUNICIPAL.** See MUNICIPAL GOVERNMENT.

**HONDURAS.** A Central American republic with an area of about 44,275 square miles, and a population, on Jan. 1, 1923, of 773,408. The capital, Tegucigalpa, had 38,950 in 1920. Other important towns are La Esperanza (11,453), Santa Rosa (13,000), Nacaome (8152), Choluteca (8065), Amapala (2800); La Ceiba (8000), Puerto Cortés (4000). The percentage of illiteracy among children was 56 per cent and school attendance had increased only slightly since 1911. By the school census of 1919 only 35,912 children, out of the 87,207, were receiving instruction. In 1926-27 there were 859 public, and 36 private, schools with 35,216 children enrolled.

**Industry.** The cultivation of bananas and coconuts continues as the leading activity. During 1927 more than 19,000,000 bunches of bananas were produced and exported. The coconut production in the same year was more than 7,000,000. The coffee production remains stationary, while that of rubber has decreased. Cattle and horse raising is also on the decrease. After 1912 the country's trade consistently made gains, the imports being \$10,630,000 in 1927-28 as compared with \$5,132,679 in 1912-13; and the exports in 1927-28, \$17,546,000 as compared with \$3,180,968 in 1912-13. The United States supplied 77 per cent of the country's imports in 1927-28 and took 79 per cent of its exports.

**Finance.** For the year 1929-30, the budget was based on an estimated income of 13,101,972.78 pesos. (In 1913-14, this was 4,824,000). Receipts for the year 1928 amounted to 12,029,870.44 pesos and expenditures to 11,365,261.59 pesos. The national budget appropriations steadily increased after 1913-14, while both revenues and expenses were always larger than the budgeted amounts. The 1921-22 budget called for revenues and expenses of 6,674,895 pesos, but revenues were actually 7,386,979 pesos and expenses 7,196,161 pesos, showing a surplus of 190,818 pesos. The interest arrears on the foreign debt were not being paid with the result that the foreign debt totaled \$125,000,000 in 1923. Arrangements for its settlement were made in 1927. The internal debt in 1929 amounted to over \$9,000,000, United States currency. In 1922 the Banco de Honduras became the national bank of issue. In 1918 the peso was legally fixed at one-half the value of the American dollar. In 1920 an ambitious programme of fiscal reform was launched under the direction of an American expert, but it was not carried out because of lack of funds, while the years 1922, 1923, and part of 1924, were years of political disturbances, which made expenditures for war out of all proportion to other expenses, and created huge deficits. In 1920 the national railway of 95 kilometers was turned over to *Compañía Agrícola de Sula* to secure a credit of \$1,000,000 to be used in the complete reconstruction of the road. This *Compañía Agrícola*, a subsidiary of the American Fruit Company, was changed in 1924 to the Cortes Development Company, and retained control over the national railroad. Slightly over 500 miles of railways, in addition to the national line, were the property of American fruit companies operating on the north coast. There were no railways on the Pacific coast. There were about 200 miles of highways open the year around to wheeled traffic.

**History.** Internal affairs were stormy during and after the World War. In 1919 President Bertrand's well-prepared plans for his own reelection were upset by a revolt led by General Gutierrez. Bertrand fled the country; Gutierrez had himself declared Dictator; and, in October, 1919, was elected President. In 1920 disturbances were again reported with the result that United States warships had to proceed to the scene to protect American property. In 1923 on the eve of the forthcoming election, civil war again threatened and many prominent Hondurans sought safety in flight. After a contest, in which bloodshed and violence were not wanting, and which was marked by the continuous interference of the President, General Carias, Conservative candidate, received a plurality vote. The election was now thrown into the Congress which, in 1924, declared it could find for no one candidate. The usual round was now repeated. American marines were rushed to the scene but were not able to change the situation; the President, Gutierrez, proclaimed himself Dictator, Feb. 1, 1924; the disappointed presidential aspirants took up arms in rebellion and waged war intermittently on each other throughout February. In March, Gutierrez was put to flight, and, after a chaotic interregnum, Dr. Fausto Davilla, Conservative, was proclaimed provisional President by a group of revolutionary "generals"; but the forces defending Tegucigalpa set up a rival in the person of Zufiga Hueta. In the hope of restoring order, President Coolidge sent Sumner Welles as his special representative, in April, to mediate, and the four neighboring republics were invited to join in a conference with the warring Honduran factions. This somewhat unusual procedure met with success early in May, when one of the revolutionary chieftains, Gen. Vicente Tosta, was elected President and for a brief space the civil war seemed to be ended.

Elections were held at the end of June to choose deputies to a constituent assembly. Early in August, the fires of revolt again broke out. An insurrection against the provisional government of President Tosta, led by the Minister of War, General Ferrera, proved rather formidable, and it was not until late October that the Government, which had received the full support of the United States, was able to announce complete victory. At the close of the year, elections were held to choose a constitutional President, resulting in the choice of Dr. Miguel Paz Barahona. He was inaugurated Feb. 1, 1925, and was immediately recognized by the United States. He faced further armed revolt in the West, led by General Ferrera, but by August had restored order. His four years' administration was comparatively peaceful, in marked contrast to the long period of disorder preceding it. In 1928, as the time for a new election approached, there was intense political feeling but no armed outbreak, and the polling of the vote on October 28 was carried out peacefully. It resulted in the choice of Dr. Vicente Mejia Colindres for President and Rafael Diaz Chavez as Vice President. They were inaugurated Feb. 3, 1929.

In the field of foreign relations, a number of interesting developments were recorded during this period. On July 19, 1918, Honduras declared war on Germany and thus became an Associate Power and an original member of the League of Nations. Payment of dues in the

League became onerous, however, and on more than one occasion the country came to the verge of withdrawing but failed to take decisive action. Early in 1929, it was still listed among the members.

The government applied itself toward furthering the union of Central American states and, with Guatemala and Salvador, signed a pact in 1921 for common action in matters of trade, communications, and coinage. In 1922 a conference of the presidents of Nicaragua, Salvador, and Honduras was held on board the U. S. S. *Tacoma* in Fonseca Bay, at which the three countries reaffirmed in part the Treaty of Peace and Friendship of Dec. 20, 1907 (see CENTRAL AMERICAN UNION). On July 6, 1927, Salvador, Guatemala, and Honduras signed an agreement to consult each other before working out problems which might affect the general interests of Central America. Two attempts were made to settle the century-old dispute with Guatemala over the boundary line in the vicinity of the Montagua River Valley. In 1919 the two governments submitted the difficulty to the Secretary of State of the United States and an accurate survey under the auspices of the American Geographical Society was provided for.

In 1928 the unsettled question was again brought to the front by rival concessions granted by the two governments in the disputed area, and again the United States was asked to act as mediator. That country appointed the Hon. Roy T. Davis to head a mixed commission, but when the commission, after a thorough survey of the region affected had been made, failed to come to an agreement. Secretary Kellogg urged both countries to submit the dispute to the Central American Tribunal established in accordance with the convention of 1923. Guatemala agreed, but Honduras refused, and the dispute was still unsettled in 1929. On Mar. 8, 1926, an agreement for the settlement of a long-standing British debt was ratified, and in December, 1927, a commercial treaty with the United States, later ratified by both governments, was signed. On Mar. 11, 1929, there was approved a new immigration law restricting the immigration by providing more rigorous qualifications for entrance.

**HONEGGER, ARTHUR** (1892- ). A French composer, born at Hâvre. He studied in Zurich, 1907-09, and then with R. Martins in Hâvre and L. Capet in Paris, where he lived after 1913. He began as an extreme futurist and was soon recognized as the leader of the notorious group, "Les Six" (Auric, Durey, Milhaud, Poulenc, and Taillefer). In 1929 he visited the United States, appearing as conductor of his own works. His works comprise incidental music to Max Jacob's *La Mort de Ste.-Almeéne*; Morax' *Le Roi David*; Méral's *Dit des Jeux du Monde*; Gide's *Saul*; and Shakespeare's *Tempest*; a ballet, *Verité? Mensonge?*; a symphonic poem, *Pastorale d'Été*; a mimic symphony, *Horæe Victorieux*; *Rhapsodie* for piano, flutes, and clarinet; concerto for piano and orchestra; two extremely realistic pieces for orchestra, *Pacifico 231* (descriptive of a locomotive) and *Rugby* (descriptive of a foot-ball game); three nondescript stage works (an odd mixture of opera, oratorio, and ballet), *L'Empérialisme aux Rochers* (Paris, 1925); *Judith* (Monte Carlo, 1926) and *Antigone* (Brussels, 1928); chamber music, and songs.



*Photograph by Pach Bros.*

**HERBERT HOOVER**  
**ELECTED PRESIDENT OF THE UNITED STATES, 1928**





**HOOKER, (WILLIAM) BRIAN** (1880- ). American author (see VOL. XI). In 1915 he was awarded the prize in an American Opera Association competition for the opera *Fairyland*, with music by Horatio Parker. In the same year, he published another opera, *Morven and the Grail*, and a commemorative poem, *A.D. 1919*, also with music by Horatio Parker, and a volume of *Poems*, 1915. In 1923 he translated *Cyrano de Bergerac* from the French. He became literary editor of the New York *Sun* in 1917.

**HOOPER, C(HARLES) R(UGLAS)** (1835- ). An American chemist, born in Oskaloosa, Iowa, and educated at Haverford College and Harvard University, where he held a Carnegie fellowship, 1912-13. He was professor of chemistry at Penn College in Iowa (1909-10) and associate professor at Syracuse University (1913-15). In 1918 he became professor of chemistry at Wesleyan University, Conn. He has made determinations of atomic weights of elements, investigated tobacco smoke, and studied the analyses of gases. During the World War, he served with the Chemical Warfare Service and invented a gas absorbent and a gas detector.

**HOOVER, HERBERT CLARK** (1874- ). The thirty-first President of the United States, born at West Branch, Iowa, the son of a Quaker farmer. Left an orphan at 10 years of age, he was sent to his uncle's farm in Oregon to live. He ran away when he was 14 and went to Portland, Oreg., where he worked for a while in a real estate office. In 1891 he entered the newly established Leland Stanford, Junior, University, working his way through by establishing a laundry of which he made a success. Specializing in geology and engineering, he was in the first class graduated by the university in 1895. To perfect himself as a mining engineer, he became a common miner, and acquired familiarity with every part of the work. In 1897 he went to Australia as a mining engineer for an English syndicate and was successful in developing mines there. In 1899 he was appointed director general of mines by the Chinese government. His work in China was interrupted by the Boxer troubles; he was in Tientsin when the foreigners were besieged there. He defended not only his European co-workers but his Chinese workmen too, rescuing them in some cases from the firing squad. Later, he was engaged in mining operations in various parts of the world. He made and lost two fortunes and eventually won lasting success. He was living in England at the outbreak of the World War, and his services were at once required in aid of Americans stranded there with their funds cut off. Soon afterward, he was put in charge of the Belgian relief work and attracted wide attention by his great ability and enthusiasm. During three years, he traveled throughout Belgium and visited Brussels, London, Rotterdam, Lille, and Berlin, in order to confer with the heads of governments. About \$1,000,000,000 was expended on food and transportation, and of this sum one-half of 1 per cent was required for overhead expenses. He was appointed United States Food Administrator in 1917. He announced that the people of the United States could diminish their expenses in the necessities of life by 50 per cent. He instituted "wheatless days" and "meatless days," and urged avoidance of all waste. After the War, Mr. Hoover devised a chain of food depôts throughout central Europe on which

relatives and friends in the United States could draw for relief of the starving people in the countries desolated by the conflict. In March, 1921, he entered President Harding's cabinet as Secretary of Commerce, with the understanding that he was to continue his relief work. In 1921 he assumed general supervision of the relief work in Russia, on condition that all American prisoners held by the Soviet authorities should be released.

He was reappointed Secretary of Commerce by President Coolidge and greatly extended the scope of that department's activities and usefulness. In 1927-28 he served as chairman of the Mississippi Flood Relief Commission. He resigned his cabinet post in 1928 after receiving the Republican nomination for the Presidency, to which he was elected in November, receiving 414 electoral votes, including those of Florida, North Carolina, Virginia, and Texas, against 87 for Alfred E. Smith of New York, his Democratic opponent. In the interval between his election and his inauguration as President on Mar. 4, 1929, he made a tour of Central American and South American countries. The first months of his administration were marked by the reopening of the negotiations for limitation of naval armaments with Great Britain and other powers, and by his appointment of a National Law Enforcement Commission, headed by George W. Wickersham of New York, and of a Federal Farm Board, established by Congress at the President's request.

President Hoover holds honorary degrees from seventeen American and nine foreign universities, has received numerous medals from learned societies, was president of the American Institute of Mining and Metallurgical Engineers (1920), the American Engineering Council (1921), the American Child Health Association (1922), and served as chairman of a number of government commissions.

He wrote *Principles of Mining* (1906); *American Individualism* (1922); and in collaboration with his wife, who was Lou Henry of Monterey, Calif., a fellow student at Stanford University, he translated into English Agricola's *De Re Metallica*. His presidential campaign speeches were published under the title of *The New Day* in 1928.

**HOPE, ANTHONY.** See **HAWKINS, ANTHONY HOPE.**

**HOPE, JOHN** (1868- ). An American college president, born at Augusta, Ga., and educated at Brown and Chicago universities. After graduation from college, he devoted all his time to teaching colored youth. He served on the faculties of several colleges and universities in the South and was appointed president and professor of ethics at Morehouse College (then Atlanta Baptist College) in Atlanta, Ga., in 1906. In 1918-19 he did war work among the colored troops in France. He was a director and trustee of many institutions for colored people.

**HOPKINS, ARTHUR MELANCTHON** (1878- ). A dramatic producer, born in Cleveland, Ohio, who began his work in New York City in 1912. His best productions of later years include *The Poor Little Rich Girl*; *On Trial*; *The Deluge*; *Good Gracious, Annabelle*; *The Rescuing Angel*; *Be Oalm, Camilla*; *The Jest*; *Night's Lodging*; *Daddy's Gone a-Hunting*; *The Claw*; *Anna Christie*; *The Hairy Ape*; *The Old Soak*; *Rose Bernd*; *The Laughing Lady*; *Launsi*; *A Royal Fandango*; *What Price*

*Glory; The Second Mrs. Tanqueray; Deep River;* and plays by Tolstoy, Ibsen, and Shakespeare.

**HOPKINS, EDWARD WASHBURN** (1857- ). An American philologist (see VOL. XI). He was professor of Sanskrit language and literature and comparative philology at Yale, 1895-1926 (emeritus) and has published *Epic Mythology* (1915); *History of Religions* (1918); *Origin and Evolution of Religion* (1923); *Ethics of India* (1924); *Legends of India* (1928).

**HOPKINS, ERNEST MARTIN** (1877- ). An American college president, born at Dunbarton, N. H. He graduated from Dartmouth in 1901 and from that year to 1905 was secretary to the president there. He was secretary of the college from 1905 to 1910, and until 1916 was engaged in original research for various industrial concerns in Chicago, Boston, and other cities. He became president of Dartmouth on July 1, 1916. During 1918 he was in charge of the Industrial Relations of the Quartermaster Department, United States Army.

**HOPKINS, SIR FREDERICK GOWLAND** (1861- ). A British scientist and fellow of Trinity College, Cambridge. He has been professor of biochemistry at the University of Cambridge since 1914 and Sir William Dunn professor since 1921. He became a fellow of the Royal Society in 1905, and was the society's Croonian lecturer in 1915, and was awarded the Baly Medal (1915), the Royal Medal (1918), and the Copley Medal (1926). In 1921 he was Herter lecturer in New York and Baltimore. He was elected a foreign associate of the National Academy of Sciences (American) and numerous European learned societies, was knighted in 1925, and holds honorary degrees from seven British and Irish universities.

**HOPKINS, WILLIAM JOHNT** (1863-1926). An American author (see VOL. XI). His later works include *Those Gillespies* (1916); *The Clammer and the Submarine* (1917); and *She Blows! and Sparm at That!* (1922).

**HOPPE, WILLIAM H.** (1887- ). World's champion at 18.2 and 18.1 balkline billiards. He was born at Cornwall-on-the-Hudson, N. Y. From 1910 to 1920 and again from 1922 to 1924, he reigned supreme as a wielder of the cue despite the many times he was called upon to defend his laurels.

**HOPWOOD, AVERY** (1884-1928). An American playwright, born in Cleveland, Ohio. He was graduated from the University of Michigan in 1905, went to New York City as a correspondent for the *Cleveland Leader* the same year and there sold his first play, *Clothes*, written with Channing Pollock. His plays, which were produced not only in the United States, but in Canada, Europe, and the Orient, include *Fair and Warmer*, *The Gold Diggers*, *The Bat*, *Seven Days*, and *Spanish Love*, in collaboration with Mary Roberts Rinehart; *Ladies' Night*; *The Demi-Virgin*; *Little Miss Bluebird*; *Why Men Leave Home*; *The Alarm Clock*; *The Best People*, with David Gray; *Naughty Cinderella*; *Getting Gertie's Garter*, and *A Thief in the Night*. Virtually every one of his plays was a popular success. Many of them were broad farces.

**HORMONES.** See SECRETIONS, INTERNAL; ZOOLOGY, Physiology; HEREDITY.

**HORNADAY, WILLIAM TEMPLE** (1854- ). An American zoölogist (see VOL. XI). In 1926 he retired from the directorship of the New York Zoölogical Park. He wrote *Awake!*

*America* (1918); *Old-Fashioned Verses* (1919); *Minds and Manners of Wild Animals* (1922); *Tales from Nature's Wonderlands* (1924); *A Wild-Animal Round-up* (1925); and *Wild Animal Interviews* (1928).

**HORNBY, LESTER GEORGE** (1882- ). An American illustrator, engraver, and painter, born at Lowell, Mass., and educated at the Rhode Island School of Design at Providence, the Pape School in Boston, the Art Students' League of New York, and in Paris he studied with Laurens and others. Representative pictures of his are in the Victoria and Albert Museum (London), the Library of Congress (Washington), the New York Public Library, the Art Institute of Chicago, Detroit Institute, Carnegie Institute (Pittsburgh), etc. He has illustrated sketch books of London, Edinburgh, Paris, Boston, Washington, and Chicago, also *Some Old Riviera Towns* (1921); *Gloucester by Land and Sea* (1923); and is author and illustrator of *Balkan Sketches* (1927). His war etchings are well known.

**HORNE, HENRY SINCLAIR, FIRST BARON OF STIRKOE** (1861- ). A British soldier, who was educated at Harrow and Woolwich and entered the Royal Artillery in 1880. He served in the South African War. In 1914 he was made commander of the artillery of the 1st Corps, and in the following year commanded the 2d Division. He was sent to Egypt to defend the Suez Canal in 1916 and in the same year commanded the 15th Army Corps, and then the 1st Army in France where he served with distinction. In 1919 he was created Baron of Stirkoek and was given the eastern command (1919-23). He was aide-de-camp and general to the King (1920-24), and retired in 1926.

**HORNE, SIR ROBERT (STEVENSON)** (1871- ). A British public official, born in Glasgow and educated at the university there. In 1896 he was admitted to the Scottish bar and after 1918 was a Unionist member of Parliament. He was in the Admiralty in 1917 as assistant inspector general of transportation and in 1918 as director of the Admiralty Labor Department and Third Civil Lord. Entering the Cabinet as Minister of Labor (1919-20), he became president of the Board of Trade (1920-21), and Chancellor of the Exchequer (1921-22). He was made a member of the Privy Council in 1919, was knighted in 1920, and in 1921 was Lord Rector of Aberdeen University.

**HORSLEY, SIR VICTOR ALEXANDER HADEN** (1857-1916). An English surgeon and neurologist (see VOL. XI). On the outbreak of the World War, Sir Victor was the head of a hospital which saw service in Egypt. Later, he was made a colonel in the Mesopotamia Expeditionary Force and in the course of his duties succumbed at Amara to heat stroke. A biography of him, by Stephen Paget, appeared in 1919.

**HORTHY DE NAGYBÁNYA, NIKOLAUS** (1868- ). Regent of Hungary who was educated at the Naval Academy at Fiume. During the World War, he gave efficient service as captain of the battleship *Novara*, was promoted to be admiral of the fleet and in this capacity surrendered the Austro-Hungarian fleet to the Allies in 1918. In 1919 he organized a counter-revolution against the Soviet government in Hungary, under Bela Kun, and on the fall of that government came into supreme control. The National Assembly elected him regent in 1920 on the theory that the monarchy in Hungary

was only temporarily suspended. By provision of the laws, he may hold this office for an indefinite period. See *HUNGARY, History*.

**HORTICULTURE.** The tremendous stimulation given horticulture, as well as other forms of agriculture, by the urgent need of food during the World War resulted in an unprecedented speeding up of production which was followed by a disastrous readjustment period following the close of hostilities. Labor costs which rose excessively failed to recede to the pre-war scale, and many other items remained correspondingly high. The great stimulus to amateur gardening which resulted from war conditions gradually subsided, the trend being to commercial production. The ravages of introduced insect and fungus pests necessitated the purchase of expensive spraying machinery and thus indirectly contributed to the elimination of small enterprises. This trend toward commercial horticulture is clearly evident from statistics compiled by the U. S. Census which show in recent years an astonishing decrease in the number of bearing deciduous fruit trees. However, in the Pacific Coast States, where commercial orcharding prevails at its best, there has been an increase in the number of trees, the decline occurring in the Mississippi Valley and Eastern States where farm orchards used to be the general rule.

Despite the changes in the number of trees, total production of orchard fruits continued to increase much more rapidly than might be expected from population growth. For example, the total production of citrus fruits in 1928 was 59,836,000 boxes, as compared with approximately 23,000,000 boxes in 1909. In the decade ended in 1928, lettuce acreage in the United States increased sevenfold, spinach acreage, fourfold, and asparagus threefold, with other crops showing corresponding increments. One of the outstanding features of the decade was the southward migration of vegetable production to Florida, Texas, and California, necessitating broad readjustments in the older truck producing areas. During the latter part of the decade there was a phenomenal increase in grapefruit plantings due largely to developments in the Rio Grande Valley of Texas and in southern Arizona. The year 1928 was marked by heavy production of practically all horticultural crops, the white potato and grape attaining records.

The nursery industry of the United States underwent a material change due to the exclusion of various evergreens, bulbs, and other plants heretofore almost entirely purchased abroad.

One striking feature of the period following the War was the rapid replacement of established varieties of fruits and vegetables by new and better sorts. The Delicious apple became one of the leading varieties. The Stayman Winesap proved so much better than its parent, the Winesap, as to replace it largely in new plantings. The Golden Bantam and other yellow sweet corns continued to gain in favor over the older white sorts. Disease resistant varieties of many species gained ascendancy because of their ability to survive under adverse conditions. The wilt resistant Marglobe tomato developed by the U. S. Department of Agriculture was a striking example.

In respect to the horticultural situation throughout the world at large, one of the most striking features was the rapid expansion of the citrus industry in the Southern Hemisphere, important plantings being made in South Africa,

Australia, and South America. Another feature was the rapid recovery of the European fruit industry which naturally suffered severely during the War and the difficult post-war period. That foreign countries contribute vast quantities of horticultural products to the United States was indicated in over \$129,000,000 worth of horticultural products imported during 1928. Of this vast sum, the banana constituted over \$35,000,000.

**Protective Measures.** One of the most important developments of the period was the organization of the Federal Horticultural Board, as the result of the Plant Quarantine Act of August, 1912. This board, reorganized July 1, 1928, as the Plant Quarantine and Control Administration, has power to promulgate and enforce necessary protective measures for preventing the entrance of insect and fungus pests into the United States, and to control the movement of potentially dangerous plant materials between the States. That such protection is needed is shown by the entrance in the past of many serious pests, including the San José scale, gipsy moth, European corn borer, Japanese beetle, chestnut blight, white pine blister rust, etc. The enactment of Quarantine 37, effective on and after June 1, 1919, prohibiting, with certain exceptions, the importation of nursery stocks and other plants and seeds into the United States, has had and is having a very great effect on American horticulture, especially on those branches concerned in the propagation of ornamental plants. As a result, the American nurserymen have been forced to propagate many species of plants hitherto imported from foreign countries.

The continued spread, despite vigorous control efforts, of the European corn borer, Japanese beetle, and many other serious pests entering the United States previous to the organization of the Federal Horticultural Board, caused serious alarm. In many cases, the pests spread so rapidly that their eradication was considered out of the question. The gipsy moth continued its westward march throughout New England, in spite of the vigorous efforts made to stay its progress. Efforts were continued to eradicate the Parlatoria date scale, an insect capable of wiping out the infant date industry of the Southwestern States.

Material advances were made in the knowledge of protecting horticultural plants from various insect and fungus enemies. The utilization of dry insecticides and fungicides, known as dusts, steadily increased, until in many parts of the United States and Canada their use has become an important part of the protective programme. The discovery that many economic plants, including the potato, tomato, raspberry, etc., are subject to a serious form of disease commonly known as mosaic caused a great deal of concern. Careful studies indicated however, that healthy vigorous stocks could be maintained by rigorous selection in the field. Disastrous freezes occurring during the blooming periods of certain years caused serious losses to the fruit growers in many parts of the country and reawakened an interest in orchard heating as a means of protecting fruits from disastrous loss. Tests of the value of the airplane as a means of distributing poisons to control outbreaks of insects featured the period.

**Improved Transportation.** Material advances were made in the shipping and handling

of perishable products. The cooling of fruits and vegetables previous to placement in refrigerator cars became a general practice and enabled distant growers to get their products to the consumer without material loss in quality. The motor truck practically replaced the horse in the truck garden industry in the vicinity of large cities, making possible not only a geographical expansion of the trucking industry but also a quicker movement of highly perishable products. Greenhouse growers of lettuce, cucumbers, tomatoes, and other vegetables, suffered severely as a result of improved transportation facilities which enabled Southern and Western produce to reach Northern markets in excellent condition at all seasons.

**Marketing.** No phase of horticultural activity has exhibited such radical changes as that of marketing. Literally hundreds of coöperative agencies sprang up in various parts of the country and in most cases rendered material assistance to the long-suffering grower. The outstanding success of the California Fruit Growers' Exchange, even under the adverse conditions of the War, greatly stimulated the coöperative plan of marketing. A new system of selling fruits and vegetables arose. This is the f. o. b. auction, in which the product is inspected at the point of origin by government authorities and sold on this basis while in transit to market. Another striking development is the tremendous growth of roadside markets in the vicinity of cities and along important highways. These markets have become highly important factors in the disposal not only of fruits and vegetables, but also of flowers, canned products, cider, etc. Marketing was greatly aided by the development of better grading and packing practices, stimulated not only by greater demand for selected uniform products but also by the enactment of various Federal and State laws on the marketing and branding of fruits and vegetables.

**Investigational Activities.** Despite the serious disrupting forces of the War, scientific investigation rapidly recovered in the post-war period. The theory advanced in 1918 by the Oregon Experiment Station, namely, that growth and fruitfulness in plants are directly related to the balance between carbohydrates and nitrogen within the plant, proved of great benefit in assisting in the explanation of many cultural, pruning, and fertilization practices and furnished the basis for important subsequent studies. Of the several fertilizers commonly applied to fruit trees, nitrogen was found to be the only material giving an adequate return, and then for the most part only on poor soils or where the trees were growing in sod. Some indication was noted that phosphorus indirectly benefits fruit trees by increasing the growth of the cover crops which are grown in the orchard as a source of organic matter.

Studies in fruit storage contributed greatly to the knowledge of the proper time for picking and of the best methods of handling fruit in the storage. The work of the U. S. Department of Agriculture in the standardization of fruit and vegetable packages did much to protect the consumer from fraud. Experimental results disproved one popular and costly fallacy, namely, that fruit trees require severe annual pruning. Widely extended studies of self- and cross-fruitfulness in apples, pears, and other fruits definitely established the fact that self-sterility is a common condition in most varieties of culti-

vated fruits, the peach being a notable exception.

**Bibliography.** A few of the large number of horticultural books appearing recently were S. W. Fletcher, *The Strawberry in North America* (New York, 1917); V. R. Gardner, F. C. Bradford, and H. D. Hooker, Jr., *Fundamentals of Fruit Production* (New York and London, 1922); U. P. Hedrick et al., *The Cherries of New York* (Albany, 1915), *The Peaches of New York* (Albany, 1917), and *The Pears of New York* (Albany, 1921); W. Popenoe, *Manual of Tropical and Subtropical Vegetable Gardening* (New York and London, 1916); E. A. White, *The Principles of Floriculture* (New York, 1915); U. P. Hedrick et al., *The Small Fruits of New York* (Albany, 1925); E. H. Wilson, *Aristocrats of the Garden* (Boston, 1926); E. H. Wilson, *More Aristocrats of the Garden* (Boston, 1928).

**HORTON, ROBERT FORMAN** (1855- ). An English Congregational minister, president of the National Free Church Council (see VOL. XI). His later writings include *Reconstruction* (1915); *An Autobiography* (1917); *The Capacity for God* (1920); and *The Mystical Quest of Christ* (1923).

**HOUBEN, HEINRICH HUBERT** (1875- ). A German author and director of the literary department of the annual Leipzig book fair. He was born at Aix-la-Chapelle and studied in Bonn, Berlin, and Greifswald. He founded the *Deutsche Bibliographische Gesellschaft* and was literary director of F. A. Brockhaus' publishing house (1907-19). He is the author of *Karl Gutzkow* (1899-1901); *Emil Devrient, Leben und Wirken* (1903); *Jungdeutschlands Sturm und Drang* (1911); *Die Deutsche Revolution* (1919); *Hartmanns Revolutionäre Erinnerungen* (1919); *Karl Schurz's Befreiung Kinkels* (1920); *Adele Schopenhauer, Tagebuch einer Einsamen* (1921); *Ottile von Goethe, Erlebnisse und Geständnisse* (1923); and *Gespräche mit Heine* (1925). He also compiled *Berühmte Autoren des Verlags F. A. Brockhaus* and edited the works of Sven Hedin.

**HOUDINI, HARRY** (1874-1926). An American magician, born at Appleton, Wis. He began his career as a trapeze performer in 1892. He invented a diving suit, was interested in producing moving pictures, and was awarded a prize by the Australian Aëronautic League in 1910 for the first successful flight in Australia. He made many tours of the world and gave performances before the notables of various countries. He gained fame by exposing the tricks of mediums, as well as by his own remarkable achievements as a magician. He wrote *The Right Way to do Wrong* (1906); *Handcuff Secrets* (1907); *The Unmasking of Robert Houdini* (1908); *Miracle Mongers* (1920); *Spooks and Spiritualism*; *Rope Ties and Escapes*; *A Magician Among the Spirits* (1924). *Houdini: His Life Story*, by Harold Kellock, was published in 1928.

**HOUGH, EMMERSON** (1857-1923). An American writer, born in Newton, Iowa, and educated at the University of Iowa (A.B., 1880). He spent many years in traveling over the West and wrote much on the protection of game and other subjects relating to the public domain of the United States. He was responsible for the passage of the act of Congress for preserving buffalo in Yellowstone Park. He wrote *The Singing Mouse Stories* (1895); *The Story of the Cowboy* (1897); *Mississippi Bubble* (1902); *The*

*Lady and the Pirate* (1913); *The Magnificent Adventure* (1915); *The Way Out* (1918); *The Covered Wagon* (1922); *North of 36* (1923); and the posthumous *Mother of Gold* (1924). *The Covered Wagon*, as a moving picture was the most successful made up to that time. It ran steadily for over a year in New York City.

**HOUGH, LYNN HAROLD** (1877- ). An American clergyman (see Vol. XI). He was president of Northwestern University, 1919-20; pastor of the Central M. E. Church, Detroit, 1920-28; and pastor of the American Presbyterian Church of Montreal after February, 1928. Among his later works were: *The Quest for Wonder* (1915); *In the Valley of Decision* (1916); *The Little Old Lady* (1917); *The Significance of the Protestant Reformation* (1918); *The Clean Sword* (1918); *The Productive Beliefs* (Cole lectures at Vanderbilt University; 1919); *The Eyes of Faith* (1920); *The Opinions of John Cleland* (1921); *Life and History* (1922); *Synthetic Christianity* (1923); *The Imperial Voice* (1924); *Evangelical Humanism* (1925); and *Adventure in the Minds of Men* (1927).

**HOUGHTON, ALANSON BIGELOW** (1863- ). An American manufacturer and diplomat, born at Cambridge, Mass., and educated at Harvard University, in Germany, and in Paris. He engaged in the manufacture of glass at Corning, N. Y., and became president and official in several important glass companies and other concerns. He was a Representative in Congress, 1919-23, but resigned on his appointment as Ambassador to Germany by President Harding in February, 1922. He resigned in 1923 and was appointed Ambassador to Great Britain by President Coolidge. In 1928 he resigned that post and was an unsuccessful candidate for U. S. Senator in New York State. His resignation was not accepted by President Coolidge, however, and he returned to his London post, from which he again resigned following the inauguration of President Hoover on Mar. 4, 1929. In England, he was esteemed for his quiet but efficient work.

**HOURS OF LABOR.** Since the beginning of the World War, there has been evidenced a marked general reduction of hours of labor. That long hours do not pay has been coming more and more to be believed. The experiences of the War and particularly the report of the British munition workers' committee established this general principle beyond doubt. Moreover, the influence of the forces of labor was steadily gaining and culminated in considerable economic power during the War. These two circumstances combined not only to stimulate legislation for the limitation of working hours, but also to decrease hours of work in the industries which were not affected by the protective laws.

According to the Census of Manufacturers of 1914, 11.8 per cent of the workers covered worked in eight-hour establishments. In the 1910 census, 48.6 per cent did so, while figures compiled for the 1924 census showed that 51.5 per cent worked in eight-hour plants.

Hour legislation in the United States is still, due to constitutional limitation, largely confined to the protection of women and children. Since the beginning of the War, however, were enacted the LaFollette Seamen's Act of 1915 and the Adamson Act of 1916, regulating respectively the hours of maritime and interstate railway workers. Numerous eight-hour restrictions on work undertaken for the State and

several special prohibitions of long working hours in certain particularly dangerous occupations such as mining and caisson work also have become law. By amendment, in 1923, the Oregon statute provides for an eight-hour day in the lumbering industry when the adjoining States—California, Idaho, and Washington—have adopted similar restrictions. Within the decade, 1914-1923, 16 States were added to the ranks of those which regulate the working day or week of women either generally or in certain occupations, while the scope of many other laws and orders which applied only to specified employments has been made more general. At the beginning of 1929, only five States (Alabama, Florida, Indiana, Iowa, and West Virginia) had placed no restrictions on women's hours of work. Many States had limited hours to eight or nine a day. About three-fourths had a weekly limit of less than sixty hours.

Legislation, however, has not been limited to the restriction of daily or weekly hours of work. In addition, sixteen more jurisdictions now prohibit or regulate the night work of women, while of the eight night-work laws already in effect in 1914, several have since been enlarged in scope. New regulations providing for daily rest periods and a weekly day of rest also have been adopted, while the effectiveness of many of those previously operating has been increased. See WOMEN IN INDUSTRY.

The working hours of children are limited to eight in 35 jurisdictions—a substantial gain over 1914—while every State now regulates to some extent either the daily or weekly hours of child labor. Some of these restrictions, however, are generally regarded as inadequate, such as a 60-hour week in Louisiana, Georgia, Maryland, and Kentucky. Some are difficult to enforce, while others permit a large number of exceptions. The recent child-labor amendment will, when it has been ratified by the necessary three-fourths of the States, enable Congress to enact an adequate universal restriction of hours of labor for children (see also CHILD LABOR).

In addition to these statutory limitations on working hours in the United States, union pressure, as well as public sentiment, has worked toward a general reduction of hours in fields not affected by legislation. Perhaps the most outstanding example of this was the final adoption in 1923 by the steel industry of a three-shift eight-hour system instead of the former two-shift system, in deference, according to the executive head of the United States Steel Corporation, to "public sentiment, however created." See TRADE UNIONISM; LABOR ORGANIZATIONS, INTERNATIONAL; LABOR LEGISLATION; LABOR ARBITRATION; STRIKES.

**HOUBTICQ, LOUIS** (1875- ). A French art critic, born at Brossac, in Charente, and educated in Paris at the École Normale Supérieure. He was appointed professor of aesthetics and history of art at the École des Beaux Arts and was also a member of the Superior Council of Public Instruction.

His writings include *Rubens* (tr. 1918); *France, Histoire Générale de l'Art français* (prix Fould); *Les Tableaux du Louvre; Récits et réflexions d'un combattant* (prix Montyon); *La Jeunesse de Titien* (prix Fould); *Initiation artistique; Manet; Histoire de la Peinture, des origines au XVI<sup>e</sup> siècle; La Galerie de Médicis au Louvre; Every One's History of French Art* (tr. 1919); *De Poussin à Watteau* (1921); *De*



*Québec à Vancouver; à travers le Canada d'aujourd'hui*, with G. L. Jaray (1924), and *Encyclopédie des beaux-arts* (2 vols. 1925).

**HOURLWICH, ISAAC A (ARONVICH)** (1860-1924). An American statistician (see VOL. XI). His later works include *Mooted Questions of Socialism* (1917); he was also editor of a Yiddish translation of *Das Kapital*, by Karl Marx (1919).

**HOUSE, EDWARD MANDELL** (1858- ). An American publicist, born at Houston, Tex., and educated at Cornell University. He engaged in business in Texas and was at the same time active in Democratic politics as adviser, though not as an active participant or candidate for office. He was among the most prominent of those who worked for the nomination of Woodrow Wilson for the presidency in 1912, and he gained the confidence of Mr. Wilson to a marked degree. The President relied on him for advice in matters of appointment and policy. In 1914 at the outbreak of the World War, he visited the warring countries in an effort to find a basis for peace. During the years following, he made several other visits to Europe with the same purpose. When the United States entered the War in 1917, he attended the meetings of the Supreme War Council of the Allies in London, as chairman of the American Commission, and in that capacity communicated the views of the American government in regard to the conduct of the War to the Allied premiers and foreign ministers. As the end of the War approached in 1918, he was designated by President Wilson to act for the United States in negotiations for an armistice with the Central Powers. He was a member of the American Commission to Negotiate Peace at Paris, and during the absence of President Wilson from the United States, was practically in charge of American negotiations. On President Wilson's return to Paris, a break occurred in the relationship, and Mr. House ceased to take a prominent part in the deliberations. Following the War, he retired from public life. He was joint editor, with Prof. Charles Seymour, of *What Really Happened at Paris* (1921) and also published an autobiographical novel. *The Intimate Papers of Colonel House*, edited by Professor Charles Seymour of Yale, were published in 1927-28 in four volumes.

**HOUSE, ROY TEMPLE** (1878- ). An American university professor, born at Lexington, Nebr., and educated at Miami University and the University of Michigan. He taught French and German in several schools and colleges until 1905, when he was appointed head of the modern language department at the Oklahoma Southwestern State Normal School, where he served until 1910. In the following year, he was exchange professor in Germany. In 1911 he became professor of German and in 1918 head of the modern-language department of the State University of Oklahoma. He was director for the Commission of Relief in Belgium in 1916. His published writings include *Three French Comedies* (1905) and *Classroom French* (1910). He also translated several foreign plays and contributed book reviews to periodicals. Since 1927 he has been editor of *Books Abroad*, a quarterly book-review magazine.

**HOUSING.** The housing problem even before the World War was rapidly becoming serious. Already overcrowded conditions were being aggravated by the normal increase in population

and the concentration in industrial centres. The difficulty of providing houses to rent at a figure attractive to workmen was discouraging new building by investors, and the tradition of home ownership by workers appeared to be dying out. War conditions brought the situation to a crisis. For a time after the opening of the War, there was practically general suspension of building activities, on account of the shortage of material and labor and the highly increased costs. Repairs were neglected, replacements were not made, adequate provision was not supplied even for the normal increase in population, to say nothing of the emergency concentration at industrial centres. The congestion reached the previously unaffected middle classes. The return of the soldiers after the Armistice increased the urgency, and those governments which were not forced to deal with the situation during the War were unable to evade the issue in the years that followed. A brief account is given below of the widespread legislation, marking the post-war period, which aimed fully to utilize existing facilities, to curb profiteering, and to encourage building. Although by 1921 the house shortage was still serious, not only in every important country but even in centres as remote as Bagdad and Bombay, it was generally held that the crisis then had been passed, notwithstanding the fact that it would take many favorable years to make up the deficit.

**United States.** In 1917 the acute scarcity of housing accommodation, especially in munitions and shipbuilding centres, made Federal action imperative. The United States Shipping Board was given an appropriation to provide housing for its workers (\$10,000,000 was spent at Hog Island alone in that year); and in 1918 an additional \$95,000,000 was granted for this purpose. \$20,000,000 of which was to go to transportation facilities. The War Department also built temporary villages adjacent to inaccessible munitions plants. The United States Housing Corporation, with a total appropriation of \$100,000,000, carried on construction for the Bureau of Industrial Housing and Transportation in 128 communities, housing 25,000 families and 25,000 single laborers; after the Armistice, 6000 families and 8000 single laborers. Although it was estimated that between \$150,000,000 and \$250,000,000 was spent for workers' housing throughout the country in 1918, rents continued high, and in 1919 it was estimated that 1,000,000 additional houses were needed. There was a shortage of 35,000 apartments in New York City, and Chicago reported facilities 20 per cent less than requisite. To alleviate the situation, New York passed laws to permit the remodeling of old-type buildings, to protect tenants, and to stimulate building; the St. Louis Chamber of Commerce formed a \$2,000,000 building association; North Dakota launched a programme of State aid for houses not exceeding a cost of \$5000. The effort to stimulate building produced laws exempting new structures from taxation; and other laws attempted to control profiteering by setting a maximum percentage of increase within a given period and by limiting the landlord's arbitrary right to dispossess. In 76 cities, profiteering committees were formed; in 50 others, the Bureau of Industrial Housing and Transportation adjusted rent disputes. Although, after some improvement in conditions during the summer and fall, the crisis was believed to have been passed toward the close of

1920, the United States in 1921 was still facing a deficit of about 147 per cent of its normal building programme, which affected about 4,000,000 people. It was true that building costs had fallen, but private builders were still holding off awaiting a still further decrease. As for investors, with building costs still 100 per cent above the pre-war level and rents only 25 per cent above, home-building did not attract their capital; and while investigation pointed to from 13 to 14 per cent gross as the minimum return from any rented property, it was claimed that legislative interference kept rents at a figure that did not encourage building as an investment. About this time, price-fixing combines among contractors and producers of material, in some cases working in conjunction with corrupt labor leaders, were uncovered in New York and in Illinois.

The accompanying table comparing home-ownership statistics for the years 1910 and 1920 as given in the census shows a decrease, slight yet of some significance, in the economic independence of the population of the United States:

Year	Percentage of all homes				Percentage of owned homes	
	Rented	Owned	Owned Free	Owned Encumbered	Free	Encumbered
1920	54.4	45.6	28.2	17.5	61.7	38.3
1910	54.2	45.8	30.8	15.0	67.2	32.8

Investigation of housing conditions and legislation for their control were much stimulated and guided during the years after 1910 by the activities of the National Housing Association. Other attempts to improve the type of workers' homes were made by limited dividend companies (formed by philanthropic organizations, chambers of commerce, etc.), cooperative housing associations, and by both Federal and State authorities. Cooperative housing showed a little progress. There were some successful experiments in the larger cities and Wisconsin passed an act promoting it. There had been no tendency in the United States to follow that European policy under which the Government builds workers' homes; for, although Massachusetts did, with State money, build and sell 12 houses, the experiment seemed to have been abandoned afterward, and the Federal government's construction during the period was concerned only with war industry. Those forms of encouragement most in favor seemed to be the elimination of taxes on mortgages, tax exemption on new buildings, and government aid in the financing of local activities; construction itself was chiefly in the hands of contractors, although a considerable activity was shown by building and loan associations.

Total expenditures for new buildings were less in 1927 than for any year since 1923, according to the permits issued in 257 cities of the United States having a population of 25,000 or over. Permits issued in these cities in 1921 showed an estimated expenditure of \$1,673,127,938 for new buildings. A peak of money expended for new operations was reached in 1925 when the estimated expenditure was almost \$4,000,000,000, or 141.9 per cent more than in 1921. Permits issued in 1927 indicated an estimated expenditure of \$3,137,789,130, which was 99.5 per cent more than the 1921 expenditure. The expenditure for residential buildings in 1921 was \$937,352,739. In 1925, it was \$2,461,546,270, or

162.6 per cent greater than the 1921 expenditure. In 1927 it was \$1,906,003,260, or 103.3 per cent greater than the 1921 figure. The number of families provided for by new homes in new buildings was 224,545 in 1921. In 1925, 491,222 families were provided for; in 1927, the number of families provided for was 406,095. An index number weighed by population (that is, taking care of the increase in population), showed that with 1921 as 100.0; the index for families provided for in 1922 was 163.8; in 1925, 198.4; and in 1927, 157.3. Later figures collected by the Federal Bureau of Labor Statistics showed the same continued trend downward in residential building construction for the first half of 1928. The same source made a study of costs of one-, two- and multi-family dwellings for the period 1921-27. In 1921 the average expenditure for a one-family dwelling was \$3972; by 1927 it had reached \$4830, or an increase of 21.6 per cent. The average expenditure for a two-family dwelling also climbed until it reached its peak in 1926. In 1921 the average expenditure per family was \$3702; in 1926, \$4480; in 1927, \$4368, which was 16.1 per cent greater than the 1921 figure. For apartment-house dwellings, the average cost per family was \$4019 in 1921; in 1927 it was \$4170, or only 3.8 per cent greater than in 1921.

Records for the same 257 cities showed that there was an increase in apartment-house construction. In 1921, 24.4 per cent of families provided for by new construction were living in multi-family dwellings; by 1927, this figure had increased to 48.3 per cent. The number in one-family dwellings had dropped from 58.3 per cent in 1921 to 38.3 per cent in 1927. These proportions were much greater in the large cities than in the small. It was found that in 14 cities in the country with a population of a half-million or more, only 25.8 per cent of the families housed in new dwellings in 1927 were cared for in one-family dwellings, while 60.8 per cent were housed in apartment houses. In 1921 only 34 per cent of the new housing units were in apartment houses, while 44.2 per cent were in one-family dwellings. It was apparent that if this tendency kept continuing, the American urban population would soon approximate that of the European populations who were apartment-house dwellers. Consult *Housing Problems in America* (1929), Proceedings of the Tenth National Conference on Housing, Philadelphia, Jan. 28-30, 1929.

Great Britain. Following the outbreak of the War, two housing acts were passed in 1914, but these being limited in scope were not generally productive of results. Investigations in 1917 uncovered an immediate need of 400,000 dwellings in England and Wales and 109,000 in Scotland. Since it was evident that private enterprise could not meet the situation, the Housing Bill of 1919 was passed, making it incumbent on local authorities to carry out housing schemes, with the Government assuming the annual deficit in excess of a penny rate. In the same year, an additional act went into force, providing a subsidy of £15,000,000 for private persons building small houses; checking luxury building and the wrecking of dwellings; and otherwise facilitating construction. This undertaking to provide for a shortage of from 500,000 to 800,000 houses was abandoned in 1921, in an effort to cut down expenditures. The new policy called only for the completion of 198,000

houses already undertaken, at a cost of £10,005,000, and an expenditure of £200,000 in improvement of slum areas. This discouraging outlook, however, was lightened by the activities of about 60 local building guilds. A rent law fixing the percentage of increase and controlling disposition had been extended in 1919, and replaced by a new law in 1920. Further extension of these provisions became a definite political issue in 1923, when general decontrol was deferred to June 24, 1925, and the protection of the tenant extended to 1930. Nevertheless, under the 1923 Rent Law, it was much easier for landlords to evict tenants, and since with the coming in of a new tenant a house was "decontrolled," thereafter the landlord could charge what rent he pleased, subject only to a vague review by the courts. The housing shortage continued to be acute during the period after the War and, as late as 1929, played an important rôle in the politics of the country. In the general election of 1929, both the Liberals and the Laborites condemned the Conservative government for its failure to provide adequate housing for the working populations.

**France.** In 1919 there were still 550,000 buildings to be supplied in the devastated area, and there was much overcrowding in the larger towns. A Cheap Dwellings Bureau made some progress with garden suburbs outside of Paris; and the destruction of the Paris wall and military zone was ordered, making available about 3025 acres. Government aid was given in 1921 to about 2000 coöperative societies of reconstruction. Rent-limiting legislation had been found necessary; also some control over lodging and boarding houses. The housing shortage actually reached the stage of a crisis after the War and the Government was compelled to take extraordinary measures. Because of the necessity for the rebuilding of the devastated areas, the financial uncertainty, the movement of the rural populations to the cities, the influx of foreigners, etc., the French Parliament in 1928 found it necessary to pass a law making provision for the construction of 260,000 dwellings during the period 1928-33. The bill was passed by a unanimous vote in both Houses. Of these dwellings, 200,000 are to be sold at low prices and 60,000 are to be rented.

**Germany.** The situation in Germany was complicated by the unsettled financial and labor conditions. In a number of towns, house room was rationed and civilians were billeted in private homes; and letting or selling was subject to regulation. In 1921 a national law required all States to spend at least 30 marks per head on house construction in 1921-22. Nevertheless, by 1922, construction had practically ceased. The owners, with only about  $\frac{1}{1000}$  of their interest left to them by the Rent-fixing Law, had been practically expropriated. An attempt to raise a special fund for building was made in 1923 by levying a housing tax, fixed at 30 times the pre-war rent of houses. A law passed in 1923 to protect tenants was to have force until 1926. The shortage remained acute in the post-war period. A census made in 1927 showed that, in towns of more than 5000 inhabitants, there was a shortage of 776,000 dwellings. It was found that in cities of from 5000 to 20,000 population, families having no independent household formed 6.3 per cent of the total families; and in the large towns (over 100,000), the proportion was 10.3 per cent. The building activi-

ties, which had been checked in 1923 by inflation, were resumed in 1924 and by 1926, 199,084 new buildings had been erected in the year.

**Italy.** In 1920 Italy was trying to meet the situation through coöperative societies and building clubs in the North and by the building of garden suburbs around Rome (where one-third of the population were without permanent homes), building activity being encouraged by a government subsidy of 100,000,000 lire, a drastic Rent Law passed in 1919, and certain tax exemptions. In 1928 the Government took further measures to improve the situation in Rome when it authorized the Finance Minister to advance 48,000,000 lire to the Institute for Tenement Houses in Rome. The national Government also subsidized the construction of workingmen's dwellings in the cities of Venice and Bolzano.

**Other Countries.** Housing shortages were to be found in all the countries of Europe during and after the War and, despite governmental measures to check rent profiteering and to encourage the construction of new dwellings, the situation was still abnormal in most of the countries in the spring of 1929.

**HOUSMAN, ALFRED EDWARD** (1859- ). An English Latin scholar (see Vol. XI), who also wrote poetry. Besides magazine articles, he published *Last Poems* (1922) and edited *Book IV of Manilius* (1920) and *Lucan* (1926).

**HOUSMAN, LAURENCE** (1865- ). An English artist and author (see Vol. XI). His later publications include: *Bird in Hand* (1916); *The Sheepfold* (1918); *St. Francis Poverello* (1918); *The Heart of Peace* (1919); *The Wheel* (1919); *Ploughshare and Pruninghook* (1919); *The Death of Orpheus* (1921); *Angels and Ministers* (1921); *Possession: A Peep-show in Paradise* (1921); *Little Plays of St. Francis* (1922); *Dethronements* (1922); *Moonshine and Clover* (1922); *A Doorway in Fairyland* (1922); *False Premises* (1922); *Echo de Paris* (1923); *Trimblerrigg* (1924); *The Death of Socrates* (1925); *Ironical Tales* (1926); *The Comments of Juniper—Six Plays from the Life and Legend of St. Francis of Assisi* (1926); *The "Little Plays" Handbook* (practical notes for producers of the plays, 1927); *Uncle Tom Pudd* (1928); *The Love Concealed*, poetry (1928); and *The Life of H. R. H. The Duke of Flamborough* (1928).

**HOUSTON.** A city and port of entry of Texas. The population increased from 85,784 in 1910 to 138,278 in 1920 and to 285,000 in 1928, according to local estimate. The area is 70 square miles, or 44,800 acres. In 1927 and 1928 the communities of Park Place, Kennington, Harrisburg, River Oaks, and Memorial were added, increasing the population by 15,000. The government is vested in a municipal commission, consisting of a mayor and four commissioners, with a city manager, appointed by the mayor and serving as his first assistant. The entrance to the port of Houston is through a tidal channel extending from the Gulf of Mexico through the jetties between Galveston Island and Bolivar Peninsula across Galveston Bay, a distance of 25 miles, thence up the San Jacinto River through low-lying marshes and shallow bays to Lynchburg, a distance of 9 miles, then up the historic Buffalo Bayou to the turning basin at Houston, a further distance of 18 miles, making a total distance of 50 miles from the harbor to the Gulf. From 1919 to 1925, the natural channel extending from Galveston Bay to the turning basin within the city limits was deepened, widened,

and straightened at a total cost of approximately \$20,000,000, which was contributed by the citizens of Harris County and the United States government. Of this amount, \$7,700,000 was expended for wharves, warehouses, a public grain elevator, and other port facilities; the remainder represented the cost of dredging the channel to a depth of 30 feet and a bottom channel width of 150 to 300 feet. The waterway, or Houston Ship Canal as it is generally called, will be connected with the Mississippi River by the Intra-coastal Canal which is under construction. In 1920 the total business of the port amounted to 1,210,204 tons; in 1928 it had increased to 12,979,826 tons, a gain of 900 per cent.

As a result of the inauguration of deep-water commerce, an extensive industrial development has taken place in Houston. Since 1915 there have been constructed on the banks of the waterway more than 50 industries representing a capital investment of \$150,000,000, and on the light-draft channel above the turning basin are located 32 industries whose estimated capital investment is more than \$20,000,000. For many years, Houston has been the centre of the Gulf Coast oil section, and among the 38 companies located there are five of the world's largest producers of petroleum. The city is also one of the largest lumber markets in the United States, marketing approximately 50,000,000 feet of lumber annually. In addition to being the largest spot cotton market in the world, Houston has become, as a result of its port development, the second ranking cotton port in the United States. The 22 high-density cotton compresses which operate in Houston have warehouses with a total capacity of 1,145,000 bales of cotton. In 1919, 43,391 bales of cotton were shipped from Houston to foreign countries; during 1928, 1,968,969 bales were exported. In 1924 the city celebrated the exportation of its millionth bale of cotton for one shipping season. Approximately 44,000 persons are employed in Houston's 611 industrial establishments and receive \$81,850,000 in wages; the value of products manufactured in 1928 was estimated at \$178,842,961. Bank clearings in 1928 amounted to \$1,825,696,000.

From 1924 to 1929, Houston completed the greatest building programme in its history, the valuation of building permits issued during the period being \$175,867,117. This construction included a number of large office buildings in the city's business district. In addition to this private construction, Houston carried out such civic improvements as street paving, extension of waterworks, sewers, bridges, etc., authorized by a \$7,000,000 bond issue, and the erection of the Museum of Fine Arts, a magnificent public library, an outdoor theatre, and a mammoth auditorium with a seating capacity of about 15,000, which was constructed expressly for the 1928 National Democratic Convention. In 1929 an agreement was reached between the city officials and the Southern Pacific Railroad, assuring the construction of a new passenger station which with other proposed improvements, such as street widening and opening, stream relocation, and grade-crossing elimination, would cost approximately \$7,000,000. The Houston airport has been in operation since October, 1927. The landing field, which is 2620 feet square, is used by the air mail, 36th Division (Texas National Guard) Air Corps, and commercial and privately owned planes. The airport was formally dedicated on Mar. 2, 1928. Houston has 901 miles

of streets, 646 miles of gas mains, 566 miles of sewers, and 335 miles of water mains. The water-works system, supplied by deep artesian wells, is owned and operated by the city and is valued at \$8,446,822. Since 1925 the school board has expended approximately \$7,000,000 for the construction of 34 new school buildings, the renovation of 23 others, and the installation of new equipment. More than 42,000 children are enrolled in the Houston public schools. In 1927 a junior college was established as part of the public-school system. The assessed valuation of property in Houston, according to local estimate, is \$285,000,000, an increase of \$18,000,000 over 1927; the net debt in 1927 was \$35,744,000.

**HOUSTON, DAVID FRANKLIN** (1866- ). An American public official (see Vol. XI). From February, 1920, to March, 1921, he was Secretary of the Treasury. He was also chairman of the Federal Reserve and Farm Loan Boards. From 1916 to 1920, he was a member of the Council of National Defense. After retiring from public life, he became president of the Mutual Life Insurance Company of New York. He wrote *Eight Years with Wilson's Cabinet* (2 vols, 1926).

**HOUVILLE, GÉRARD D'**. See REGNIER, MARIE LOUISE ANTOINETTE.

**HOVGAARD, WILLIAM** (1857- ). An American naval architect, born at Aarhus in Denmark. He graduated from the Naval Academy of Denmark in 1879 and from the Royal Naval College at Greenwich, England, in 1886. After serving in the Danish Navy from 1897 to 1901, he went to the United States and became professor of naval design and construction at the Massachusetts Institute of Technology. He was employed in the Bureau of Construction and Repair of the Navy in 1917-18, and was consulting naval architect for the Bureau in 1919-26. He became a member of many naval and scientific societies, including the National Academy of Science (1929), and wrote *Submarine Boats* (1887); *Voyages of the Norsemen to America* (1914); *Structure and Design of Warships* (1915); *Modern History of Warships* (1920); and *General Design of Warships* (1920).

**HOWARD, THE RT. HON. SIR ESMÉ (WILLIAM)** (1863- ). A British diplomat who was born at Greystoke Castle, Cumberland, educated at Harrow, and passed the examination for the diplomatic service in 1885. After being attached to the embassies in Rome and Berlin, he retired from the service (1892), was assistant private secretary to the Secretary of State for Foreign Affairs (1894-95), and served in the Boer War. He was then honorary second secretary to the Embassy at Rome (1903), Consul General for Crete (1903-06), Councilor of the Embassy at Washington (1906-08), and Consul General for Hungary (1908-11). In 1911 he became Minister to Switzerland, in 1913 Minister to Sweden, and, after being on the British delegation to the Peace Conference and British Commissioner on the Special Interallied Mission to Poland in February and March of 1919, he became Ambassador to Spain. In 1924 he was appointed Ambassador to Washington. He was made Knight Commander of the Bath (1919), and was later raised to Knight Grand Cross of the Order of the Bath (1928).

**HOWARD, JOHN GALEN** (1864- ). An American architect (see Vol. XI). From 1901 to 1925, he was Supervising Architect and from 1913 to 1927, director of the School of Architec-

ture of the University of California, for which he designed the Greek Theatre and other buildings. He was a member of the National Institute of Arts and Letters and was formerly president of the Society of Beaux Arts Architects. In 1918-19 he served as captain in the American Red Cross in France.

**HOWARD, SIDNEY COE** (1891- ). An American dramatist. He was born at Oakland, Calif., graduated at the University of California (1915), and for a year engaged in special dramatic work under George P. Baker at the Harvard "47 workshop." In the earlier part of the World War, he served with the American Ambulance Corps on the western front and in the Balkans. After the United States entered the War, he became a captain in the U. S. Aviation Service. After the Armistice, he was on the staffs of *Life* and *Hearst's International Magazine*. He wrote the following plays: *Sicords* (1921); *Casanova* (adapted from the Spanish of de Azertis 1923); *Bewitched* (with Edward Sheldon, 1924); *They Knew What They Wanted* (Pulitzer Prize, 1925); *Lucky Sam McCarver* (1925); *Ned McCobb's Daughter* (1926); *The Silver Cord* (1926); *Salvation* (with Charles MacArthur, 1927); and *Yellowjack* (1928), besides various translations and adaptations. He is also the author of *The Labor Spy* (1921), and *Three Flights Up* (fiction, 1924).

**HOWARD UNIVERSITY.** A non-sectarian institution principally for the higher education of Negro men and women in Washington, D. C., founded in 1867, and largely supported by the Federal Government. In 1918 all the secondary schools of the University were abolished and the entire plan of undergraduate work changed. The four-year college course was divided into two periods of two years each, the Junior College, and the Senior Schools. The semester system was abolished in June, 1919, and the quarter system substituted. Departments of architecture, of public health, and of physical education were established. In 1928 the University was comprised of the following: College of liberal arts; college of education; school of applied science; school of music; school of religion; school of law; school of medicine; academic evening classes. Despite the loss of secondary students in 1918, the total enrollment of the institution rose from 1463 students in 1914 to 2384 in the autumn of 1928, including an enrollment of 402 in the summer session of that year. The faculty in the autumn of 1928 numbered 183 members. Congressional appropriations in the period under review increased from \$117,937 to \$240,000 annually, and \$150,000 toward the construction of a chemistry building in 1928-29, with an additional \$240,000 to be appropriated by the second session of the Seventieth Congress, for the same purpose. A dining hall with classrooms for the department of home economics was built in 1921 at a cost of \$301,000, and plans formulated in that year provided for a gymnasium for which Congress made appropriations in subsequent years, as well as for a medical building. A greenhouse was erected in 1919, and Howard Hall, for many years used as a detention house for incorrigible children, was renovated and made a dormitory for girls; many improvements also were made on the campus. Appropriations of \$150,000, and \$40,000 in 1928, provided for the construction of a dormitory for women. Total endowment in 1928 amounted to \$843,018, and the

library contained 46,389 volumes. President, Mordecai W. Johnson, S.T.M., D.D.

**HOWE, FREDERIC CLEMSON** (1867- ). An American lawyer and public official (see VOL. XI). From 1914 to 1919, he was Commissioner of Immigration at the Port of New York. He wrote *Socialized Germany* (1915); *Why War?* (1916); *Revolution and Democracy* (1921); *Denmark, a Cooperative Commonwealth* (1921); *Confessions of a Reformer* (1925); and other economic and political works.

**HOWE, GEORGE** (1870- ). An American University professor, born at Wilmington, N. C., and educated at Princeton, the University of Halle, Oxford, and the American Classical School in Rome. He became professor of Latin at the University of North Carolina in 1903, and from 1919 to 1922 was dean of the College of Arts. Professor Howe was the author of several textbooks and co-author of *Greek Literature in Translation* (1924), and *Latin Literature in Translation* (1925).

**HOWE, HARRISON ESTELL** (1881- ). An American chemist, born at Georgetown, Ky., and educated at Earlham College and Michigan and Rochester universities. After a period as industrial chemist, he became assistant to the president (1915), and later department manager of the research concern of A. D. Little in Cambridge, Mass. In 1919-22 he was chairman of the division of research extension of the National Research Council and also served as consulting chemist to the Ordnance Bureau. In 1921 he became editor of the *Journal of Industrial and Engineering Chemistry*, and in the same year published the *New Stone Age*. Among his later publications are *Profitable Science in Industry* (1924); *Chemistry in the World's Work* (1926); *Chemistry in the Home* (1927). He edited *Chemistry in Industry* (vol. i, 1924; vol. ii, 1925).

**HOWE, MARK ANTONY DE WOLFE** (1864- ). An American editor and author (see VOL. XI). His later works include: *The Humane Society of the Commonwealth of Massachusetts* (1918); *The Atlantic Monthly and Its Makers* (1919); *George von Lengerke Meyer, his Life and Public Services* (1919); *Memoirs of the Harvard Dead in the War against Germany*, 5 vols. (1920-24); *Memories of a Hostess* (1922); *Barrett Wendell and His Letters* (Pulitzer Prize for biography, 1924); *Causes and Their Champions* (1926). He was the editor of *Harvard Volunteers in Europe* (1916); *Marching with Sherman—Letters and Campaign Diaries of Henry Hitchcock* (1927); *Later Years of the Saturday Club* (1927); *Classic Shades* (1928).

**HOWELL, ROBERT BEECHER** (1864- ). A United States Senator, who was born at Adrian, Mich., and graduated at the United States Naval Academy in 1885. Having resigned from the Navy, he studied law at Detroit and in 1895-96 was State Engineer of Nebraska, becoming City Engineer of Omaha in 1896-97. He served as a lieutenant in the Navy during the Spanish-American War (1898). While a member of the Nebraska State Senate (1903-05), he obtained legislation that resulted in public ownership of the Omaha water plant in 1912 and he personally managed the plant until 1923. He was also director and general manager of the Metropolitan Utilities District (including Omaha and adjacent municipalities) for ten years (1913-23) and was active in establishing Omaha's



municipal ice plants. He was a member of the Republican National Committee for twelve years (1912-24) and was elected to the United States Senate for two terms (1923-35).

**HOWELLS, JOHN MEAD** (1868- ). An American architect, born at Cambridge, Mass., son of William Dean Howells. He graduated from Harvard in 1891 and afterward studied at the École des Beaux Arts. From 1907 to 1917, he was a member of the architectural firm of Howells & Stokes of New York and Seattle. In 1922 he was associated with Raymond M. Hood in designing and erecting the Tribune Tower Building in Chicago, winning in an international contest for the best design. He designed and erected buildings for Harvard, Yale, and Columbia universities and for various banks and other financial institutions. He contributed frequent articles on technical and literary subjects to magazines.

**HOWITZERS.** See ARTILLERY.

**HOWZE, ROBERT LEE** (1864-1926). An American soldier, born in Rusk County, Tex. He graduated from the United States Military Academy in 1888, served as a volunteer in the Spanish-American War, was major of the Porto Rico provisional regiment, 1901-04, and was commandant of cadets of the United States Military Academy, 1905-09. After further service in Porto Rico and as colonel of the 11th Cavalry, he was detailed to the General Staff in 1916. The same year, he was appointed brigadier general in the National Army and commanded the 2d Cavalry Brigade on the Mexican border. He became major-general in 1918 and was given command of the 38th Division. With this, he served in the Meuse-Argonne campaign and then was commander of the 3d Division with the Army of Occupation in Germany until Aug. 14, 1919. Upon his return, he was assigned to the Mexican border, commanding the 1st Cavalry Division. He was made a major general of the Regular Army in December, 1922.

**HRDLICKA, dīh'ka, ALES** (1869- ). An American anthropologist (see Vol. XI). He was the Huxley Medal lecturer in London in 1927. His later works include *Notes on the Pathology of the Ancient Peruvians* (1914); *The Most Ancient Skeletal Remains of Man* (1914); *Physical Anthropology in America* (1914); *Anthropology of the Chippewas* (1916); *Physical Anthropology of the Lenape, Delaware and Eastern Indians in General* (1916); *The Old White American* (1917); *The Genesis of the American Indian* (1917); *Anthropology of Florida* (1922); *The Old Americans* (1925). He was founder and editor of the *American Journal of Physical Anthropology* (1918- ).

**HUARD, FRANCES WILSON** (BARONESS HUARD) (1885- ). An American writer and relief worker, born in New York City. She was privately educated and in 1905 married Baron Charles Huard, a painter and illustrator of Paris. At the outbreak of the World War, she turned her château over to the French government for hospital purposes. When this building was destroyed, she transferred the hospital in 1917 to Paris, where she maintained 100 beds through funds collected during lecture tours in the United States. She wrote *My Home in the Field of Honor* (1916); *My Home in the Field of Mercy* (1917); *Lilies White and Red* (1918); *American Footprints in Paris* (with François Boucher, 1921). She was co-author of *French Rustic Furniture* (1927).

**HUBBARD, HENRY VINCENT** (1875- ). An American landscape architect, born at Taunton, Mass. He graduated from Harvard University in 1879 and afterward studied landscape architecture there and also at the Massachusetts Institute of Technology. From 1906 to 1918, he was a member of the firm of Pray, Hubbard & White, Boston. He was appointed instructor of landscape architecture at Harvard in 1906, assistant professor in 1910, and professor in 1921. He was a founder and chief editor of *Landscape Architecture* and the *City Planning Quarterly*. During the World War, he designed and built several cantonments and also assisted in designing housing communities. His works include *Introduction to the Study of Landscape Design*, in collaboration with Theodora Kimball (1917, 3d ed., 1927). In 1919 he edited the report of the United States Housing Corporation.

**HUBERICH, CHARLES HENRY** (1877- ). An American lawyer, born at Toledo, Ohio. He was educated privately and studied law at the University of Texas and in Germany. In 1898 he was admitted to the bar. He was a member of the faculty of the University of Texas from 1900 to 1905, and assistant professor and professor of law at Leland Stanford, Junior, University, 1905-12. In 1909-10 he was professor of law at the University of Wisconsin. He was a member of several legal associations and is the author of *The Trans-Isthmian Canal* (1904); *Law Relating to Trading with the Enemy* (1918); and volumes on the commercial law of Australia, New Zealand, Canada, and other British dominions in the *Commercial Laws of the World*.

**HUCH, hoo'g, RICARDA** (1864- ). A German poet, novelist, and historian (see Vol. XI). Her later works include a war novel in three volumes, *Der grosse Krieg in Deutschland* (1914); *Natur und Geist als die Wurzeln des Lebens und der Kunst* (1914); *Wallenstein* (1915); *Das Judengrab* (1916); *Luthers Glaube* (1916); *Der Fall Deruga* (1917); *Der Sinn der Heiligen Schrift* (1919); *Entpersönlichung* (1921); *Bakunin und die Anarchie* (1925); *Freiherr von Stein* (1925); and her novel of *Garibaldi*, his life and times, published in English under the title *Defeat* (1928).

**HUDDLESTON, SISLEY** (1883- ). An English journalist and author, born at Barrow-in-Furness, and educated at the University of Manchester and in Paris. Becoming a resident of Paris, he was for several years correspondent there for the *London Times* and afterward for the *Christian Science Monitor* of Boston. Besides contributing articles on international politics and economics to numerous British and American newspapers and periodicals, he wrote *Peace-Making in Paris* (1919); *Poincaré: A Biographical Portrait* (1924); *Those Europeans; France and the French* (1925); the volume on "France" in *The Modern World Series* (1926); and *Louis XIV in Love and War* (1929).

**HUDSON RIVER TUNNEL.** See TUNNELS.

**HUGGENBERGER, ALFRED** (1867- ). A Swiss writer who was born at Bewangen. His publications include *Liede und Balladen* (1895); *Winterm Pflug* (1908); *Die Stille der Felder* (1913); *Wenn der Märzwind Weht* (1920); and *Lebensstreu* (1923), poems; *Von den Kleinen Leuten* (1909), *Bauernland* (1913), *Dorfgenossen* (1914), *Aus meinem Sommergarten* (1917), and *Die heimliche Macht* (1919), short stories; the

novels *Die Bauern von Steig* (1913); *Die Geschichte des Heinrich Lents* (1915); *Jochems erste und letzte Liebe* (1922); *Die Frauen von Siebenacker* (1925); and, besides many one-act plays, the longer *Sie Hand wieder Eine* (1926).

**HUDSON, MANLEY OTTMER** (1886- ). An American lawyer and educator, born at St. Peters, Mo., and educated at William Jewell College, Harvard University, and the Harvard Law School. He was assistant in history at Harvard and Radcliffe colleges from 1907 to 1910, and from 1910 to 1919, professor of law at the University of Missouri. He joined the faculty of Harvard as assistant professor of law in 1919, was made full professor in 1921, and Bemis professor of international law in 1923. He was a member of many important commissions on State laws and in 1917 was attached to the office of the Solicitor to the Department of State. He was counsel of the United States government inquiry on the terms of peace, 1917-18, and served in other capacities at the Peace Conference in Paris. In 1919 he was a member of the legal section of the Secretariat of the League of Nations and acted as legal adviser to the International Labor Conferences in Washington and Genoa. Since 1924 he has been editor of the *American Journal of International Law*. He is the author of *The Permanent Court of International Justice* (1925); *The Next War* (1925); *Prospects for International Law in the Twentieth Century* (1925); *Current International Cooperation* (1927).

**HUDSON, W. H.** (1841-1922). A British naturalist and author, born at Quilmes, Argentina, of American parents who had settled there. He remained in South America till the age of twenty-nine, when he moved to England. Apart from his reputation as an understanding writer in natural history, which began with the publication of *Argentine Ornithology* (1888-89), he also attained a high place in English literature. It was in his writings on South America that he was most effective, poetic, and colorful. In *Green Mansions* (1904), by far his finest literary work, he produced a masterpiece of vivid description and delicate literary style. His published works include also: *The Purple Land* (1885); *A Crystal Age* (1887); *Naturalist in La Plata* (1892); *Idle Days in Patagonia and Birds in a Village* (1893); *British Birds* (1895); *Birds in London* (1899); *Nature in Downland* (1900); *Birds and Man* (1901); *El Ombú* (1902); *Hampshire Days* (1903); *A Little Boy Lost* (1907); *The Land's End* (1908); *Afoot in England* (1909); *A Shepherd's Life* (1910); *Adventure Among Birds* (1913); *Far Away and Long Ago and History of My Early Life* (1918); *Birds in Town and Village and The Book of a Naturalist* (1919); *A Traveller in Little Things and Dead Man's Pluck* (1921); and *A Hind in Richmond Park* (1922). Mr Morley Roberts in *W. H. Hudson, A Portrait* (New York, 1924), while expressly disclaiming the office of biographer supplied a valuable body of information and personal reminiscences.

**HUEFFER, FORD MADOX.** See FORD, FORD MADOX.

**HUGEL, hugel, FRIEDRICH, BARON VON** (1852- ). An Austrian-English writer on religion (see Vol. XI). In 1916 he wrote *The German Soul*; in 1921, *Essays and Addresses on the Philosophy of Religion*; and in 1927 *Selected Letters*.

**HUGGINS, MILLER J.** (1880-1929). Professional baseball player and manager, born at Cincinnati, Ohio. His first big league engagement was with the Cincinnati National League Club where he served from 1904 to 1909, when he was traded to the St. Louis Club of the same League. He managed this club for five years and was then made manager of the New York American League Club, his team, the "Yankees" winning pennants in 1921, 1922, 1923, 1926, 1927, and 1928, and the world's championship in 1923 and 1927.

**HUGHES, hüz, CHARLES EVANS** (1862- ). American jurist and public official (see Vol. XI). He resigned from the Supreme Court, to which he had been appointed in 1910 by President Taft, to become Republican candidate for the presidency in 1916. He was defeated by President Wilson, who received 277 electoral votes to his 254, and he then returned to the practice of law. In 1918 by appointment of President Wilson, he investigated alleged irregularities in the building of army and navy airplanes during the World War. He was Secretary of State in the cabinets of Presidents Harding and Coolidge (1921-25) and was chairman of the Disarmament Conference held at Washington in 1921-22. As Secretary of State, he negotiated the peace treaty with Germany, and handled issues involving mandates and American participation in the World Court, which he advocated in 1923. In 1926 he was appointed by President Coolidge a member of the Permanent Court of International Justice at The Hague and in September, 1928, he was elected a judge of the Court by the Council and Assembly of the League of Nations to succeed John Bassett Moore. He assumed his duties at The Hague May 1, 1929. He was chairman of the United States delegation to the Pan-American Conference at Havana in January, 1928, and for his outstanding services during that year was awarded the Roosevelt Medal of Honor. Although he had refused to be considered as a candidate for the Republican presidential nomination in 1928, he played an active and influential part in the campaign in support of Herbert Hoover, the party's nominee. After 1916 he was president of numerous legal societies, including the American Bar Association (1924-25), and other organizations.

He wrote *The Pathway of Peace* (1925); *The Supreme Court of the United States* (1927); and *Our Relations to the Nations of the Western Hemisphere* (1928). In 1929 his *Pan American Peace Plans*, lectures given at Yale University, was published.

**HUGHES, CHARLES FREDERICK** (1866- ). An American naval officer, born in Bath, Me. He graduated from the United States Naval Academy in 1884. During the Spanish-American War, he served on board the *Monterey*, participating in the battle of Manila. He was on duty with the Bureau of Equipment from 1904 to 1906 and served as Chief of Staff of the Atlantic Fleet in 1913-14. He was a member of the General Board of the Navy Department from 1914 to 1916 and served with the British Grand Fleet in the North Sea in 1917-18. In the latter year, he was promoted to the rank of rear admiral and was placed in command of the Navy Yard at Philadelphia (1918-20). He was commander of the 2d Battleship Squadron of the Atlantic Fleet (1920-21) and of Divisions 7 and 4 of the U. S. Battle Fleet (1921-23).

He was commandant of the Naval War College (1923-24), director of fleet training (1924-25), and later commandant-in-chief of the U. S. Battle Fleet and chief of naval operations.

**HUGHES, HATCHER** (?- ). An American playwright, born in South Carolina and educated at the University of South Carolina and Columbia University. In 1912 he started giving courses in the drama and playwriting at Columbia. For four years, he directed the Morningside Players, an organization of Columbia University, which was the first to present a play by Elmer Rice. Since 1922 he has been assistant professor of English at Columbia. In 1921 with Elmer Rice, Mr. Hughes wrote *Wake Up, Jonathan*, in which Mrs. Fiske starred on tour for a solid season after three months in New York. In 1922 Mr. Hughes's *Hell-bent for Heaven* was awarded the Pulitzer Prize. He also wrote *Honeymooning* (1927).

**HUGHES, HECTOR JAMES** (1871- ). An American engineer and educator, born at Centralia, Pa. He graduated from Harvard in 1894 and later studied at its Lawrence Scientific School. In 1899-02 he was connected professionally with the Chicago, Burlington, & Quincy Railroad in Chicago. In 1902 he returned to Harvard as instructor in civil engineering, becoming in 1914 professor of that subject, and in 1920 dean of the Engineering School. He is the author of *A Treatise on Hydraulics*, with A. T. Safford (1911); *Roads and Toll Roads in America* (1913); and *Highway Engineering Education* (1914-27).

**HUGHES, RUPERT** (1872- ). An American writer (see VOL. XI). His later works include: *Empty Pockets* (1915); *Clipped Wings* (1916); *The Thirteenth Commandment* (1916); *In a Little Town* (1917); *We Can't Have Everything* (1917); *The Unpardonable Sin* (1919); *Long Ever Ago*, a volume of Irish stories (1919); *What's the World Coming To?* (1920); *Beauty* (1921); *Souls for Sale* (1922); *Destiny* (1925); *George Washington* (biography, 1926-27). He wrote and directed many motion pictures, including *Scratch My Back* (1920); *The Old Nest* (1921); *Dangerous Curve Ahead* (1921); *The Old Home Town* (1926); *The Patent Leather Kid* (1927).

**HUGHES, THOMAS WELBURN** (1858- ). An American lawyer and teacher, born in Canada and educated there and at the University of Michigan. From 1892 to 1898, he was instructor in law at that university and later served on the faculties of the University of Illinois and Louisiana State University. From 1912 to 1915 he was dean and professor of law at the University of Florida and since 1915 has held similar positions at Washburn College of Law, Topeka, Kans. He was the author of *Hughes on Evidence* (1906); *Hughes on Criminal Law* (1913); *Cases on Evidence* (1920); *Cases on Criminal Law and Procedure* (1921); *Was Jesus Guilty?* (1927); and many pamphlets and magazine articles.

**HUGHES, THE RT. HON. WILLIAM MORRIS** (1864- ). An Australian Premier, born in Wales, who emigrated to Australia in 1884. After his admission to the bar, he devoted himself to the organization of maritime unions, becoming general secretary of the Wharf Laborers and president of other allied unions. He was a Labor member of the Legislative Assembly of New South Wales (1894-1901), resigning to enter the first Federal Parliament (1901), where

he became a leader of the Labor Party. He was Minister of External Affairs (1904), chairman of the Royal Commission on the Navigation Bill, a delegate to the Imperial Navigation Conference (1907), and Attorney General (1908-21, with a break in 1909 and 1913). As Premier from 1915 to 1923, he met with three temporary defeats, two of them during the World War as a result of his attempt to force through conscription. He was a member of the Imperial War Cabinet, spoke in Great Britain and Canada urging united resistance of the Empire to Germany, and was a delegate to the Paris Peace Conference. In 1921 he became Minister of External Affairs again. With W. T. Dick, he wrote *On the Federation of the Australian States* and *The Case for Labor*. In 1929 he published *The Splendid Adventure: a Review of Empire Relations*. Consult Douglas Sladen's *From Boundary Rider to Prime Minister* (1916). See AUSTRALIA.

**HULETT, GEORGE AUGUSTUS** (1867- ). An American chemist, born in Illinois, and educated at Princeton and Leipzig. He was an assistant in chemistry at Princeton, then an instructor at the University of Michigan (1890-1904), and again at Princeton, where in 1909 he became professor of physical chemistry. He was also chief chemist of the Bureau of Mines (1912-13). During the World War, he was a member of the foreign service commission of the Natural Research Council and visited France and England to study the origin and development of scientific activities in connection with warfare. His original investigations were almost entirely in problems of physical chemistry, e.g., isomorphism in precipitates, occlusions in electrodeposits, and decomposition potentials. Since 1923 he has served as associate editor of the *Journal of Physical Chemistry*.

**HULL** (officially, Kingston-upon-Hull). A seaport city of England. The population at the census of 1921 was 287,150; in 1927 it was estimated to be 298,600. Hull is the principal seaport for shipping the manufactures of Yorkshire and Lancashire, the docks extending along the Humber for nearly 7 miles and having a total water area of 247 acres. The largest docks are the King George and the Alexandra, each containing about 53 acres. In 1926 the net tonnage of ships engaged in foreign trade was 4,922,904 for arrivals and 4,517,580 for departures; the value of sea-borne trade in 1924 was £121,186,307. Hull has large warehouses for the storage of wool and factories for the manufacture of soap, lard, and starch. One of its principal industries is the extraction of oil from cottonseed. The Art Gallery, the gift of the Rt. Hon. T. R. Farnes, and the Guild Hall have been recently constructed. In April, 1928, the foundation stone of the new University College was laid by the Duke of York.

**HULL, ALBERT WALLACE** (1880- ). An American physicist. He was born at Southington, Conn., and was graduated from Yale in 1905 (Ph.D., 1909). He was instructor in physics and assistant professor at Worcester Polytechnic Institute (1909-13). Since 1914 he has been research physicist for the General Electric Company at Schenectady, N. Y. He devised a method of X-ray crystal analysis and in 1923 was awarded Potts' Medal by the Franklin Institute for work in that field. He was elected to the National Academy of Sciences in 1929.

**HULL, CORDELL** (1871- ). An American public official (see VOL. XI). He served as a member of Congress, 1907-21 and 1923-29. From 1921 to 1924, he was chairman of the Democratic National Executive Committee. In this capacity, he called to order the Democratic National Convention of 1924 and was chairman of the platform committee at that convention.

**HULL, HARRY EDWARD** (1864- ). An American Congressman and Commissioner General of Immigration. He was born in Allegany County, N. Y., and obtained a public-school education at Cedar Rapids, Iowa. He engaged in the grain business and served, successively, as alderman, mayor, and postmaster of Williamsburg, Iowa (1897-1914). For five terms (1915-25), he represented the 2d Iowa District in Congress. Since 1925 he has been Commissioner General of Immigration.

**HULSE, HIRAM RICHARD** (1868- ). A Protestant Episcopal bishop, born at Middletown, N. Y. and educated in Philadelphia. Ordained in 1896, he was for several years vicar of the Pro-Cathedral in New York and from 1899 to 1912, was rector of St. Mary's Church there. He was also Secretary of the American Church Missionary Society and archdeacon of New York. In 1915 he was consecrated Bishop of Cuba.

**HÜLSEN, CHRISTIAN K. F.** (1858- ). A German historian and archaeologist. He was born in Berlin and studied at the university there under Mommsen. After teaching several years, he was appointed director of the German Archaeological Institute in Rome; in 1917 he became honorary professor at Heidelberg. He received the honorary D.Litt. degree from Oxford and Columbia universities. He is the author of *Die Thermen des Caracalla* (1898); *Forum Romanum* (1904); *Topographie der Stadt Rom in Altertum* (1897); *Die Thermen des Agrippa* (1910); *Il Libro di Giuliano di Sangallo* (1910); *Roms Antikengärten* (1917); *Forum und Palatin* (1926); and a volume on the mediæval churches in Rome, in Italian, *Le Chiese di Roma nel Medio Evo* (1927).

**HUMAN EVOLUTION.** See ANTHROPOLOGY; EVOLUTION.

**HUMBERT, ün'bér', GEORGES LOUIS** (1862-1921). A French general, who was born in Gazaran, entered Saint-Cyr in 1881, joined the army in 1883 and served in Indo-China, Madagascar, and other French colonies. He was in service in Morocco in 1913 and 1914, and was placed in command of the Moroccan division at the outbreak of the World War. Later in 1914, he commanded the 23d Army Corps, and was given command of the 3d Army in 1915. This post he held for three years, with distinguished success. In 1919 he was made governor of Strassburg, a position which he held at the time of his death, and in 1920 a member of the Superior War Council.

**HUNEKER, JAMES GIBBONS** (1860-1921). An American musical and literary critic (see VOL. XI). In 1921 he published *Steeplejack*, largely autobiographical. His death cost American letters one of its most discerning critics whose large and contagious enthusiasms succeeded, more than any other single force, in familiarizing Americans with modern European artistic movements. He was one of the first to write of Gauguin, Ibsen, Wagner, Nietzsche, France, Faguet, Van Gogh, and George Moore. In this sense, possibly he was only a reporter,

but he reported the advent of new genius with discrimination, a rare gift. A representative collection of Huneker's *Essays* with an introduction by H. L. Mencken was published in 1929.

**HUNGARIAN LITERATURE.** Recent Hungarian literature has not been so rich in monumental works as the period of Petöfi, Arany, Jókai, Kemény, Katona, and Madách. In lyrics, novels, and dramas, we have only smaller epigons in the past 20 years, though quite a host of poets and writers arose who enriched the literature with works of permanent value. Most of the first magnitudes in the lyrics are followers of Arany and Petöfi, or at least regard their works as a sacred inheritance of the "Golden Age" of Hungarian literature. Of the older and more conservative generation, Szabolcska (Mihály), Vargha (Gvula), and Yakab (Ödön), are worthy of mention, then Andor Kozma by his poetical name, Miklós Bárd, also, Geza Lampérth. Besides these most popular poets, there are two different groups in recent literature. Two new tendencies became prevalent during the past 20 years. One is the result of a rising admiration of the Western naturalists, more definitely speaking, the French decadents; the other tendency is an outgrowth of the World War or its consequences.

It was at about the close of the nineteenth century that a small group of young poets turned their faces to the West and gathered around their flag. This feeling is expressed in their magazine, *Nyugat* (*The West*). They revolted against the prevailing ideals, as well as the old school, of the rather retrospective and secluded national literature. Their leader and incomparably the most prominent figure in this group was Endre Ady (1877-1919). He had an interesting personality around which a very hot battle was fought, not only while he lived but after his death. Almost a whole library was published, including a host of articles and books that are still appearing, and portray the literary value of his works. Though this so-called Ady problem is an unsolved riddle as yet, owing to the contradictions of his life, as well as of his political attitude and religious thoughts, it is generally accepted that the Hungarian lyrics obtained a real, new strength and tone through his poems. Others of the same school are Mihály Babits, who is at the same time perhaps the best translator of Dante's *Divina Commedia*; and Dezső Kosztolányi, who, besides his original poems of deep feeling, also translated many American, English, French, Italian, and Spanish poems into Hungarian. These were published in three volumes under the title *Modern Poets*. The other tendency in Hungarian lyrics was born in the War and post-war times. Since Hungarians felt no real enthusiasm for the War, no poet arose to inspire its continuation. Yet a few poets were influenced at least by the awful experience which they went through during the terrible catastrophe. The very best known among them is Géza Gyöni, who has been called the "Petöfi" of the World War. His *Letters from the Calvary* were written during his imprisonment in Russia, where he died. Two other volumes of his poems were published during the World War.

Owing to the tragic end of the War for them, the dismemberment of the thousand-year-old country, a very noteworthy group of Hungarian poets arose both in the torn off parts and Hungary proper. The most popular of these irre-

dentist poets are Sándor Reményik (who wrote under the poetic name of "Végváry"), with his poems collected and published under the title *Save Us!*; then, Gyula Diák (anonym), László Mécs, with his *Slaves Are Singing* (Berlin, 1925); Elemérné Papp-Váry, and Lajos Áprily, who enriched the Hungarian literature with poems of permanent value.

In the field of novels, after the long interval of sterility that followed Kemény, Jókai, and Mikszáth, the most important and popular novelist is Ferenc Herczeg, whose works are characterized by an extraordinary variety of subjects and simplicity of style. He is most successful when writing about the middle class of the last century. Géza Gárdonyi also is very famous and widely read to this day, as a novel writer. He has a master hand, especially when dealing with the problems of the intelligentsia of the village life. Móricz Zsigmond, on the other hand, is more interested in the life and tormenting problems of the Hungarian peasants, depicting them often with realism leaning toward dark pessimism. Dezső Szabó also is weeping and lamenting over the tragic fate of the agricultural class of Hungary. Other popular novelists are Margit Kaffka, Renée Erdős (with her characteristic realism), Miklós Surányi, Aurél Kárpáti, István Tömörkényi, Zoltán Ambrus, Gyula Török, Cecil Thormay (some of her works published also in English), Kálmán Csathó, János Komáromy, and Ferencz Móra.

The most important representative of the modern Hungarian drama is Ferenc Herczeg, whose *The Seven Sisters* (*Gyurkovics Lányok*) was the first Hungarian drama on the American stage. Both his historical and social dramas had the best reputation in the theatrical world, not only in Hungary but in other countries. From the standpoint of fame in foreign lands, Ferenc Molnár made a still more wonderful career. His dramas, due to their finely-spun and witty dialogues, became world renowned. *The Devil, Lilium, The Guardsman, Fashions for Men, The Swan*, etc., had uncommon success especially on the American stage. Menyhért Lengyel had almost the same success with his *Typhoon, Sancho Panza, Antonia*, etc.; so had *Fata Morgana*, by Ernő Vajda. Other modern dramatists of good name are Jenő Heltai, Frigyes Karinthy, Sándor Bródy, Zsigmond Móricz, and Lajos Zilahy. In miscellaneous literature, Sándor Pethő's *From Világos to Trianon*, Aladár Schöppfin's work on modern Hungarian writers, Ferencz Zsigmond's *Life and Work of Jókai*, the *Petőfi* of Frigyes Riedl (one of his works published in English), and *The Development of the Hungarian Drama*, by György Lukács are counted among the most successful studies since the World War. Besides these, there are great historical works, namely, *Francis Rákóczi II*, by Sándor Márk, and *The Period of the Árpád Dynasty*, by László Erdélyi; also Jenő Cholnohy's monumental *Geography of America* and the literary studies of György Király.

**HUNGARY.** A republic of Europe from Nov. 16, 1918, to Mar. 23, 1920, when the country was declared a monarchy. The throne, however, was vacant. Under the terms of the Treaty of Trianon, the area of Hungary is 35,875 square miles. It is bounded on the north by Czechoslovakia, on the east by Rumania and Poland, on the south by Jugo-Slavia, and on the west by Austria. The population, according to the census of 1920 was 7,980,143. The estimated popu-

lation on Dec. 31, 1927, was 8,525,725. The principal cities are Budapest with a population of 1,217,325; Szeged, 119,109; and Debreczen, 103,186.

**Agriculture.** Hungary is chiefly an agriculture country. The acreage and yield of the principal crops for pre-war and post-war years was as follows:

CROPS: AREA, PRODUCTION, AND YIELD PER ACRE

Crop	Area (thousands of acres)		Production (thousands of units—bushels, except as indicated)	
	1909—1913 <sup>a</sup>	1927	1909—1913 <sup>a</sup>	1927
Wheat	3,712	4,049	71,493	76,933
Rye	1,608	1,653	31,377	22,569
Barley	1,322	1,011	32,369	23,319
Oats	849	637	28,464	21,717
Corn	2,192	2,589	60,818	68,347
Potatoes	619	626	71,118	66,403
Sugar beets	131	154	1,378 <sup>b</sup>	1,455 <sup>b</sup>
Grapesvines	540 <sup>c</sup>	542	52,771 <sup>c</sup>	51,566 <sup>d</sup>
Tobacco	93	58	112 <sup>e</sup>	60,626 <sup>e</sup>

<sup>a</sup> Within present boundaries

<sup>b</sup> Unit, metric ton

<sup>c</sup> 1911—1915 average

<sup>d</sup> Unit, gallon of must

<sup>e</sup> Unit, pound

According to the census of 1928, the livestock was as follows: horses, 917,974; cattle, 1,811,647; sheep, 1,566,451; pigs, 2,661,539.

**Commerce.** According to figures published in 1929, the trade balance for 1927 showed an excess of imports over exports of \$60,502,000, as compared with an adverse balance of \$14,379,000 in 1926. Imports and exports in 1927 were valued at \$200,345,000 and \$139,843,000, respectively. Similar figures for 1926 were \$166,232,000 and \$151,903,000. The leading articles of imports according to value in 1927 were cotton and woolen fabrics, wood and coal, and iron and steel. The leading articles of export were wheat and wheat flour, cattle, rye, and sugar. The chief suppliers of the imports were Czechoslovakia, Germany, Austria, and Rumania; and the chief purchasers of Hungarian products, Austria, Czechoslovakia, and Germany. In 1928 imports continued to be in excess of exports amounting to 1,188,976,000 pengos, as against 818,711,000 pengos. The average exchange value of the pengo in 1928 was 0.1744.

**Mining and Manufacturing.** The Hungarian production of coal in 1927 totaled 784,000 tons of bituminous and 6,243,000 tons of brown coal. The chief Hungarian industries are those that are allied with the agricultural resources of the country and consist of grain mills, distilleries, sugar refineries, and plants for the manufacture of hemp and flax. Some iron and steel are produced.

**Transportation.** The total length of Hungarian railways, Dec. 31, 1927, was 5388 miles, of which 1897 were owned by the State. Of the total railways, 618 miles are of double track.

The fiscal year ends June 30. Figures in the table (page 756) are on the gross basis; totals include both ordinary and extraordinary items. Actual expenditures by classes for recent years are not available. Conversions to dollars have been made at par inasmuch as the deviations in exchange since the establishment of the pengo in 1926 (par \$0.1749) have been slight.

The total debt on Dec. 31, 1926, according to privately published sources, amounted to \$426,605,000, of which \$235,325,000 represented pre-war debt.



**GOVERNMENT RECEIPTS AND EXPENDITURES**  
(Thousands of Pengos)

	1927-28 budget	1928-29 budget		1927-28 budget	1928-29 budget
<b>Receipts</b>	<b>1,192,422</b>	<b>1,360,261</b>	<b>Expenditures</b>	<b>1,192,255</b>	<b>1,375,804</b>
Direct taxes	160,226	171,500	Debt service	90,038	92,699
Customs	102,187	128,595	National defense	115,148	132,836
Turnover taxes	114,056	119,856	Education	120,800	142,076
Stamps and dues	55,768	86,100	Tobacco monopoly (gross)	64,651	69,810
Tobacco monopoly (gross)	137,040	150,000	Posts, telegraphs, and telephones (gross)	91,460	108,400
Posts, telegraphs, and telephones (gross)	91,460	108,400	State railways (gross)	291,072	308,401
State railways (gross)	290,202	306,630	All other	419,086	502,982
All other	241,483	289,180	Equivalent total (\$1000)	208,525	237,480
Equivalent total (\$1000)	208,555	237,910			

**History.** Under the government of Count Tisza, Hungary participated in the conduct of the World War, unquestioningly so far as the Magyars were concerned, but with reluctance by the other nationals. The death of the aged Emperor Francis Joseph (Nov. 21, 1916) loosed all those dissident forces which had yielded only a reluctant allegiance. The independent spirit of the Prime Minister quickly antagonized the new King, who, listening to the counsels of the court cabal, dismissed Tisza in May, 1917. Weaker men assumed control, with the result that the country was rent by political dissensions. Count Esterhazy became Premier for a time but was soon succeeded by Herr Wekerle. The agitation over the extension of the political franchise attracted attention away from more pressing concerns, with the result that the hardships of the civil population increased with the failure of the Government to buy up the harvests, etc. All the familiar customs were now to go down before the new revolutionary spirit that gripped the Hungarian people as the War dragged on. The demand for reform became increasingly insistent and gained importance from the personal prestige of Count Karolyi who had assumed leadership of the forces of discontent. His hand was strengthened by the royal manifesto of Oct. 16, 1918, which was tantamount to a dissolution of the Dual Monarchy. Thenceforth, Hungary went her separate way. Believing that Karolyi was in a position to gain more favorable terms from the Allies, Hungarian statesman yielded to his advice and on Oct. 25, 1918, formed a National Council. Five days later, Karolyi was summoned to head it as Minister-President. In accordance with his liberal, nay, republican professions, he recalled the Hungarian troops from the front and viewed with complacency the formation of workers' and soldiers' councils in Budapest. The revolution took a more violent character when, on October 30, Count Tisza, the leading representative of the old régime, was killed. On November 16, the National Council proclaimed Hungary a republic; on Jan. 11, 1919, it elected Karolyi provisional President. Karolyi's hopes that his anti-war and republican sentiments might serve to gain more favorable peace terms for Hungary received a rude check when a new armistice deprived Hungary of large territories in favor of Rumania and Serbia. This setback, the invasion of Hungarian lands by Rumanian and Czech troops, the increasing war-weariness that made any régime other than the one in power desirable, the growing turbulence of the workers, and the example of the successful Russian Revolution, united to undermine the Government. Karolyi, with more prudence than courage, yielded up his post, and on Mar. 22, 1919, Hungary became a Soviet Republic dominated by an

alliance between the Social Democrats and the Communists, the only well-organized parties.

From March 22 to August 1, the doctrine of the dictatorship of the proletariat ruled the distracted country. Alexander Garbai became President of the Republic, though the actual ruler was Béla Kun, commissary for foreign affairs, and friend of Trotsky and Lenin. Other leaders were Szamuelly, Pagany, Böhm, and Varga. Initial measures were rigorous. The revolutionary government council proclaimed the socialization of large properties, mines, industries, banks, and other commercial institutions. All ranks and titles were abolished and church and state separated. A strict censorship of the press was imposed. Money was sent into Vienna in an attempted to spread the Bolshevik propaganda there. The middleman was singled out for attack; all raw materials were made a state monopoly. For the conciliation of the peasantry, private property in holdings of 100 acres or less was permitted.

The career of the Soviet Republic was short. The closing of the factories for want of materials stirred the workers into hostility, while the persecutions of the church and the placement of Jews in high offices antagonized the devout peasants. The nobility was naturally embittered and intrigues soon led to the formation of a counter-government with an army recruited by Vice Admiral Horthy. Béla Kun's failure to come to an understanding with the Supreme Council's representative, General Smuts, and his policy of militant opposition to Hungary's enemies, hastened his downfall. His Red Army was soon at war with the troops of Rumania, Jugoslavia, and Czechoslovakia. An initial victory against the Czechs brought down the wrath of the Supreme Council on Béla Kun, and Hungary was threatened with military and economic reprisals. To conciliate the Peace Conference, Béla Kun withdrew his forces from the conquered Slovak territory, only to be confronted by an advancing Rumanian Army on the east. Resistance was useless; the Rumanians advanced on the capital with the tacit consent of the Allies; and beset by obstacles everywhere, the Soviet government resigned and took refuge in flight, finding a haven first in Vienna and later in Russia.

A White government, except for a brief interval, now succeeded the Reds. As a result of the intercession of the Allies, a moderate Social Democratic government was at once overthrown on August 7, and the reactionary Archduke Joseph was set up as regent of the state with Herr S. Friedrich as premier. All interest was diverted from internal affairs in the face of the advancing Rumanian Army: On August 3, after having pillaged the countryside, the Rumanians entered the suburbs of Budapest; on August 5,

against the injunction of the Supreme Council, the army took the city; on August 6, an ultimatum was served on the Hungarians demanding 30 per cent of the harvest, farm animals, and farm tools, 50 per cent of the rolling stock, and the equipment for an army of 300,000 men. Not until after they had stripped the country bare did the Rumanians yield to the reiterated remonstrances of the Allied Supreme Council and quit the capital, November 11, and the country entirely, February, 1920. Meanwhile, reaction was in the saddle. Archduke Joseph, at the order of the Allies, was compelled to quit the regency only to be succeeded by the virtual rule of Admiral Horthy backed by his White army. For a time, Friedrich stayed on as premier; he was succeeded for another brief period by Herr K. Huzzár. A rapid succession of ministers during 1920-21 availed the country nothing in view of the economic demoralization, the hostility of her neighbors, and the loss of the rich agricultural territories of the Banat, the Bačka, and the Little Alföld.

On Jan. 25, 1920, a general election chose delegates to the National Assembly. Hostility toward the Socialists accounted for heavy victories for the parties of the Right. In March, Admiral Horthy was formally chosen regent, the step being dictated by the antagonism of the Little Entente toward the creation of a monarchy. An indication of the bitterness of the reaction was revealed in the obstructions placed in the way of the trade unions' participation in politics. To lift such discriminations, the International Federation of Trade Unions ordered an economic boycott against Hungary and Hungarians retaliated by boycotting Austria. Demonstrations against the Jews occurred frequently and even the Government participated by restricting the number of Jewish students in the universities. Monarchist sentiment continued to prevail, and on Mar. 26, 1921, believing that the country favored his accession, the ex-King Charles suddenly appeared, to ascend the throne. The Regent refused to countenance his restoration, with the result that Charles left for Switzerland, only once more to appear in Hungary on October 22. The hostility of the Little Entente again proved disastrous for his hopes, with the result that Charles was compelled to surrender himself to the British and suffer internment on the island of Madeira which he reached November 19, and where he died, Apr. 1, 1922, of pneumonia.

The international situation, possibly more than any other single factor, contributed to the prevailing hopeless temper. On June 4, 1920, a Hungarian peace delegation, of which Count Albert Apponyi was the chief, was compelled to sign away, by the Treaty of the Trianon, at least two-thirds of the former Hungarian kingdom to the new succession states. Hungarian groups were left in Czechoslovak, Yugoslav, and Rumanian districts, while the new frontiers cut across railways, roads, waterways, and long-established administrative units. In the Bačka and the Banat, rich maize and wheat lands were lost, and in the Little Alföld north of the Danube, barley and sugar-beet fields, and pastures. With the cession of the Carpathian and Transylvanian country, Hungary saw taken from her all her salt deposits, four-fifths of her iron ore and many coal fields, as well as her sources of water power and a large share of her valuable forests. The continued hostility

of the Little Entente prevented the formulation of an economic accord between Hungary and those territories upon which her industries so much depended. In August, 1921, Hungary's burdens were increased by the cession of the Burgenland to Austria, at the bidding of the Allies.

The events of 1922 and 1923 proved how profoundly Hungary was shaken by her unhappy economic and political status. The Republic was continually being threatened by the agitations of the royalists, headed by Counts Andrássy and Apponyi, who proclaimed Prince Otto heir to the throne after the death of Charles. Horthy, quite as reactionary as the royalists, attempted to reduce the electorate by one-fourth, and to substitute open voting for secret. A rigorous censorship of the press was maintained which applied, too, to the publication and circulation of the writings of such men as Marx, Lenin, and Walt Whitman. A move was originated for the practical suppression of the civil liberties, its purpose being the imprisonment or banishment of all those suspected of questioning the prevailing political, economic, and religious beliefs. Two disturbing factors were also evident in 1923; that the courts had become the mere instruments of the authorities and that conscription had been practically restored. The populace was daily irritated by the presence of the Inter-Allied Commission of Military Control which was being maintained at Hungary's expense. Anti-Semitism was on the increase and Hungarian Fascists were being recruited. Nothing indicated better the broken *morale* of the people than the ease with which lawless bands incessantly operated. The most powerful, led by one Hejjas, terrorized Jews, trade unionists, and Communists, and led forays into the Burgenland in the summer of 1922. Attempts to suppress them legally were unavailing. Liberals in other countries believed that Hungary had been given over to a "White Terror," which was characterized by reactionary violence as cruel, perhaps, as any revolutionary terrorism.

The deplorable economic and financial situation resulting from the War and, hardly less, from civil turmoil and territorial transfers after the War, presented so grave an international problem that in December, 1923, at the instance of Czechoslovakia, the League Council proposed to undertake the financial rehabilitation of Hungary on a basis similar to that which had proved so successful in Austria. In return for an international loan of 250,000,000 gold crowns, floated under the League's auspices, Hungary was to accept League supervision of her finances, assign to the League the revenue from customs and state monopolies, abide by the terms of the Treaty of Trianon, and pay the war indemnity in 20 annual installments of 10,000,000 gold crowns. Humiliating as they were to Hungarian Nationalists, these terms were accepted by Premier Bethlen in February, 1924, and an American banker, W. P. G. Harding, was invited by the League to act as its Commissioner General in charge of Hungarian finances. On Mr. Harding's refusal, the post was accepted by Jeremiah Smith of Boston, who was cordially received in Budapest, May 1. Meanwhile, despite stubborn Socialist opposition, Premier Bethlen had carried through Parliament, April 18, a series of bills authorizing his government to fulfill the agreement.

With the path thus cleared, the plan was immediately put into effect. A new bank of issue was opened June 2 and shortly thereafter an international loan of about \$50,000,000 was floated, chiefly in England and America. It was secured by revenues from the customs, from the State tobacco and salt monopolies, and from the sugar tax. These revenues proved unexpectedly large and together with proceeds from new and heavy taxes quickly brought the national finances to a good position. Early in 1925, Mr. Smith was able to report that although two and a half years had been allowed for balancing the budget, the task was actually accomplished in six months. It was necessary to use only a part of the international loan. After two years of operation, the plan had fully restored the financial health of the country and at the end of June, 1926, Mr. Smith resigned, giving his two years' salary of \$100,000 to Hungary's poor. League control was accordingly brought to an end.

Attempts to negotiate commercial treaties with Hungary's neighbors met with only limited success, because, as alleged, of the mistrust of Hungary's reactionary government and of the Fascist factions. This reactionary spirit was manifested in many ways. In 1925 Count Bethlen, the Premier, forced through a new election law abridging the right of suffrage and providing for open instead of secret voting. In September, 1925, large numbers of Communists were arrested without conclusive evidence to support the charge of plotting against the Government. It was constantly charged by the opposition that the courts were unusually severe in dealing with liberals and radicals, but very tender toward Fascists and other reactionaries. A source of continuing disorder rising occasionally to the point of bloodshed was the militant anti-Semitism fostered by the Fascists and by secret organizations. It found expression in a national law limiting the number of Jewish students at the various universities. When the League of Nations objected to the law as a violation of the treaty clause relating to the rights of minorities, it was slightly modified, but Jewish students were driven by violence from the universities.

Had it not been that the Conservative extremists were divided into two factions, they might have carried their cause much farther. One of these factions was the Legitimist Party, supporting the claim of the young Otto, son of the late Emperor Charles, to the throne. The other, composed of Fascist elements largely, backed Archduke Albrecht, and became so strong in 1925 that they threatened the establishment of a Fascist dictatorship; but in December and January, they received a severe blow which for the time being effectively silenced them. A huge counterfeiting scheme involving the forging of French francs was uncovered, and it was disclosed that all the leading actors were closely connected with Fascist and Royalist factions. When brought to trial in May, they pleaded the patriotic motive of revenge against France. Although Count Bethlen himself was not proved to be implicated, the Government was not unsympathetic toward the offenders and they received light sentences.

The sensational plot and its aftermath had violent political repercussions, both at home and abroad, but Count Bethlen weathered the storm and indeed profited by it. With the Fascists in a chastened mood, he became practically a dictator. In November, 1926, Parliament

passed a law reviving the Upper House, which was made to consist of 240 members representing and chosen by the nobility, the churches, the business and professional interests, etc., with limited legislative powers. In December, Count Bethlen had so consolidated his power that he deemed it safe to call new elections. Amid charges of government corruption and intimidation, the elections were held and resulted in an overwhelming victory for the Premier, who could count on controlling nine-tenths of the members of the Lower House. Parliament thereupon became hardly more than an agency for carrying out the will of the Government. In March, 1927, it ratified a treaty of arbitration and friendship with Italy, marking a rapprochement with that country which was to be continuously in evidence in following years. A commercial treaty with Czechoslovakia was likewise ratified. Early in 1928, a flurry was caused throughout Europe by the discovery of a disguised shipment of machine-gun parts from Italy to Hungary. When the League and the powers moved to investigate, the material was destroyed and the affair blew over.

Chief among the questions which agitated the public mind of Hungary at this period were the continued insistence on a revision of the Treaty of Trianon, a matter especially close to the heart of the Premier, and the restoration of the monarchy. The latter question became especially prominent on Nov. 20, 1928, when Archduke Otto became of age. In October Count Bethlen, who opposed the Legitimists, predicted an early referendum to determine the form of government; but in May, 1929, he asserted that the existing situation was satisfactory and would probably continue as long as the Regent, Admiral Horthy, lived. On June 12, 1929, Count Andrássy died. He was a leader of the Legitimists and had long been an outstanding figure in Hungarian national life.

See also LITTLE ENTENTE; BURGENLAND; BANAT; TRANSYLVANIA; FIUME-ADRIATIC CONTROVERSY, HUNGARIAN LITERATURE.

**HUNGERLAND**, HEINZ F. W. (1873- ). A German writer, born at Bremen and educated at the universities of Greifswald, Göttingen, Kiel, and Münster. He traveled in England and Scandinavia, did some work at the universities of London, Copenhagen, and Lund, and was instructor at Lund. He specialized in Old German language and Old Norse Literature. He is the author of *Zeugnisse zur Wölsung- und Nibelungensage aus der Skaldenpoesie* (1903); *Das Wissenschaftliche Studium der Deutschen Sprache* (1906); *Deutschland und die Deutschen* (1913); *Siegrunen, Kriegsgedichte* (1915); *Die Volkshochschule, Deutschlands Rettung* (1919); *Herkunft und Bedeutung des Hakenkreuzes* (1921); *Spuren altgermanischen Götterdienstes in und um Osnabrück* (1924); *Die Osnabrücker Mäusesage* (1924); *Die Sage von der Ankumer Totenmette im Lichte der Volkskunde* (1925); *Die Volkskunde eine Hilfswissenschaft der Geschichte* (1926); *Auslandstum und Heimatbewegung* (1927). He also compiled an anthology of Scandinavian lyrics, which he had translated.

**HUNSAKER**, JEROME C. (1886- ). An American aeronautical engineer, born in Creston, Iowa, and educated at the Naval Academy and the Massachusetts Institute of Technology. He studied aerodynamics in Europe and in 1914-16 was instructor at the Massachusetts Institute

of Technology in that subject. He translated much of Eiffel's work, including *Resistance of the Air*, and built the first wind tunnel at the Institute where original research was conducted, the results of which were given to builders. Under him, graduate students were trained as aeronautical engineers. Commander Hunsaker was in charge of the aircraft division of the Bureau of Construction and Repair of the Navy Department, 1916-23. He designed the first modern airship produced in the United States, as well as the *O* and *D* class Navy airships. He also designed the *NO* flying boats with Westervelt and Richardson. In 1917 he was a member of the joint Army and Navy Technical Board to frame an aircraft programme and in 1918 was attached to the Inter-Allied Naval Armistice Commission. Later, he became affiliated with the Bell Telephone Laboratories in New York. Among his published works are *Stable Biplane Arrangements*; *Aerodynamic Properties of the Triplane*; and *Aéroplane Stability*.

**HUNT, CLARA WHITEHILL** (1871- ). An American librarian, born at Utica, N. Y. She graduated from the New York State Library School in 1898 and for several years taught in the public schools. In 1898 she organized the work with children in the Apprentices' Library in Philadelphia and from that year to 1902 was with the Newark Free Public Library. In 1903 she became superintendent of the Children's Department of the Brooklyn Public Library. She lectured much on library topics and was the author of *What Shall We Read to the Children?* (1915); *About Harriet* (1916); *The Little House in the Woods* (1918); and *Peggy's Playhouse* (1924).

**HUNT, EDWARD EYRE** (1885- ). An American sociologist, born in Nebraska and educated at Harvard. From 1912 to 1914, he was on the editorial staff of the *American Magazine* and was also war correspondent in Europe. From 1914 to 1916, he was American delegate of the Commission of Relief to Belgium in charge of the province of Antwerp. He was a director of publicity for the American Red Cross in 1917 and was head of the economic rehabilitation work of the Red Cross in France in the year following. In 1920 he was a member of the engineers' commission on the elimination of waste in industry. In 1921 he acted as secretary of the conference on unemployment and in the following year, as secretary of the U. S. Coal Commission. His published writings include *War Bread—A Personal Narrative of the War and Relief in Belgium* (1916); *Tales from a Famished Land* (1918); *Waste in Industry*, with Herbert Hoover and others (1921); and *Conferences and How to Run them* (1925). He was also co-author of *Business Cycles and Unemployment* (1923) and *Seasonal Operation in the Construction Industries* (1924). He edited *Scientific Management Since Taylor* (1924) and *What the Coal Commission Found* (1925).

**HUNT, GEORGE WILEY PAUL** (1859- ). An American public official and diplomat, born at Huntsville, Mo., and educated in the public schools. For several years he was engaged in ranching in Arizona. In 1893 he was elected a member of the Legislature of that State and of the Senate in 1897 and was reelected for several terms. He was president of the Constitutional Convention (1910) and in 1911 was elected first Governor of the State of Arizona. He was reelected for terms from 1915 to 1919 and was

meanwhile United States Commissioner of Conciliation to negotiate settlement of the miners' strike in Arizona (1917). In 1920 he served as Minister to Siam, resigning in the following year. He was again elected Governor of Arizona in 1922 and for successive terms until 1929. In 1927 he was elected chairman of the Arizona-Colorado River Commission.

**HUNT, HENRY THOMAS** (1878- ). An American lawyer, born at Cincinnati and educated at Yale and the Cincinnati Law School. Admitted to the Ohio bar in 1903, he took an active interest in civic and State politics and was a member of the Ohio House of Representatives, 1906-07. From 1908 to 1911, he was prosecuting attorney of Hamilton County and from 1912 to 1914, mayor of Cincinnati. During the World War, he served in France and as a member of the War Department Claims Board in Washington. In 1920-21 he was a member of the Railroad Labor Board.

**HUNT, THOMAS FORSYTH** (1862-1927). An American agriculturist, born at Ridott, Ill., and educated at the University of Illinois. He was assistant agriculturist for the Illinois Agricultural Experiment Station, 1888-91, on the faculty of the Pennsylvania State College as professor of agriculture, 1891-92, professor of agriculture at the Ohio State University, 1893-96, and dean of the College of Agriculture and Domestic Science there, 1896-1903. He was professor of agronomy at Cornell University from 1903 to 1907 and dean of the School of Agriculture and director of the Pennsylvania Agricultural Experiment Station of the Pennsylvania State College from 1907 to 1912. In the latter year, he became professor of agriculture and dean of the College of Agriculture at the University of California. Until 1919 he was also director of the Agricultural Experiment Station at that university. Professor Hunt wrote: *History of Agriculture and Rural Economics* (1899); *How to Choose a Farm* (1906); and *Farm Animals*, with Charles W. Burkett (1917).

**HUNTER, GEORGE LELAND** (1867-1927). An American art authority (see VOL. XI). During the last fifteen years of his life, he published *Inside the House That Jack Built* (1914); *Italian Furniture and Interiors* (1917); *Decorative Textiles* (1918); *Decorative Furniture* (1923); *Practical Book of Tapestries* (1925); *Tapestries of Clarence H. Mackay* (1925); and contributed to the magazines many articles on related subjects.

**HUNTER, WALTER SAMUEL** (1889- ). An American psychologist, born at Decatur, Ill., and educated at the universities of Texas and Chicago. He taught at the University of Texas from 1912 to 1916 and from 1916 to 1925 at the University of Kansas. Since 1925 he has been G. Stanley Hall professor of genetic psychology at Clark University, Worcester, Mass. From 1916 to 1924 he was associate editor of the *Psychological Bulletin*, and since 1921, of the *Journal of Comparative Psychology*. He was the author of various studies in animal behavior, space perception, and social psychology. His best known work is his textbook, *General Psychology* (1919; revised, 1923). He also has edited *Comparative Psychological Monographs*, *Psychological Index*, and *Psychological Abstracts*.

**HUNTER, (WILEY) ROBERT** (1874- ). An American sociologist, born at Terre Haute, Ind., and educated at the University of Indiana. He was for several years an official of the Chicago Bureau of Charities and a resident at

Hull House from 1899 to 1902. After doing settlement work in England, he became head worker at the University Settlement of New York City in 1902-03. From 1902 to 1906 he was chairman of the New York Child Labor Committee. He was president of the Berkeley Commission of Public Charities in 1921. His books include: *Tenement Conditions in Chicago* (1901); *Poverty* (1904); *Violence and the Labor Movement* (1914); *Labor and Politics* (1915); *Why We Fail as Christians* (1919); *The Links* (1926). He was lecturer on economics and English at the University of California (1918-22).

**HUNTER, WILLIAM** (1861- ). A British physician, credited with priority in the recognition of buccal infection (oral sepsis) as an extensive cause of disease (neuritis, anemia, etc.). His announcement of this doctrine appeared in 1901, years before that of Billings and others in the United States. After studying at the University of Edinburgh, he spent several years as a research student at Cambridge. He then became associated with Charing Cross Hospital and was dean of the medical school there, 1910-15. He was also physician to the London Fever Hospital and in 1915 was sent by the British government to Serbia to study the epidemics of typhus and relapsing fever. Serbia recognized his work by making him a grand officer of the Order of St. Sava. His major writings comprise *Pernicious Anæmia* (1901), expanded in 1909 to *Severest Anæmias*. He also wrote *Historical Account of Charing Cross Hospital and Medical School* (1914); *The Great Serbian Epidemic of Typhus* (1919); and *Nervous Disorders in Anæmias* (1922).

**HUNTER COLLEGE OF THE CITY OF NEW YORK.** A college of liberal arts established in 1870 for the education of women. It is supported by public funds; tuition, textbooks, and other supplies are furnished without cost to the students; the degrees of A.B., A.M., B.S. in Education, and M.S. in Education are offered; and summer, evening, and extension sessions, in which courses of college grade are conducted, are partially supported by the payment of small matriculation and tuition fees. The student enrollment in the regular day sessions increased from 1400 in 1915 to 5204 in 1928, and the teaching staff from 121 to 335 members. The summer session increased from 894 students and 55 instructors in 1923, to 3190 students and 125 instructors in 1928. The evening and extension sessions increased from 3265 students and 110 instructors in 1924, to 7775 students and 273 instructors in 1928. New buildings to accommodate 12,000 students were in process of construction in the Borough of the Bronx in 1928. James M. Kieran, LL.D., who became acting president on Feb. 1, 1928, following upon the resignation of Dr. George S. Davis, was elected president and assumed office on Feb. 1, 1929.

**HUNTING, GEORGE COOLIDGE** (1871-1924). A Protestant Episcopal bishop, born at Milwaukee. He studied theology at the Virginia Theological Seminary and was ordained in 1897. For several years, he was engaged in missionary work in Nevada and Utah and from 1899 to 1902 was rector of St. Paul's Church at Evanston, Wyo. For the five years following, he was superintendent and chaplain of St. Mark's Hospital at Salt Lake City and again engaged in missionary work until 1914, when he was consecrated Bishop of Nevada. From 1909 to 1911, he was editor of the *Nevada Churchman*.

**HUNTINGTON, ANNA HYATT.** See HYATT, ANNA VAUGHN.

**HUNTINGTON, EDWARD VERMILYE** (1874- ). An American mathematician, born at Clinton, N. Y., and educated at Harvard and in Europe. In 1901 he joined the faculty of Harvard, where he became in 1919 professor of mechanics. His scientific work has had to do with various systems of postulates forming the bases of elementary mathematical theories. He was editor of *Annals of Mathematics* during 1902-11 and was president in 1918 of the Mathematical Association of America. In addition to editing various scientific memoirs and works, he is known as author of *Four-Place Tables of Logarithms and Trigonometric Functions* (1907); "The Fundamental Propositions in Algebra," the fourth in *Young's Mathematical Monographs* (1911); *Essentials of Elementary Dynamics* (1916); *The Continuum and other Types of Serial Order* (1917); and *Handbook of Mathematics for Engineers* (1918).

**HUNTINGTON, ELLSWORTH** (1876- ). An American geographer and educator (see Vol. XI). From 1910 to 1915, he was assistant professor of geography at Yale and after 1917 was research associate. During the World War, he served as captain of the Military Intelligence Division. His later books include *The Climatic Factor* (1914); *Civilization and Climate* (1915); *World Power and Evolution* (1919); *The Red Man's Continent* (1919); and *Principles of Human Geography*, with S. W. Cushing (1920); *The Character of Races* (1924); *West of the Pacific* (1925); *The Pulse of Progress* (1926); and *The Human Habitat* (1928). With Leon F. Whitney executive secretary of the American Eugenics Association he wrote *The Builders of America* (1928).

**HUNTINGTON, GEORGE SUMNER** (1861-1927). An American surgeon and anatomist, born at Hartford, Conn. He received his A.B. degree at Trinity College in 1881 and his M.D. degree at the College of Physicians and Surgeons, Columbia University, New York, in 1884. He was professor of anatomy at Columbia (1889-1927) and American editor of the *Journal of Anatomy and Physiology* during the same period. His chief publication was a large work on the surgical anatomy of the peritoneum.

**HURD, HENRY MILLS** (1843-1927). An American physician and psychiatrist, born in Union City, Mich. (see Vol. XI). He remained editor of the *Modern Hospital* and also one of the editors of the *American Journal of Insanity* until 1920. He also edited a four-volume work, *Institutional Care of the Insane in the United States and Canada* (1917).

**HURLBUT, JESSE LYMAN** (1843- ). An American clergyman and writer (see Vol. XI). His later books include *Traveling in the Holy Land through the Stereoscope* (1913); *Hurlbut's Story of Jesus* (1915); *Story of the Christian Church* (1918); and *The Story of Chautauqua* (1921).

**HURLEY, EDWARD NASH** (1804- ). An American manufacturer and public official, born in Galesburg, Ill. He was educated in the public schools of Chicago, served as engineer and traveling salesman for several companies, and organized and developed the pneumatic tool industry in the United States and Europe. From 1908 to 1915, he was president of the Hurley Machine Company of Chicago. In 1913 he was appointed trade commissioner to the Latin-American re-



publics and served as vice chairman and later as chairman of the Trade Commission until 1917, when he was appointed chairman of the United States Shipping Board and president of the Emergency Fleet Corporation. This post he resigned in 1919. Since 1924 he has been a member of the World War Funding Commission. He wrote *The Awakening of Business* (1916); *The New Merchant Marine* (1920); and *The Bridge to France* (1927).

**HURRICANES.** See METEOROLOGY.

**HURST, FANNY** (MRS. JACQUES S. DANIELSON) (1889- ). An American author, born in St. Louis, and educated at Washington and Columbia universities. Her short stories were an immediate popular success. Collected in book form, they include *Gaslight Sonatas* (1916); *Humoresque* (1918); and *The Vertical City* (1921). An early novel, *Star Dust* (1919), won little attention. Her *Lummo* (1923), at once raised Miss Hurst to the front rank of American fictionists. Undoubtedly showing the influence of May Sinclair, *Lummo* nevertheless presents the working of a mature and confident mind. Miss Hurst wrote *The Untamed Lady* (1926), as a photoplay. *A President Is Born*, regarded by many critics as her most important novel, appeared in 1928, and *Five and Ten* in 1929.

**HUSE, HARRY McLAREN PINCKNEY** (1858- ). An American naval officer, born at West Point, N. Y. He graduated from the United States Naval Academy in 1878 and was appointed ensign in 1882. In 1905 he served as professor of mathematics at Annapolis and was promoted to be commander in 1907, captain in 1909, and rear admiral in 1916. In 1919 he served as commander of the Atlantic Fleet Train and was on special duty in London and Paris. In 1920 he commanded the United States naval forces in European waters, with the rank of vice admiral, and from July 26, 1921, to Dec. 3, 1922, when he was retired, was a member of the General Board of the Navy.

**HUSSEIN IBN ALI**, hōōs-sūn' ib'n il'ā, (1856- ). First King of the Hedjaz, who was recognized by the Mohammedans as senior descendant of Mohammed. From 1800 to 1908, he was a prisoner at Constantinople, where he gave his four sons, Ali, Abdullah, Feisal, and their half-brother Zaid, a modern education. After the Turkish Revolution of 1908, he was appointed Grand Sherif of Mecca, and gained great influence over the Arab troops. He refused to proclaim a Holy War on behalf of Germany and was invited by societies in Syria and Mesopotamia to lead an Arab revolt. He subsequently took the side of the Allies and rendered efficient service with the British troops in Arabia and Mesopotamia. In recognition of these services, he was proclaimed King of the Hedjaz on Oct. 29, 1916, and King of Arabia on June 21, 1917. With the assistance of Great Britain, he established and maintained a well-organized government in his new kingdom, which was recognized by the Allies. In 1924 he refused to sign a treaty with Great Britain because the status of Jerusalem was not satisfactory to him. On Mar. 7, 1924, he was proclaimed Caliph. An invasion of the Wahabis under Ibn Saud in September, 1924, caused his abdication both as Caliph and King on October 4 of that year. His son ALI IBN HUSSEIN (1878- ), ruled for a year, but was defeated and succeeded in December, 1925, by Ibn Saud. See CALIPHATE and ARABIA, History.

**HUSSEY, WILLIAM JOSEPH** (1862-1926). An American astronomer, born at Mendon, Ohio, and educated at the University of Michigan. During 1884-89 he was principal of various schools in Ohio and Illinois and in the latter year went to the University of Michigan as an instructor of mathematics; in 1891, he became acting director of the Detroit Observatory; and a year later, went to Stanford University, where in 1894 he became full professor. During 1896-1905 he was astronomer at the Lick Observatory, but in 1905 returned to Michigan where he became professor of astronomy and director of the observatory. Dr. Hussey was director of the Argentina National Observatory at La Plata (1911-17), of the Lick Eclipse Expedition to Egypt in 1905, and of La Plata Eclipse Expedition to Brazil in 1912. He discovered more than 1600 double stars; in recognition of this achievement, he received the Lalande Prize of the French Academy in 1906. In addition to many minor contributions to scientific journals, he was the author of *Logarithmic and Other Mathematical Tables* (1891, 1895); *Mathematical Theories of Planetary Motions* (1892); and *Micrometrical Observations of the Double Stars Discovered at Pulkowa* (1901).

**HUTCHESON, ERNEST** (1871- ). An American pianist, born at Melbourne, Australia. He received his first instruction there from Max Vogrich and was exhibited as a wonder-child at the age of five. After graduating from the Leipzig Conservatory, where he had been a pupil of Reinecke, he studied for some time with Stavenhagen in Weimar. During the next 10 years, he devoted himself mainly to teaching. After a successful tour of Germany and Russia in 1900, he came to the United States, where he taught at the Peabody Conservatory in Baltimore until 1912. His second European tour (1912-14) established his reputation as one of the foremost contemporary pianists. At the conclusion of this tour, he returned to the United States, making his home in New York. In the season of 1924-25, he attracted attention with a remarkable historical cycle of seven recitals, presenting 112 compositions, illustrative of the development of piano music from the sixteenth century to the present day. In 1927 he was appointed dean of the Juillard Foundation of New York. He composed *Symphonic Suite: Piano Concerto: Symphonic Poem* (produced in Berlin); *Two-Piano Concerto* (world premiere, 1926, Philadelphia); *Symphony; Violin Concerto*, and many piano pieces.

**HUTCHESON, GROTE** (1862- ). An American soldier, born in Cincinnati, Ohio. He graduated from the United States Naval Academy in 1884, served in the Spanish-American War and in various commands in the Regular Army, and became colonel of cavalry in 1916. He was made brigadier general in the National Army in 1917. In 1918 he created and organized ports of embarkation at Newport News and Norfolk, Va. He was promoted to be brigadier general in the Regular Army in 1920, was on duty in and around New York City in 1921-23, and at Schofield Barracks, Hawaii, 1923-24, and was made a major general and retired in July, 1924. He was awarded the Distinguished Service Medal for specially meritorious service in the administration of the Port of Embarkation. He saw service, during his career, against the Indians, and in Porto Rico, China, and the Philippines.

**HUTCHINS, ROBERT MAYNARD** (1899- ). An American university president, who was born in Brooklyn, N. Y., and studied at Oberlin and Yale (A.B., 1921; LL.B., 1925). He was master of English and history at Lake Placid (N. Y.) School (1921-23), secretary of Yale University (1923-27), lecturer in the Yale Law School (1925-27), acting dean (1927-28), and professor of law (1927-29). During the World War, he was in the American Ambulance Service, and with the Italian Army. He was decorated with the Croce di Guerra of Italy. In April, 1929, in his thirty-first year, he was appointed president of the University of Chicago.

**HUTCHINSON, ARTHUR STUART MONTETH** (1880- ). An English novelist, born in India, the son of a British army officer, and educated on the Isle of Thanet, Kent. He studied medicine at St. Thomas's, but gave it up to become a journalist, rising to be editor of the *Daily Graphic* for four years, before serving in France for four more. *If Winter Comes* (1921) was his first popular success. Other works were *Once Aboard the Lugger*, a humorous book (1908); *The Happy Warrior* (1912); *The Clean Heart* (1914); *This Freedom* (1922); *The Eighth Wonder and Other Stories* (1923); and *One Increasing Purpose* (1925).

**HUTIER, OSKAR E. VON** (1857- ). A German soldier, born near Erfurt. In the German advance in France in 1914, he commanded the Prussian Guards and was one of the most aggressive and skillful of the German leaders in that movement. In 1915 he was given command of the 21st Army Corps and in 1917 commanded Army Group D. Later in the same year, he was assigned as commander of the 8th Army, and, with this, occupied Riga. He was transferred to the 18th Army on the western front and took an important part in the great German advance which began in March, 1918.

**HUXLEY, ALDOUS (LEONARD)** (1894- ). An English author, son of Leonard, and brother of Julian Huxley, who was educated at Eton and Balliol, Oxford. He entered journalism, writing for *The Athenaeum* (1919-20), and *The Westminster Gazette* (1920-21). His published works include poems, essays, and novels. The better known are *Limbo* (1920); *Leda* (1920); *On the Margin* (1923); *Little Mexico and Other Stories* (1924); *Along the Road* (1925); *Jesting Pilate* (1926); *Essays Old and New* (1926); *Proper Studies* (1927); *Point Counter Point* (1928); *Diverse Laws* (1928); also the novels, *Crome Yellow* (1921); *Mortal Coils* (1922); *Antio Hay* (1923); and *Those Barren Leaves* (1925). Possessed of a lively wit and a feeling for the unusual, his characters were vivid, his situations piquant, and his intelligence mordant and unrelenting.

**HUXLEY, JULIAN SORELL** (1887- ). A British biologist and writer, son of Leonard and brother of Aldous Huxley (q.v.). He was educated at Eton and Balliol College, Oxford, was lecturer in zoology at that College (1909-11), and traveled in Germany as research associate of Rice Institute (1911-12). He then spent four years in the United States as assistant professor at Rice Institute, Houston, Texas, did war service in England and as staff lieutenant at G.H.Q. in Italy (1916-18), and in 1919 became a fellow of New College and senior demonstrator in zoology at Oxford University. In 1921 he was a member of the Oxford University Expedition to Spitzbergen and, from 1925 to 1927, was

professor of zoology at King's College, London, becoming honorary lecturer there in the latter year. In 1926 he became president of the National Union of Scientific Workers and Fullerian professor of physiology in the Royal Institution. Besides articles for periodicals, he wrote *The Individual in the Animal Kingdom* (1911); *Essays of a Biologist* (1923); *The Stream of Life* (1926); *Essays in Popular Science* (1926); *Religion without Revelation* (1927); and, with J. B. S. Haldane, *Animal Biology* (1927).

**HUXLEY, LEONARD** (1860- ). An English writer and Greek scholar, eldest son of Thomas Henry Huxley, and father of Julian and Aldous Huxley (q.v.). He was educated at University College School, St. Andrews, and Balliol College, Oxford, and was assistant to the professor of Greek at St. Andrews (1883). After being reader to Smith, Elder & Co., he was editor of the *Cornhill Magazine*, which that company founded. He wrote *Life of Huxley* (1900); *Life of Sir Joseph Hooker* (1918); *Anniversaries and Other Poems* (1920); *Thomas Henry Huxley, a Character Sketch* (1920); *Charles Darwin* (1921); and *Progress and the Unfit* (1926). He translated Hausrath's *New Testament Times*, part II, and *Time of the Apostles* (1895); and edited *The Uttermost South* (1913); *Scott's Last Expedition* (1913); and *Jane Welsh Carlyle, Letters to Her Family* (1924).

**HUYSMANS, u's'mân', or his'mâns, CAMILLE** (1871- ). A Belgian political economist, professor in the New University of Brussels. He was a member of the town council of Brussels (1905-21) and in the following year became a member of the town council of Antwerp. He entered the Chamber of Representatives in 1910, was Minister of Sciences and the Arts from 1925-27, and in the latter year he was Minister of Education. His works include *L'affiliation des syndicats au Parti ouvrier* (1907); *Étude sur les Assurances sociales* (1912); *The Policy of the International* (1916); *Recherches politiques; De Menschwordingh; Mystère de Michel de Swaen* (1927).

**HYATT, ANNA VAUGHN (MRS. ARCHER M. HUNTINGTON)** (1876- ). An American sculptor (see Vol. XI). Her able craftsmanship in the sculpture of animal life, consistently evidenced in such later works as "Great Danes," "Colts in a Snowstorm," and "Reaching Jaguars," gave her a foremost position in this field in the United States. Her achievement in the statue of Joan of Arc, Riverside Drive, New York (1915), notable among such for its truth of detail, its simplicity and dignity, turned her interest somewhat toward equestrian subjects, with noteworthy results. Among her awards were the Rodin Gold Medal, Philadelphia, 1917, and the Saltus Gold Medal, 1920 and 1922. She became a member of the National Academy of Design in 1922, and a chevalier of the Legion of Honor (France), in 1922.

**HYDE, ARTHUR M.** (1877- ). An American Governor and Secretary of Agriculture. He was born at Princeton, Mo., and was graduated at the University of Michigan in 1899 (LL.B., State University of Iowa, 1900). He practiced law at Princeton, Mo., for fifteen years, serving as mayor for one term, and then moved to Trenton in the same State. He was elected Governor of Missouri as a Republican for the term 1921-25. On Mar. 4, 1929, he was appointed Secretary of Agriculture in President Hoover's cabinet.

**HYDE, CHARLES CHENEY** (1873- ). An American lawyer, born in Chicago, and educated at Yale University and the Harvard Law School. In 1898 he began practice in Chicago. He was solicitor for the Department of State at Washington, 1923-25, professor of law at the Northwestern University Law School, 1907-25, and Hamilton Fish professor of international law and diplomacy at Columbia after 1925. His several works on international law included *International Law, Chiefly as Interpreted and Applied by the United States* (1922); "Charles Evans Hughes as Secretary of State" (in vol. 10 of *American Secretaries of State*, 1928).

**HYDROAEROPANE.** See **AERONAUTICS**.

**HYDROCARBONS.** See **CHEMISTRY**.

**HYDROELECTRIC STATIONS.** See **ELECTRIC POWER STATIONS AND GENERATING APPARATUS: POWER PLANTS; POWER**.

**HYDROGEN.** See **CHEMISTRY**.

**HYDROGEN ATOM.** See **PHYSICS**.

**HYDROPHONE.** This name has been applied to any instrument for listening to sounds transmitted through water. Before the World War, such instruments were used for receiving signals from submerged bells. The hydrophone as usually fitted consisted of a small water-tight box of which one side was a metal diaphragm operating a microphone enclosed in the box. The box itself was suspended in a tank built against the ship's outer plating which formed one side of it. Early in the War attempts were made to use some form of hydrophone for detecting the presence of vessels (particularly submarines) within sound range of their internal machinery or propellers. For some time, no great success was attained but the effectiveness of listening devices was materially improved. Several fish-shaped hydrophones, 12 feet apart, towed astern and electrically connected for receiving the sound on board the vessel, gave fair results; but the Walzer hydrophone (the invention of a French naval officer), which attained its final form early in 1918, was said to have given greater satisfaction and was much used after March of that year. The receiving diaphragms were arranged at regular intervals over the surface of a hemispherical bulge built into the hull on each side toward the bows. The system acted as a sound lens, the sound focus occurring at a point where the sound paths by alternate routes were equal. From the results received, the direction of the source of sound could be calculated.

Hydrophones have been improved in recent years. The U. S. Navy uses the K-tube fish type (acoustic radius 30 miles) and the SC-tube and MB-tube types (acoustic radius 3 miles) which are built into the hull and insulated against noise. In using the fish type, the en-

gines and auxiliaries must be stopped; the built-in types, on the other hand, may be used without stopping the ship.

**HYLAN, JOHN F.** (1868- ). An American public official, born at Hunter, Greene Co., N. Y. He was educated in the public schools and engaged in various occupations in New York City. He graduated from the New York Law School in 1897 and in the same year was admitted to the bar. From 1906 to 1914, he was city magistrate and in 1914-15, judge of the county court. Mr. Hylan became mayor of New York City in 1918 and was reelected in 1922 for the term ending 1925.

**HYMANS, éman, PAUL** (1865- ). A Belgian diplomat, who was born in Brussels, and educated at the university there. He practiced at the Court of Appeals after 1885. In 1900 he became a Liberal member of Parliament and professor of law at Brussels University, in 1911 a member of the Royal Academy, and in 1914 a Minister of State. He was then Ambassador to London (1915-17), Minister for Foreign Affairs (1918-20), first Belgian plenipotentiary at the Peace Conference (1919), President of the first Assembly of the League of Nations (1920) and of the Council (1922), Minister for Foreign Affairs (1924-25), Minister of Justice (1926-27), and again Minister for Foreign Affairs (1927- ). He signed the Kellogg-Briand Peace Pact on behalf of his Government at Paris, Aug. 27, 1928. He was president of the Commission of Conciliation and Arbitration between Finland and Norway, and between Switzerland and Rumania. He wrote *Histoire parlementaire de la Belgique* (1880-1910), with Alfred Delcroix (3 vols.); *Bruxelles moderne*; and *Frère Orban* (2 vols., 1906-10). In 1927 he was made a Knight Grand Cross of St. Michael and St. George (British).

**HYTHE CONFERENCE.** See **REPARATIONS**.

**HYVERNAT (EUGÈNE XAVIER LOUIS) HENRY** (1858- ). A French Orientalist who studied at Lyons, Paris, and the Pontifical University of Rome. He was professor-interpreter of Oriental languages for propaganda and professor of Assyriology and Egyptology in Rome, 1885-89, and in 1889 went on a scientific mission to Armenia for the French government. He then came to America as professor of Oriental languages and archæology at the Catholic University. He is the author of *Les actes des martyres de l'Égypte* (1886); *Album des paléographie copte*, an introduction for the previous book (1888); *Du Caucase au golfe persique* (1892); *A Check List of Coptic Manuscripts in the Pierpont Morgan Library* (1919); and edited a 57-volume catalogue of the Coptic Manuscripts in the same library.

**I**BAÑEZ, BLASCO. See BLASCO IBAÑEZ, VICENTE.

**IBERT, JACQUES** (1890- ). A French composer, born in Paris. He studied at the Conservatoire in 1911-14, and in 1919 won the Prix de Rome with a lyric scene, *Le Poète et la Fée*. In his orchestral works he is a decided impressionist, while his chamber music shows strong sympathy with the neo-classicists. He has written two symphonic poems, *Noël en Picardie* and *La Balade de la Geôle de Reading*; an orchestral fantasy, *Persée et Andromède*; three sketches for orchestra, *Éscales*; a symphonic scherzo, *Féerique*; an orchestral suite, *Le Jardinier de Samos*; a concerto for 'cello and wind instruments; a quartet for wood-wind; a violin-sonata and a flute sonata; a ballet, *Les Rencontres* (Paris, 1925); an operatic farce, *Angélique* (Paris, 1927); and pieces for organ, piano, and harp.

**IBN SAUD, ib'n soud** (1882- ). King of the Hedjaz and leader of the Wahabi Mohammedans, who, as Sultan of Nejd, allied himself with Great Britain during the World War, and by 1918 was master of Central Arabia. When Hussein (q.v.), King of the Hedjaz, pronounced himself King of Arabia, Ibn Saud announced that he was unacceptable to Central Arabia, and declared war, soon conquering Mecca (1924). By the close of 1925, his success was assured, and in January, 1926, he was proclaimed King of the Hedjaz at Mecca. His government was recognized by the leading powers interested in Arabia, except Italy and Egypt. Deeply religious, one of his first efforts was to make the pilgrimage to Mecca as easy, safe, and cheap as possible; heretofore, pilgrims had been frequently robbed and attacked. He extended his power over several tribal chiefs, and on May 20, 1927, signed a treaty with Great Britain which recognized the independence of his Government. See ARABIA, under *History*, and *CALIPHATE*.

**IBSEN, ib'sen, SIGURD** (1859- ). A Norwegian statesman and author (see VOL. XI). His later works include *Robert Frank*, a play (1914), and *Tempel der Erinnerung* (1918), both translated into German and the former into English.

**ICE CREAM.** See DAIRYING.

**ICELAND.** An island in the North Atlantic, formerly a Danish possession but since 1918 a separate kingdom united to Denmark under a single crown. Its area is estimated at 39,709 square miles. The population rose from 85,183 in 1910 to 94,690 in 1920; in 1927 it was estimated to be 103,317. The population density of 2.5 per square mile is misleading because much of the country is uninhabitable; the practical density is about 11.1 per square mile in populated districts. Of the 1920 population, 54,245 lived in rural districts, and the rest in towns of over 300. Except for 706 persons, the population was entirely native born. Almost one-fifth of the total population lives in the modern capital, Reykjavik; this city in 1926 had 23,244

inhabitants. Besides Reykjavik, there are six other towns with a total population of 11,377. There is no immigration to, and very little emigration from Iceland.

Only one-quarter of one per cent of the land is under cultivation, mainly in hay, potatoes, and turnips. In 1926 the crops were hay, 3,458,000 cwt., potatoes, 66,000; turnips, 23,000. Live stock has shown an increase, with a 1926 figure of 52,800 horses, 27,900 cattle, 590,000 sheep, and 2800 goats. In 1925 the total value of the fisheries, the most important single industry, was 46,791,000 krónur, of which the cod catch alone was valued at 43,378,000 krónur. Three products belonging almost exclusively to Iceland are eider down, taken from the nests of the eider duck; Icelandic moss used by pharmacists; and the double-refracting crystals of Iceland spar used by opticians, the world's sole quarry of this material being situated near Eskifjörður in the southeastern part of Iceland and owned by the Icelandic government.

There is little manufacturing in Iceland, although the country has great potentialities because of its innumerable waterfalls. It has been estimated that from the Thjorsá River alone 1,000,000 horse power could be developed. However, the hot springs which abound in Iceland are beginning to be utilized, and in the last few years cures of rheumatism, gout, and kindred ills have been effected, although the methods and appliances used were of the most primitive kind. A new use for the hot springs has been found in the heating of buildings and of the soil of gardens, making it possible to raise vegetables throughout the year. The first heating installation of this kind on a large scale was made in 1920 in the Alafoss Cloth Mills near Reykjavik. Other possible manufacturing developments are electro-chemical plants for the production of nitrates and aluminium.

In 1926 exports were valued at 53,070,455 krónur and imports at 57,767,346 krónur, Great Britain and Denmark being, as in previous years, Iceland's leading trade factors. Financially, this was, in many respects, a poor year, because the summer was unusually wet and for that reason haymaking and the drying of fish were done under great difficulties. The 1928 budget estimate listed revenues at 10,451,600, and expenditures at 10,453,878, krónur. The largest charges were for communications, 3,225,930 krónur, and for instruction, 1,404,076 krónur. At the beginning of 1927, the public debt was 2,026,588 krónur, held for the most part in Denmark. There are no railways in Iceland, but there are 379 miles of carriage roads in excellent repair. In 1927, 81 vessels of 23,788 gross tonnage were flying the Icelandic flag.

**History.** By the Act of Union of Nov. 30, 1918, Iceland was granted home rule under the Danish Crown. Complete sovereignty was vested in the home government; foreign affairs alone were to be the charge of the Danish government until 1940. Iceland's perpetual neutrality was

established, and no armed force or fortifications were permitted her. Danish goods in Iceland and Icelandic goods in Denmark were to receive no more consideration than the products of other countries. By the new constitution promulgated in 1920, the executive rests in the King through a responsible ministry of three, the chief of whom is the president of the council. The ministry consists of the Prime Minister and Minister of Finance, Minister of Industries and Commerce, and Minister of Justice and Ecclesiastics. The legislative power resides in a bicameral House (Althing). The Lower Chamber of 28 members is elected; the Upper of 10 members is chosen, six by proportional representation at large and eight by the Lower House. All bills must be sent to Denmark for the King's approval. For administrative purposes, the country is divided into seven urban municipalities and 16 provinces or prefectures, which are, in turn, subdivided into 226 parishes with a certain amount of autonomy. The franchise is enjoyed by all Icelandic citizens (men and women) of good reputation (unless they are indebted for poor relief) who are over 25 years of age and have resided in the country during the previous five years. At the head of the local judicial system is the Supreme Court stationed at Reykjavik; this is the court of last appeal. The 100th anniversary of the establishment of the Althing was to be impressively celebrated in 1930.

Consult Knut Gjerset's *History of Iceland* (London and New York, 1924); W. A. Craigie's *Easy Readings in Old Iceland* (Edinburgh 1924); and Snaehjörn Jónsson's *Primer of Modern Icelandic* (Oxford, 1927).

**ICELANDIC LITERATURE.** See SCANDINAVIAN LITERATURE.

**IDAHO.** The twelfth State in size (83,888 square miles) and the forty-second in population; capital, Boise. The population increased from 325,594 in 1910 to 431,866 in 1920, a gain of 32.6 per cent; estimated population, 1928, 546,000. The white population rose from 319,221 (1910) to 425,668 (1920); Japanese, from 1363 to 1509; and native white, from 278,794 to 386,705. The number of foreign-born whites decreased from 40,427 to 38,963; of Indians, from 3488 to 3098; of Chinese, from 858 to 585. The urban population mounted from 68,898 to 119,087; the rural, from 255,696 to 312,829. The chief cities are Boise and Pocatello. The former grew from 17,358 to 21,393; and the latter from 9110 to 15,001.

**Agriculture.** The number of farms decreased 3.6 per cent, or from 42,106 in 1920 to 40,592 in 1925; while the acreage in farms fell from 8,375,873 to 8,116,147, and the improved land in farms from 4,511,680 to 3,714,336 acres. The total value of farm property showed a decrease, from \$716,137,910 in 1920 to \$451,884,713 in 1925; and the average value of farms from \$17,008, to \$11,132. In interpreting these values, the inflation of the currency in years immediately previous is to be taken into consideration. The index number of prices paid to producers of farm products in the United States was 104 in 1910 and 216 in 1920. The total percentage of land used for agricultural purposes in 1920 was 15.7; in 1925, 15.2. Farms reported as under mortgage numbered 20,060 in 1920; 30,195 in 1925; the change was due to the agricultural depression following the War. Of the farms in 1920, 34,647 were operated by owners, as compared with 30,105 in 1925; 758, by man-

agers, as compared with 511; and 6701, by tenants, as compared with 9886. The area under irrigation had increased from 1,430,848 acres in 1909 to 2,488,806 in 1919. The total number of cattle on farms in 1920 was 714,903; in 1925, 605,604; sheep numbered 2,356,270 in 1920; 1,745,769 in 1925; dairy cows numbered 138,768 in 1925. The estimated production of the chief farm crops of 1928 was: Corn, 2,438,000 bushels; wheat, 28,792,000; oats, 6,439,000; barley, 6,192,000; potatoes, 10,720,000; hay, 2,766,000 tons; and sugar beets, 285,000 tons. Comparative figures for 1913 are corn, 448,000 bushels; wheat, 14,094,000; oats, 15,112,000; barley, 7,560,000; potatoes, 5,780,000; and hay, 2,044,000 tons. Apple trees of bearing age numbered 1,005,668 in 1910 and 2,380,523 in 1920. In 1919, 3,645,640 bushels of apples were grown; in 1925, 5,000,000.

**Mining.** Idaho is one of the important mineral-producing States, especially for its metal mining. The products in the order of their value are lead, silver, zinc, and stone. In addition, there are produced copper, sand and gravel, and a considerable amount of gold. The condition of the mining industry in the decade 1914-24 is shown by the following comparison of production for several years: 1914, lead, 348,526,069 pounds, valued at \$13,592,517; silver, 12,479,516 ounces, \$8,901,172; gold, \$1,152,315; zinc, 42,012,435 pounds; 1917, lead, 393,559,521 pounds; silver, 12,029,338 fine ounces; gold, \$804,809; zinc, 79,854,136 pounds; 1920, lead, 249,609,976 pounds; silver, 7,326,794 fine ounces; gold, \$485,590; zinc, 27,932,326 pounds; 1928, lead, 200,645,905 pounds; silver, 8,998,330 ounces; gold, \$410,000; zinc, 62,526,648 pounds. A considerable amount of copper is produced; the output in 1928 was 2,072,105 pounds, compared with 2,538,396 pounds in 1920 and 6,445,187 pounds in 1914. The State ranked third in 1926, in respect of the amount of lead that was produced yearly. In addition to those minerals which have been mentioned, there have been produced antimony, bismuth, tungsten, cobalt, nickel, molybdenum, mica, asbestos, and coal. The total value of the mineral products in 1928 was \$31,752,821; in 1925, \$31,611,166; in 1921, \$16,502,273; \$32,440,783; in 1920; \$10,044,567 in 1919; \$36,872,270 in 1918; and \$24,913,223 in 1914.

**Manufactures.** Idaho is not an important manufacturing State, although its industries have increased considerably in number and in value of products. There are only two cities having a population of more than 10,000, Boise and Pocatello. These cities, with 8.4 per cent of the total population of the State, in 1919 reported 11.4 per cent of the total value of products. The number of establishments in the State in 1909 was 725; 1919, 922; 1925, 487; and 1927, 470; manufacturing wage earners numbered 13,917 in 1919; 15,782 in 1925; and 13,513 in 1927. The value of products rose from \$22,399,960 in 1909 to \$80,510,749 in 1919; and to \$96,641,797 in 1925; but fell to \$86,256,399 in 1927. This increase was partly due to the change in the industrial conditions brought about by the War. The increase in the number of persons engaged in manufactories and in the number of manufacturing establishments, however, indicates a large increase in the industrial activities of the State. The chief products in point of value are those from the manufacture of lumber and timber, which in 1909 were valued at \$10,689,000; 1919, \$30,643,000; 1925, \$40,304,157, and



in 1927, \$31,660,296. Flour-mill and gristmill products rank high, amounting to \$2,480,000 in 1909; \$3,396,000 in 1914; and \$13,501,000 in 1919; and \$6,001,897 in 1927. Dairy products totaled \$10,974,381 for 1925, and \$11,543,060 for 1927.

**Education.** Idaho has always been in the forefront of the States in educational progress. In 1912 a constitutional amendment was adopted which established the so-called Idaho System. This, in brief, provided for unity in the educational system; it established a State Board of Education which has charge of both the higher institutions and the public schools. The school code of 1913 provided that the State Board of Education should consist of five members appointed by the governor. This board was made also the board of regents of the universities; board of trustees for the normal schools, the Technical Institute, the School for the Deaf and Blind, and the Industrial Training School and had general charge of the entire public-school system. It has since been made also the State Board for Vocational Education. This system had admirable results from the year in which it was inaugurated, and in subsequent years still further advances were made. One of the most important of these was in 1917, when it was provided that thereafter candidates for the teaching profession must have completed courses in one of the high schools of the State, or have equivalent education, and must have had at least some professional training before being certified to teach. The Legislature of 1923 passed several important measures affecting education, among them one abolishing county institutes and several amending the tax laws relating to education. One of the most notable features of education was the growth of the Technical Institutes. Under the coöperative agreement with the United States, vocational education was carried on with great efficiency after 1917; and work on the rehabilitation of persons injured in industry was also begun. The enrollment in the public schools increased from 92,437 in 1914 to 117,656 in 1925-26. In the high schools, there were enrolled in the latter year 21,825 pupils. The expenditure for education in public day schools in 1925-26 was: current, \$8,376,301; outlays, \$646,206. The percentage of illiteracy in the State decreased from 2.2 in 1910 to 1.5 in 1920. In the native white population, it remained at 0.3 per cent; and in the foreign-born white population it decreased from 6.9 to 6.5 per cent. Illiteracy among the Negro population decreased from 6.4 per cent to 5.4.

**Finance.** State expenditures in the year ended Sept. 30, 1927, as reported by the U. S. Department of Commerce, were: for maintenance and operation of governmental departments, \$5,135,756 (of which \$629,704 was aid to local education); for interest on debt, \$333,231; for permanent improvements, \$3,163,260; total, \$8,632,247 (of which \$3,497,600 was for highways, \$846,705 being for maintenance and \$2,650,895 for construction). Revenues were \$8,160,495. Of this, property and special taxes furnished 28.9 per cent; departmental earnings and charges for officials' services, 5.6 per cent; sales of licenses and the tax on gasoline, 24.5 per cent. Property valuation was \$482,690,646; State taxation thereon, \$2,980,138. Net State funded debt on Sept. 30, 1927, was \$4,783,106, chiefly highway debt.

**Political and Other Events.** During recent years, political control in the State has fluctuated between the Republican and Democratic parties. For the greater part of the time, the former party was in control. In 1914 J. H. Brady, Democrat, was elected to the Senate, while Moses Alexander, also a Democrat, was elected governor. The Democrats were successful also in 1916, when they elected their State ticket by a plurality of 572 votes. The Republicans, however, elected two representatives to Congress. In the presidential election of 1916, Wilson received 70,021 votes; Hughes, 56,368. A new irrigation project was begun during that year to develop the territory known as the Bruneau country, about 400,000 acres in extent, and an electric railroad through this territory was begun. Several anti-alien bills were introduced in the Legislature of 1917, but at the request of the Secretary of State, followed by the protest of the Japanese Ambassador to Secretary Lansing, they were not passed. These bills would have prevented any Japanese from owning land. In the election of 1918, Senator Borah was reelected and John F. Nugent, Democrat, was elected to the Senate, to complete the term of J. H. Brady, deceased.

As a result of legislation in 1919, the State administration was reorganized. For 46 boards and commissions was substituted a commission or cabinet of nine officials representing the departments of agriculture, commerce and industry, finance, immigration, labor and statistics, law enforcement, public investment, public works, public welfare, and reclamation. In 1920 the Republicans elected D. W. Davis, governor and Frank R. Gooding, United States Senator. At this election, several constitutional amendments were adopted, one increasing the membership of the Supreme Court from three to five. In 1922 C. C. Moore, Republican, was elected governor. The question of the direct primary, the chief issue in this election, occupied the attention of the Legislature in 1923. The primary law, so far as it related to State officers, had been repealed by the previous Legislature, which had a Nonpartisan-Democratic majority, and the governor had been elected on a platform which endorsed the repeal. A new primary law was passed; but it was vetoed by the governor. The vote of the State in 1928 favored constitutional amendments to extend terms of elective State officers to four years and to give the State authority to limit the use of streams for water power. H. C. Baldrige, elected governor in 1926, was reelected in 1928. The vote for president in 1928 was: Hoover (Republican), 97,322; Smith (Democrat), 52,926.

**Legislation.** The Legislature in 1915 passed an anti-alien land ownership bill similar in its provisions to the California measures prohibiting the ownership of land in the State by alien persons, firms, or associations. A State-wide prohibition bill, effective in 1915, also was passed. A workmen's-compensation measure was vetoed by the governor. The same Legislature provided for absentee voting. In 1921 measures were passed authorizing the school districts to provide for the education of adult residents who were unable to read and write; creating a bureau of budget and taxation; providing for coöperative marketing; and establishing a teachers' retirement fund. The Legislature of 1923 created a small-claims court and provided that where a person had been three times convicted of a felony,

whether within or without the State, he might be sentenced to prison for not less than five years. A measure was passed extending the absent-voter privilege to persons who, because of physical disability, expect to be confined to their homes on election day. Another measure reserved the mineral rights of State lands to the State, and provided for their lease on a royalty basis. An act to establish primaries for county and legislative nominations was passed in 1927.

**IDAHO, UNIVERSITY OF.** A State institution for the higher education of men and women at Moscow, Idaho, founded in 1889. In the period from 1914 through the autumn of 1928, the enrollment at Moscow increased from 747 to 2109, with an additional registration of 309 in the summer session of the latter year. At the Southern Branch of the University at Pocatello, the 1928 autumn enrollment was 531, the summer-session enrollment, 111. The faculty increased from 80 to 153. In the period under review, the library was increased from 32,000 to 90,000 volumes; productive funds in 1928 amounted to \$2,016,400; and income to approximately \$1,250,000. The School of Mines and the School of Forestry were established in 1917; the School of Education in 1920, and the School of Business Administration, and the Graduate School in 1925. Lindley Hall, a men's dormitory was erected in 1920-22, Mary E. Forney Hall, a dormitory for women, was opened in 1923; accommodations of the College of Engineering were augmented in the same year by the purchase of the plant and equipment of a Moscow industrial concern, including several shop buildings; the Science Hall was completed in 1925 at a cost of \$400,000; a \$300,000 armory-gymnasium, in memory of Idaho's service men and women in the World War and other wars, was added in 1927-28 through the joint efforts of the University alumni and the Idaho department of the American Legion; a science hall was built on the campus of the Southern University, and other building improvements effected. The Southern Branch, which was established by act of the legislature and opened its first academic year in 1927, had formerly been the Idaho Technical Institute, which in turn had replaced the Academy of Idaho in 1915. A forestry experiment station was established at the University at Moscow in 1928. President, Frederick James Kelly, Ph.D.

**IDDINGS, EDWARD JOHN** (1879- ). An American educator and animal husbandman, born at Peru, Ind., and educated at Butler College in Indianapolis and Colorado Agricultural College. He was a member of the faculty of the latter until 1910, when he joined the faculty of the University of Idaho. In 1910-11 he was principal of the School of Practical Agriculture and assistant in animal husbandry, and in 1911 he became professor of animal husbandry. Since 1918 he has been dean of agriculture and director of the Agricultural Experiment Station and since 1924 director of extension service. He is the author of numerous bulletins and articles relating to live stock.

**IDO.** See INTERNATIONAL LANGUAGE.

**ILLEGITIMACY.** See CHILD WELFARE.

**ILLINOIS.** The twenty-third State in size (56,665 square miles) and the third in population; capital, Springfield. The population increased from 5,638,591 in 1910 to 6,485,280 in 1920, a gain of 15 per cent; estimated population 1928, 7,390,000. The white population rose from 5,526,962 (1910) to 6,229,333 (1920); Negro,

from 109,049 to 182,274; native white, from 4,324,402 to 5,092,382; foreign-born, from 1,202,560 to 1,206,951. The urban population mounted from 3,476,926 to 4,403,153; the rural decreased from 2,161,662 to 2,082,127. The growth of the principal cities was as follows: Chicago (q.v.), 2,185,203 to 2,701,705; Peoria, 66,950 to 76,121; East St. Louis, 58,547 to 66,767; Rockford, 45,401 to 65,651.

**Agriculture.** Illinois is one of the most important of the agricultural States and conditions after the World War, therefore, were affected by the general agricultural situation in regard to wheat and other products. (See AGRICULTURE, CORN, and WHEAT.) The number of farms decreased 4.8 per cent, or from 237,181 in 1920 to 225,601 in 1925; the acreage in farms decreased from 31,974,775 to 30,730,497. The improved land embraced 27,294,533 acres in 1920; crop land totaled 21,314,837 acres in 1925. The total value of farm property rose from \$3,905,321 in 1910 to \$6,666,767,235 in 1920, but fell to \$4,627,964,933 in 1925. The average value per farm was (1910) \$15,605, (1920) \$28,108, and (1925) \$20,514. In interpreting these values, the inflation of the currency incident to the War is to be taken into consideration. The percentage of land in farms decreased from 90.7 in 1910 to 89.1 in 1920 and 85.7 in 1925. Of the total number of farms in 1925, 129,074 were operated by owners; 1877, by managers; and 94,650, by tenants; while the comparative figures for 1910 were 145,107; 2386; and 104,379. The white farmers in 1920 numbered 236,288, compared with 250,447 in 1910; foreign-born farmers, 22,111 and 33,394; colored farmers, 893 and 1425. In 1920, 51,030 farms were reported as under mortgage; in 1925, 45,814. The number of dairy cows in 1920 was 1,148,173; in 1925, 833,097; "beef" cows numbered 501,034 in 1920, 403,897 in 1925; mules, 168,274 in 1920, 167,760 in 1925; hogs, 4,639,182 in 1920, 4,249,101 in 1925; and sheep, 637,685 in 1920, 566,079 in 1925. The estimated production of the principal farm crops in 1928 was: Corn, 367,488,000 bushels; wheat, 24,200,000; oats, 174,338,000; barley, 20,060,000; potatoes, 7,700,000; and hay, 4,091,000 tons. Comparative figures for 1913 are corn, 282,150,000 bushels; wheat, 41,888,000; oats, 104,125,000; barley, 1,404,000; potatoes, 5,750,000; and hay, 2,450,000 tons.

**Mining.** Illinois, although it produces practically no metals, is one of the most important of the mineral-producing States. It ranked seventh in the value of its mineral products in 1926. These, in the order of their value, are coal, clay products, petroleum, and cement. The movement of mineral production in the period starting with 1914 is indicated by the figures given below. The production of coal in 1914 was 57,589,197 short tons, valued at \$64,693,529; 1917, 86,199,387 and \$162,281,822; 1918, 89,291,105, and \$206,860,291; 1919, 60,802,608 and \$140,075,909; 1920, 88,724,893 and \$273,509,000; 1921, 69,602,763 and \$190,986,000; 1922, 58,407,736 and \$168,925,000; 1926, 69,366,923 and \$148,604,000; 1927, 46,848,224 and \$101,356,000. The declines of 1921-22 and of 1927 were largely the result of protracted strikes in the Middle West coal fields. Production of petroleum decreased with comparative steadiness after 1914. In 1914 there were produced 21,919,749 barrels, valued at \$25,426,179; in 1916, 17,714,235, at \$29,237,168; 1918, 13,365,974, at \$31,230,000; 1922, 9,383,000, at \$19,291,000; 1927, 7,024,000

barrels at \$11,800,000 (estimated). The value of clay products on the whole increased; in 1914 they amounted to \$13,318,953; 1918, \$12,459,777; 1920, \$26,138,419, and 1926, \$37,030,004. The production of cement, exclusive of natural cement, increased gradually, ranging from 5,401,605 barrels in 1914 to 7,017,047 in 1927. It was 5,538,558 in 1920, and 5,587,825 in 1921. The value of the product, however, greatly increased, owing chiefly to the decreased purchasing power of money and the consequent higher prices. The value of shipments in 1914 was \$4,848,522, while in 1921, for practically the same production, the value was \$9,992,982. The 1927 cement shipments totaled \$11,312,783. The State produces large quantities of coke, sand and gravel, and stone, and smaller quantities of asphalt, mineral waters, and natural gas. The total value of the mineral products in 1927 was \$180,288,060, compared with \$237,241,600 in 1926; \$373,926,540 in 1920; \$213,701,212 in 1919; \$271,244,365 in 1918, and \$117,166,370 in 1914.

**Manufactures.** Illinois is one of the most important manufacturing States. It has 44 cities with populations of more than 10,000, which form 58.7 per cent of the total population. Of the total value of the manufactured products in 1919, these cities reported 84.3 per cent. In 1909 there were in the State 18,026 manufacturing establishments; in 1919, 18,593; in 1925, 14,104, and in 1927, 14,711; while wage earners engaged in manufactories numbered 506,943 in 1914, 653,114 in 1919, 622,127 in 1925, and 623,468 in 1927. The capital invested amounted to \$1,548,170,701 in 1909 and \$3,366,452,696 in 1919. The value of the products in 1909 was \$1,919,276,594; in 1919, \$5,425,244,694; in 1925, \$5,317,635,887; and in 1927, \$5,386,003,235; the increase up to 1919 was due largely to changes in industrial conditions brought about by the War and cannot be properly used to measure the normal growth of manufactures, but the increase shown in the number of wage earners clearly indicates a decided growth in the manufacturing activities of the State. The most important industry in point of value of products is that connected with slaughtering and meat packing, the value of its product in 1909 was \$389,595,000; in 1919, \$1,294,167,000; in 1925, \$680,591,940; in 1927, \$663,054.31. Foundry and machine-shop products amounted in 1909 to \$138,579,000; 1914, \$141,329,000, and 1919, \$421,969,000. The manufacture of men's clothing in 1909 amounted to \$89,473,000; in 1914, \$89,144,000; in 1919, \$201,816,000; and in 1927 to \$130,482,815. Industries related to the manufacture of iron and steel products attained a yearly output of \$86,608,000 in 1909; \$173,345,000 in 1919; \$295,342,113 in 1925. In 1927 the output of blast furnaces was valued at \$70,943,000 and of steel works and rolling mills at \$208,563,956.

The chief manufacturing cities are Chicago, Peoria, East St. Louis, and Rockford. In Chicago in 1909, there were 9656 manufacturing establishments with a product valued at \$1,281,171,000; in 1919, 10,537, with \$3,657,242,000; in 1925, 9112, with \$3,439,163,000; in 1927, 9955 manufacturing establishments reported products valued at \$3,478,753,623. In 1909 Rockford had 205 manufacturing establishments with products valued at \$22,226,000; in 1914, 265, with \$26,371,000; and in 1919, 312, with \$74,919,000. In Peoria in 1909, there were 283 establishments, with products valued at \$63,061,000; in 1914, 283, with \$64,689,000; and in 1919, 253, with

\$57,075,000. Similar figures for East St. Louis were: in 1909, 138 establishments with products valued at \$18,104,000; in 1919, 157, with \$77,293,000.

**Education.** Illinois has always been one of the most aggressive States in the development of educational systems, and its progress has continued during recent years. Prior to 1924 an active campaign was carried on by the State Teachers' Association to secure an annual distribution of \$20,000,000 from the State and the various counties for educational purposes. This movement had a great effect in turning the attention of taxpayers and lawmakers to the principles underlying the educational State distributive fund. The Legislatures from time to time enacted several important laws, including measures providing for humane education; physical education; the teaching of all elementary subjects in the English language only; and, in 1921, a measure for making the teaching of representative government in the public schools and other educational institutions in the State compulsory. In 1923 a State continuation-school law became effective, requiring that continuation classes be organized in districts having as many as 20 boys and girls between the ages of 14 and 18 out of school, unless such individuals have completed a four-year high-school course. Vocational education was carried on successfully during this period and included, under vocational home economics, courses in home-making, nursing, and dietetics. The Legislature of 1921 created a State Educational Commission to investigate the entire educational system of the State with a view to the standardizing, unification, and correlation of its various efforts, policies, and agencies, and for other purposes. A teachers'-pension law was enacted by the Legislature of 1915. In 1923, 325 school districts had been consolidated, in the elementary schools of which 7332 were enrolled, and in the high schools, 1337. Vocational courses, including courses in agriculture, industrial education, and home economics, were being conducted in 199 cities in 1923; and \$435,327 was disbursed from Federal and State funds for their support. The enrollment in the public schools increased from 1,007,894 in 1911 to 1,331,329 in 1925-26; in the elementary schools, from 941,540 to 1,095,618; in the high schools, from 66,355 to 235,711. The total expenditure for education in the public day schools of the State in 1925-26 was: for current expenses, \$106,382,345; outlays, \$31,968,339. The percentage of illiteracy in the State decreased from 4.7 per cent in 1910 to 4.3 per cent in 1920; among the native white population from 2.2 to 1.4 per cent; among the Negro population, from 12.4 to 7.9 per cent. Among the foreign-born white population, it increased from 10.3 to 11.7 per cent.

**Finance.** State expenditures in the year ending June 30, 1927, as reported by the U. S. Department of Commerce, were: for maintenance and operation of departments, \$44,037,302 (of which \$8,485,637 was for local education); for conducting public-service enterprises, \$39,022; for interest on debt, \$5,944,465; for permanent improvements, \$20,768,850; total, \$70,789,639 (of which \$19,275,200 was for highways, \$2,556,918 being for maintenance and \$16,718,282 for construction). Revenues were \$79,483,126; of this, property and special taxes formed 51.2 per cent; departmental earnings, 3.8 per cent; receipts from licenses, 38.4 per cent. Assessed property

valuation was \$4,195,581,136; State taxation thereon, \$27,271,277. Net State debt on June 30, 1927, was \$140,158,985.

**Political and Other Events.** In the elections in 1914, women participated under a law of 1913, voting for all but constitutional officers. Lawrence Y. Sherman was reelected to the Senate. The Republicans also elected 16 members of the House of Representatives, including Joseph G. Cannon. In 1915 Carter H. Harrison, five times elected mayor of Chicago, was defeated for the Democratic nomination by Robert M. Schweitzer, who in turn was defeated by William Hale Thompson, Republican. Frank O. Lowden in 1916 was nominated by the Republicans for governor and was elected. In the election for President, Charles E. Hughes received 1,152,316 votes; President Wilson, 950,081. In 1916 a serious race riot in East St. Louis occurred on June 8 between Negroes and white men; it lasted for three days. The killed numbered 29 persons, of whom 25 were Negroes; over 300 houses were burned. The riot began when a Negro attacked an automobile which contained several policemen. A grand jury declared in its findings that the police had been grossly negligent and could have prevented the riot. In the elections of 1918, Medill McCormick was elected United States Senator, defeating Senator James Hamilton Lewis, Democrat. In 1920 Len Small, Republican, was elected governor, and William B. McKinley, also Republican, United States Senator. In the voting for President, Warren G. Harding received 1,420,480 votes; J. M. Cox, 543,395. In 1920 a constitutional convention was called. The new constitution proposed by the convention was rejected by popular vote, Dec. 12, 1922. On July 20, 1921, Governor Small and Lieut. Gov. Fred E. Sterling were indicted for conspiracy to defraud the State and for embezzlement of public money during their respective terms as State Treasurer. These indictments were based on charges that the accused officials had retained for their own use large sums paid them as interest on State funds. Governor Small was acquitted on June 24, 1922, but was later held accountable for the retained interest, in civil actions. During 1922, the State suffered from coal-mining strikes which were accompanied in several cases by riots. In Herrin, a mob of striking coal miners killed 50 nonunion miners, after they had surrendered their arms, under the most brutal conditions. In 1923 William E. Dever, Democrat, was elected Mayor of Chicago, succeeding William Hale Thompson. Fred Lundin, the political boss of the city during the Thompson administration, was tried for fraud in 1923 and acquitted. Len Small was renominated for governor by the Republicans in 1924 and elected. The vote for President was: Coolidge, 1,453,321, Davis, 576,975; LaFollette, 432,027. Serious trouble arose early in 1924 in Williamson County, the scene of the Herrin murders of 1922, over attempts to destroy illicit stills and to suppress related forms of lawlessness. Conflicts took place between the police, alleged members of the Ku Klux Klan, and other citizens.

A number of States brought action in 1926 to restrain the Chicago Sanitary District from drawing water in excess of its permitted allowance through the Chicago Drainage Canal. The U. S. Supreme Court ruled in 1928 that the withdrawal of water was excessive, but allowed time for the construction of sewage disposal works.

Frank L. Smith, Republican candidate, was elected Senator in 1926, but owing to alleged excessive expenditures on behalf of his campaign, the U. S. Senate refused to admit him in 1927. William Hale Thompson was elected Mayor of Chicago Apr. 5, 1927, by the Republican vote, and his administration proceeded to oust the city school superintendent, William McAndrew, a step that was widely condemned. In April, 1928, a Republican element opposed to Mayor Thompson and Governor Small gained the nominations and in November were elected: U. S. Senator, Otis F. Glenn; Governor, Louis L. Emmerson, and other State officials, all Republican. The Chicago Crime Commission promoted action against alleged corrupt alliances of officials and commercialized criminality in that city. The vote of the State for President in 1928 was: Hoover (Republican), 1,768,141; Smith (Democratic), 1,313,817.

**Legislation.** In 1917 the Legislature adopted a State civil administrative code by which branches of the government were readjusted. The Legislature also enacted a "blue sky" law. The Legislature in 1919 ratified the Federal suffrage amendment; passed a "search and seizure" bill for the enforcement of the Prohibition law; entered on a road-building project involving the expenditure of more than \$87,000,000, abolished the State Board of Equalization, substituting the State Tax Commission of three members to be appointed by the Governor. In 1921 the Legislature passed measures providing for equality in voting between men and women. An act also was passed providing for compensation to veterans of the War, to be paid out of a bond issue of \$55,000,000. The act was duly approved by popular vote. The Legislature in 1923 passed a bill to facilitate cooperative marketing of agricultural products and made provision for creating associations for this purpose. Capital punishment by the electric chair was adopted in 1927.

**ILLINOIS, UNIVERSITY OF.** A State institution for the higher education of men and women at Urbana-Champaign, Ill., founded in 1867. The enrollment increased from 5500 in 1914 to 12,150 in the autumn of 1928, with an additional enrollment of 2270 in the summer session of the latter year. The faculty increased from 704 in 1914, to 743 above the rank of assistant, 418 of the rank of assistant or lower, and 26 administrative officers; the library was increased from 310,000 volumes to 762,187 volumes and 160,560 pamphlets in 1928; and the income of the institution from \$2,775,000 to \$7,730,842, of which \$5,722,113 was from the State. Among additions to the physical plant during the period under review were a genetics building and the vivarium erected in 1916, a women's residence hall in 1917, an educational building in 1917, the Smith Memorial Music Building in 1919, and the medical research laboratory and library at Chicago. The horticultural and agricultural buildings and stadium were begun in 1922; buildings under construction in 1924 included a new commerce building, a new library building, and a gymnasium; a hospital was completed in 1925 and construction was begun on an architectural building, and additions to the library, gymnasium, and armory; in 1927 additions were made to Lincoln Hall and the Library; and in 1928 a building for architecture and kindred arts was constructed, and a laboratory of applied mechanics and an addition to Lincoln Hall were under construction. David Kinley, Ph.D., LL.D., suc-

ceeded Edmund J. James, Ph.D., LL.D., in 1919, as president.

**ILLINOIS CANAL.** See CANALS.

**ILLINOIS COLLEGE.** The oldest collegiate institution in Illinois, founded in 1829 at Jacksonville, Ill. The student enrollment increased from 131 in 1914 to 519 in 1928-29; the faculty numbered 24 members in the autumn of 1928; and the library contained 22,000 volumes. The invested endowment in May, 1928, amounted to \$1,174,012, and the income for 1927-28 to \$131,380, exclusive of boarding departments. The science building was partly burned in 1920 and was reconstructed at a cost of \$50,000; departments of psychology, economics, education, and business administration were established between 1914 and 1924; the Department of Music was merged with a similar department of Illinois Woman's College of the city of Jacksonville in 1927-28; and a new library, to cost about \$200,000, was under construction in 1928, to be dedicated at the celebration of the centenary of the founding of the college in 1929. President, Charles Henry Rammelkamp, Ph.B. Ph.D.

**ILLINOIS WOMAN'S COLLEGE.** An institution for women founded in 1846 at Jacksonville, Ill. The number of students registered in the regular college courses increased from 185 in 1914 to 341 in the autumn of 1928, special students numbered 11, and others in music and junior courses not already counted brought the total enrollment up to 694. The faculty in the autumn of 1928 numbered 42. The number of volumes in the library increased from 3000 to 15,506 volumes and the productive funds exceeded \$600,000. New courses were added during the year 1928 in nurses' training, kindergarten training and German, a science hall was completed at a cost of \$251,000, and an athletic field was under construction. President, Clarence Paul McClelland, S.T.D., D.D.

**ILLITERACY.** See EDUCATION IN THE UNITED STATES.

**ILLUMINATION.** See ELECTRIC LIGHTING.

**IMELMANN, RUDOLF H. R. (1879- )**. A German writer and specialist on the English language and literature, born in Berlin, and educated at the universities of Jena, Bonn, Berlin, and Freiburg. He became professor of English literature at Rostock. His principal works

are *Das Altenglische Menologium* (1902); *Layamon* (1906); *Der Deutsche Krieg und die Englische Literatur* (1915); *Forschungen zur Altenglischen Poesie* (1920); a history of English literature; and translations of Byron and Browning.

**IMMIGRATION.** The widespread agitation for the restriction and control of immigration, which was increasingly successful from 1914 to 1929, seemed to indicate the abandonment, at least temporarily, of the time-honored theory that the United States should be a refuge for those persecuted and in distress; the stand was definitely taken in this period that immigration should be regulated primarily in accordance with the need and best interests of the country itself. The growth in this sentiment for restriction was based not so much, perhaps, on actual increase in the number of alien immigrants (although fear of flooding after the War had much to do with bringing the issue to a head) as on the changed character of the immigration. It was the rapidly increasing proportion from southern and eastern Europe, a class regarded as less easy to assimilate, which gave rise to fears in some quarters that the problem of assimilation, already serious, would grow quickly out of hand unless restrictive measures were taken. Some groups saw in a flood of this divergent type a danger to the fundamental character of the population and a menace to cherished institutions. Labor fought against the overcrowding of the market with workmen whose standards of living and inaccessibility for organization had a tendency to lower wages and living standards. The steady growth of this sentiment against so-called unassimilable elements in immigration, and the success of the attempt to check their influx, made the period important in the development of a definite immigration policy. See ANTHROPOLOGY; ETHNOGRAPHY; RACE PROBLEMS.

The tendency in immigration before the War was generally to increase numerically. For 1905-14 the average was 1,012,194 aliens entering in one year. With the War, there came a sharp decline in numbers and the annual average for 1915-18 dropped to 257,887; but in 1921, the number of alien immigrants admitted was again over 800,000. In 1928-29 279,678 immigrants

NET INCREASE OF POPULATION BY ARRIVAL AND DEPARTURE OF ALIENS, FISCAL YEARS ENDING JUNE 30, 1908 TO 1928

	Immigrant	Admitted Nonimmigrant	Total	Emigrant	Departed Nonimmigrant	Total	Increase
1908	782,870	141,825	924,695	395,078	319,755	714,828	209,867
1909	751,786	192,449	944,235	225,802	174,590	400,392	543,843
1910	1,041,570	156,467	1,198,037	202,436	177,932	380,418	817,619
1911	878,587	151,713	1,030,300	295,666	222,549	518,215	512,085
1912	838,172	178,983	1,017,155	333,262	282,030	615,292	401,863
1913	1,197,892	229,835	1,427,227	308,190	308,734	611,924	815,303
1914	1,218,480	184,601	1,403,081	308,338	330,467	633,805	769,276
1915	326,700	107,544	434,244	204,074	180,100	384,174	50,070
1916	298,826	67,922	366,748	129,765	111,042	240,807	125,941
1917	295,403	67,474	362,877	66,277	80,102	146,379	216,498
1918	110,618	101,235	211,873	94,585	98,683	193,268	18,585
1919	141,132	95,889	237,021	123,522	92,709	216,231	20,790
1920	480,001	191,575	621,576	288,315	189,747	428,062	193,514
Total 10 years, 1911-1920	5,735,811	1,376,271	7,112,082	2,146,994	1,841,163	3,988,157	3,123,925
1921	805,228	172,935	978,163	247,718	178,313	426,031	552,132
1922	309,556	122,949	432,505	198,712	146,672	345,884	87,121
1923	522,919	150,487	673,406	81,450	119,136	200,586	472,820
1924	706,896	172,406	879,302	76,789	139,956	216,745	662,557
1925	294,314	164,121	458,435	92,728	132,762	225,490	232,445
1926	304,488	191,618	496,106	76,992	150,763	227,755	268,351
1927	335,175	202,826	538,001	78,866	180,142	258,508	284,493
1928	307,255	198,376	505,631	77,457	196,899	274,356	226,275
1929	279,678	199,649	479,327	69,208	183,295	252,498	226,829



arrived, the smallest number since 1919. The table giving the net increase of population by arrival and departure of aliens, 1908-29, shows an equally sharp curve.

The number of alien immigrants admitted in the decade ending in 1910 was 8,795,386, or 116 per 1000 of the initial population. For the decade ending in 1920, the number was 5,735,811, or 62 per 1000. While in 1910, out of a total population of 91,972,266, the foreign-born numbered 13,345,545, or 14.5 per cent, in 1920, out of 105,710,620, they numbered 13,712,754, or 13 per cent, practically the same proportion as in 1860 (13.2). (See POPULATION.) The lessening of the proportion of foreign-born during the decade was no doubt due in large part not only to the falling off in immigration during the War but also to the unusually high rate of emigration among aliens. In 1916, 129,765 aliens left the United States; in 1917-21, the average annual emigration amounted to 164,083; in the two years following the War, the outward movement to Europe, largely to the southern and eastern sections, practically offset the immigration from that continent. In the latter part of 1920, however, the tide began to turn, and by 1921 the annual increase in population because of immigration was well on its way to the peak figure.

It was the marked change in the character of the immigration, however, which seemed the main cause of uneasiness. In 1882, 85 per cent of the European immigrants came from the northern and western parts; by 1907, 85 per cent was coming from the eastern and southern parts. For a considerable number of years before 1914, the normal annual number of alien immigrants from northern and western Europe had been 185,000, as compared with 750,000 from the eastern and southern Europe. Although immigration from Austria, Hungary, Germany, and Russia fell off to practically nothing in the years immediately after 1917, and although about this time there was a striking increase in immigration from Mexico and Canada, in 1920-21, 66.7 per cent of the total number of immigrants admitted were of races and peoples peculiar to southern and eastern Europe and Asiatic Turkey. With the turn of the tide in the latter part of 1920, and the prospect of increasing numbers from southern and eastern Europe, the feeling against this type of immigrant grew stronger. Because of racial differences, they were not easy to assimilate; they showed a greater tendency than the northwestern Europeans to crowd in urban centres and thus oversupply the labor market; they brought with them more often the danger of radicalism.

The growing movement to control immigration, which up to 1910 had developed only so far as to exclude the morally and physically undesirable and the contract laborer, to bar Chinese, and practically to bar Japanese by virtue of the "Gentleman's Agreement," at first contented itself with efforts to set a literacy test. The struggle for this restrictive measure dated back to 1897, when Cleveland vetoed the proposal; it had become prominent again in 1906. Taft vetoed such a bill in 1912, Wilson in 1915. In 1917 Wilson vetoed the proposal for the second time, on the ground that it punished the immigrant for what was no fault of his, and because, in allowing for the exemption of refugees from religious persecution, it might lead to embarrassing expressions of opin-

ion on governmental policies abroad; but the measure was passed over his veto. This bill required that all aliens over 16, who were physically able, in order to be admitted must be able to read English or some other language or dialect, although it allowed for the bringing in of father or grandfather over 55, wife, mother, grandmother, unmarried or widowed daughter, and for the entry of those persecuted for religious reasons, even if illiterate. It also contained a clause restricting Oriental immigration and increased the poll tax on entering aliens to \$8. The effect of this bill is shown in the fact that while between 1908 and 1917, 1,617,000 illiterates over 14 had been admitted, and while in 1913 illiterates made up 26.6 per cent of the entering alien immigrants, in 1920 this class numbered only 15,094, or 4.4 per cent of the total number admitted. There is some significance also in the increased proportion of rejected applicants: 2.3 in 1914; 5.3 in 1915; 4.9 in 1916; 4.2 in 1917; 3.3 in 1918; 3.6 in 1919; this, although due in some measure to the more rigid inspection possible when immigration had fallen low during the War, was also attributable to the new requirement.

In 1920, with a marked increase in immigration toward the end of the year, the fear of a flood from the war-stricken countries of Europe was intensified, and the demand for still further restriction became insistent. An emergency measure presented to Congress in 1920 provided for the practical shutting off of immigration for 14 months. The bill, finally passed in 1921, was based on the percentum-limit plan; it provided that the number of aliens of any nationality admitted in any fiscal year was not to exceed 3 per cent of the number of foreign-born residents of that nationality in the United States in 1910, nationality to be determined by country of birth. It applied only to Europe and the Near East, Africa, Australia, New Zealand, Asiatic Russia, and islands of the Atlantic and Pacific not adjacent to the mainland of the Western Hemisphere.

This plan was designed to decrease the number of immigrants from eastern and southern Europe and to increase proportionately the numbers from western and northern European countries; whereas in the years before 1914, the normal number of immigrants from northern and western Europe had been about 185,000 and from southern and eastern Europe about 750,000, under the new quota arrangements these figures were limited to 200,000 and 155,000, respectively. During 1913-14, for example, from southern and eastern Europe there came 75.6 per cent of the country's immigrants and from northern and western Europe, there came 20.8 per cent; in 1922-23, under the Quota Law, the proportion for the former was 31.1 per cent, as against 52.5 per cent for the latter. In May, 1922, the life of the 1921 Quota Law was extended to June, 30, 1924, and at the same time the requirement of one year's residence in an adjacent country, to escape the quota restriction, was raised to five years.

On May 26, 1924, a new Quota Law was signed by President Coolidge for the purpose of further restricting eastern and southern European immigration. This law limited immigrants to 2 per cent of the nationals of any country who had been in residence in the United States in 1890. By this measure, the aggregate immigration from outside the Western Hemisphere was limited to

161,000 persons annually for three years and to 150,000 thereafter. Under the new quotas, 75 per cent of the immigrants were to be drawn from the countries of northern and western Europe. Wives, minor children (of 18 years and under) and elderly parents were privileged to enter as a nonquota class. All quota and non-quota immigrants were to be in possession of immigration visas issued by American consuls at the port of embarkation. The act further provided that after July 1, 1927, quotas were to be based on "national origins," i.e., the annual quota of any nationality was to be a number which was to bear the same ratio to 150,000 as the number of inhabitants in continental United States in 1920 having that national origin bore to the number of inhabitants in continental United States in 1920.

The National Origins Commission, made up of the Secretaries of Commerce, Labor, and State was to prepare the table of quotas. The Commission found the task attended by the greatest difficulties and Congress was twice called upon to postpone the promulgation of the new regulations (in 1927 and 1928).

On Feb. 27, 1929, President Coolidge sent to Congress a table of quotas based on these national origins as worked out by the experts of the commission with the following noncommittal statement of the commission's members: "We wish it to be understood that we neither collectively nor individually are expressing any opinions on the merits or demerits of this system of arriving at quotas." Mr. Hoover, when a member of the commission, had many times expressed his disapproval of the national-origins plan and there was considerable speculation whether he would issue a presidential proclamation inaugurating the new quotas or call upon Congress to abandon the method.

Late in March, 1929, President Hoover issued a presidential proclamation putting into operation the national-origins quotas as of July 1. Though he had consistently opposed the method for establishing quotas, he had learned from the Attorney General that the law gave him no other recourse. His proclamation said: "The Attorney General has advised me that in failure of Congress to suspend action, it is now mandatory upon me under the Immigration Act to issue the proclamation establishing 'national origins' as the basis of the immigration quotas. The proclamation must be issued prior to April 1 and will be issued at once. It will go into effect on July 1, unless action is taken by Congress in the meantime."

In the table that follows, the national-origins quotas submitted by President Coolidge are shown in column A; those submitted on Feb. 27, 1928, are shown in column B; the quotas based on the law of 1924 are shown in column C (1890 census); and those based on the law of 1921 (1910 census) are shown in column D.

With restrictive immigration in operation for seven and one-half years, it was generally agreed that the system had been of benefit to the country. There were still certain aspects of the matter that nevertheless were cause for criticism. The law was considered unduly harsh upon the relatives and children of aliens in the country in that it did not make it easy for families to be united, with the result that each year saw more emigrations of the nationals of certain southern and eastern European countries than there were immigrations; the favoring of the northern and

## NATIONAL-ORIGINS QUOTAS

Country	A.	B.	C.	D.
Armenia	100	100	124	230
Australia	100	100	121	279
Austria	1,413	1,639	785	7,342
Belgium	1,304	1,323	512	1,563
Czechoslovakia	2,874	2,726	3,073	14,357
Danzig	100	137	228	301
Denmark	1,181	1,234	2,789	5,619
Estonia	116	100	124	1,348
Finland	569	568	471	3,921
France	3,086	3,308	3,954	5,729
Germany	25,957	24,903	51,227	67,607
Gt. Brit. & Nor. Irl.	65,721	65,894	34,007	77,842 *
Greece	307	312	100	3,063
Hungary	869	1,181	473	5,747
Irish Free State	17,853	17,427	28,567	...
Italy	5,802	5,989	3,845	42,057
Jugoslavia	845	739	671	6,426
Latvia	286	242	142	1,540
Lithuania	366	492	344	2,629
The Netherlands	3,153	3,083	1,648	3,607
Norway	2,377	2,403	6,453	12,202
Poland	6,524	6,090	5,982	30,977
Portugal	440	457	503	2,465
Rumania	295	311	603	7,419
Russia (European and Asiatic)	2,784	3,540	2,248	24,405
Spain	252	305	131	912
Sweden	33,314	3,399	9,561	20,042
Switzerland	1,707	1,614	2,081	3,752
Syria and the Lebanon	123	125	100	882
Turkey	226	233	100	2,654
Totals	153,714	153,685	164,647	357,803

The totals for columns A and C include 87 minimum quotas of 100 each for 87 minor geographical subdivisions; column B's total includes 16, while column D's includes 32.

\* Includes the Irish Free State.

western Europe as against other sections was interfering with the flow of unskilled labor into the country with the result that Mexicans were encouraged by industry to migrate to the United States; inadequate administrative machinery was making it possible for some individuals to carry on a lucrative trade in the bootlegging of immigrants, etc. All these matters were receiving public attention toward the close of the period being surveyed. In 1927-28, for example, the immigrants from the Northern Hemisphere numbered almost half those admitted. Mexicans and Canadians alone made up 43 per cent, the Mexicans totaling 59,016 and the Canadians, 73,154; as against 45,778 immigrants from Germany; 24,544 from the Irish Free State; 19,958 from Great Britain; 17,728 from Italy; and 16,184 from the Scandinavian countries.

As already stated, the total of immigrant aliens admitted in the fiscal year 1928-1929, 279,678, was the lowest since 1919. The decrease for the year 1928-1929 was largely confined to three countries, namely: Irish Free State, Canada, and Mexico. Immigration from the Irish Free State dropped from 24,544 in 1928 to 17,672 in 1929, or 28 per cent; from Canada it dropped from 73,154 to 64,440, or 12 per cent; and from Mexico from 59,016 to 40,154, or 32 per cent. There was an increase from nearly all of the other countries, particularly from England, Scotland, and Sweden, the total immigrants from all Europe being 158,513 in 1928 and 158,598 in 1929.

Aliens debarred during the year 1928-29 numbered 18,127, or 3.6 per cent of the 497,454 applicants at all ports. The percentage of rejections at the seaports was only six-tenths of 1 per cent; it was still smaller at the port of New York where 300,467 aliens sought admission, of whom 939 were debarred, or 3 denied admission out of every 1000 applicants. Aliens reported in 1928-29 under warrant proceedings totaled 12,-

908. The largest number of these deportees were sent to Mexico, 5481 going to that country, while 4227 went to Europe, 2185 to Canada, 370 to Asia, 308 to the West Indies, 235 to Central and South America, and 102 to the other countries.

In some quarters, the size of the Mexican immigration was regarded with alarm and bills were before Congress for the purpose of placing Mexicans on the restricted list (the Box-Harris bills). It was estimated that there were 1,200,000 Mexicans in the country who had become integral parts of the life of Texas, Arizona, and California, and, to a lesser extent, of New Mexico, Colorado, and Kansas. The Mexicans worked as unskilled laborers on large farms and on the railroads. In fact, the railroads of the Southwest were demanding that the prevailing restrictions (head taxes and visa fees) be lifted rather than quotas be imposed and pointed out that Mexican labor was seasonal, the Mexicans returning to their own country during the winter. In 1924, 89,339 Mexicans entered the country, as against 69,685 in 1927 and 57,765 in 1928. Opponents sought restriction on the grounds of racial purity and insisted that the Mexicans were of low intelligence and were the recipients of charity. The Secretary of Labor (Mr. Davis) opposed free Mexican immigration because it stood for cheap labor; the Secretary of State (Mr. Kellogg) was opposed to restriction because of the effect of this policy on the prevailing friendly relations with Latin-American countries.

Beginning with June, 1925, in Great Britain and the Irish Free State, the United States immigration service inaugurated the policy of examining immigrants at the port of embarkation before the granting of visas. The result of this policy was at once felt. By the end of 1926, about 90 per cent of the quota immigration was arranged for at European ports under American technical advisers, so that for that year the ratio of immigrants barred from entry at the port of New York was only 6 out of 1000 as against 40-50 per 1000 before the system was inaugurated. By the end of 1927, the ratio of barred immigrants was 4 per 1000. Technical advisers were attached to the consulates of 24 European cities in the following countries: Belgium, Northern Ireland, Norway, Germany, Irish Free State, Denmark, Italy, Scotland, Sweden, England, Czechoslovakia, Holland, Poland.

As a result of the quota law, bootlegging in aliens became one of the country's outstanding unofficial industries. The Secretary of Labor put the number of immigrants who had gained illegal entry into the country at 1,500,000. Cuba and the Bahamas served as relay stations in the illegal traffic with Florida as the objective. It was estimated that as many as 170,000 aliens were being smuggled into the country annually. In 1924 the immigration service inaugurated the border patrol to combat this situation. Patrols were divided into 11 districts scattered along the Northern and Southern borders. An idea of the effectiveness of this service may be gained from the fact that during 1927-28, there were apprehended 25,534 persons seeking unlawful entry into the country of whom 18,000 were smuggled aliens and 330 were smugglers of aliens. The Secretary of Labor (Mr. Davis) during the period besought Congress to pass legislation for the registration of aliens as the only complete method of coping with the situation. The measure was strenuously combatted on the score that it would mean unnecessary bureaucratic surveillance.

Beginning with July 1, 1928, the Department of Labor ruled that all aliens were to carry their passports as a source of identification, in this way hoping to control the later arrivals. In view of the fact that this did not affect those who had gained admission prior to that date, it was difficult to see how the regulation was to help matters for at least a generation. In fact, the enforcement of the Immigration Law was largely similar to the status of prohibition enforcement: the job was either to be done thoroughly by complete administrative control (at a great expenditure of money), or, in the course of events, it was inevitable to expect leakages. This was, of course, always one of the penalties of government by legislation as against government by consent.

**Asiatic Immigration.** Under the Chinese Exclusion Bill, and the "Gentlemen's Agreement" (1907) by which Japan bound herself to give no passports to laborers coming to the United States and to limit the number to Canada and Mexico, the influx of Asiatics had already been greatly restricted. The 71,531 Chinese residents in the United States at the census of 1910 had decreased to 61,686 in 1920. On the other hand, the number of Japanese had increased 53.86 per cent in the 10 years, from 72,157 to 111,025, an increase of about 30,000 in California and about 4000 in Washington. A growing protest against Oriental immigrants began to make itself heard. In 1914 two amendments to the general immigration bill were proposed and rejected, one to exclude all Asiatics except those with rights under existing agreements, and the other anti-Japanese. The Immigration Bill of 1917 contained a clause excluding Oriental laborers and directed chiefly at Hindus and Malays. Meanwhile, on the Pacific coast, feeling against the Japanese had been growing more intense. Not only was the Japanese, like other Orientals, considered unassimilable; the American farmer was not able to compete with his gift for intensive cultivation, his unflagging energy, and lower working and living standards; his growing numbers, and increasing success at the expense of other farmers, changed uneasiness into alarm. The desire for protection was reflected in State laws in California, Washington, Arizona, and Oregon. Not only the right to own land was taken from the Japanese; the right to lease it for three years, which had previously been allowed, was denied in 1920; in 1923 even croppage contracts were forbidden. Following this, there was incorporated in the immigration bill in 1924 a clause excluding would-be immigrants who were not eligible for citizenship, in abrogation of the "Gentleman's Agreement." During the lively debate that followed, the Japanese Ambassador, Hanihara, in a letter to the State Department, asked that Japan be given the opportunity to arrange the matter by treaty and called attention to the possibility of "grave consequences" if the Japanese were subjected to the indignity of such discrimination. His letter aroused much criticism, and was styled an attempt to intimidate and to dictate legislation on a domestic matter. Contrary to the advice of Secretary Hughes that Japan be placed on the quota basis, the bill was quickly passed by the Senate by a vote of 76 to 2. The House had previously passed the bill by a vote of 376 to 71. All Japanese, except ministers, members of the learned professions and arts, and students, with their wives and children, were barred. President Coolidge favored the general

principle of exclusion but recommended a delay till March, 1925, to arrange the matter by treaty with Japan, if possible. Congress, however, refused by a large majority to accept this recommendation, and the President, moved by other considerations, gave the bill his signature as it originally stood. It was pointed out that Japan was willing to coöperate in excluding any or all of her citizens and desired only that it be by a law putting her on a par with other nations or by a treaty. Perhaps the most convincing argument against the clause was the claim that it was unnecessary. Secretary Hughes had advocated that the Japanese be included in the 2 per cent quota provision, calling attention to the fact that the entailed admission of 250 immigrants a year was virtual exclusion. The President, in favor of settlement of exclusion by treaty, styled the measure "unnecessary and deplorable." There was much comment on the fact that in so vital a matter, affecting sensibly the general attitude of Japan toward the United States, the definitely expressed opinion of the President and Department of State could be overridden by a Congress without party control. The wiser counsels (though unheeded) of the President and the Secretary of State were borne out by subsequent events. During the year 1927-28, for example, 2957 more Japanese left the country than had entered it, and the decrease in the Chinese for the same year, as a result of heavier emigration, was stated at 1361. See RACE PROBLEMS, UNITED STATES.

**IMPERIAL CONFERENCES.** See BRITISH EMPIRE.

**IMPRESSIONISM.** See PAINTING; SCULPTURE; and MUSIC.

**INCANDESCENT LAMPS.** See ELECTRIC LIGHTING.

**INCE, THOMAS HARPER** (1880-1924). An American moving-picture director, born at Newport, R. I., and educated in the public schools. He was for several years an actor under Charles Frohman. In 1909 he was appointed general director of the New York Motion Picture Corporation and was later president of the Thomas H. Ince Studios and other companies. He directed many successful pictures.

**INCHCAPE OF STRATHNAVER, JAMES LYLE MACKAY, FIRST EARL** (1852- ). A British industrialist, born at Arbroath, Forfarshire, and educated at Arbroath and Elgin. Going to India in 1874, he was a member of the legislative council of the Viceroy (1891-93) and of the Council of India (1897-1911). As the King's special commissioner, he signed a commercial treaty with China in 1902. During the World War, he served on committees for imperial defence, food production, and port facilities. He was broker for the Government in the sale of its standard ships (1919), the 418 ex-enemy ships allotted to Great Britain by the Peace Treaty (1920-21), the Mesopotamian war craft (1920), and vessels taken during the War as prizes (1921-23 and 1927). In 1921-22 he served as a member of the Geddes National Economy Committee and in 1922-23 as chairman of the Indian Retrenchment Committee. When his daughter, Elsie Mackay, lost her life in an attempt to fly across the Atlantic, he gave her \$2,500,000 estate to the Empire as a memorial. He was created a baron in 1911, a viscount in 1924, and an earl in 1929.

**INCOME TAX.** See TAXATION IN THE UNITED STATES.

**INDEX NUMBER.** See COST OF LIVING IN THE UNITED STATES.

**INDIA.** The peninsula of Hindustan and the regions to the North, including all those territories governed directly and indirectly by the British. Total area, 1,805,332 square miles; total population in 1911, 315,156,396; in 1921, 318,942,480; gain in population for the decade, 1.2 per cent. Of the British provinces, losses for the decade 1911-21 were shown by Bihar and Orissa, Bombay, Berar, and the United Provinces of Agra and Oudah. Among the native states and agencies, the following declined: Central India Agency, Hyderabad, Rajputana Agency, and the United Provinces States. The heavy ravages of famine, the plague, and other diseases accounted for the population's remaining almost stationary. In 1919, for example, births were 30.24 per 1000 to 35.87 deaths; for 1920, births were 33 per 1000 and deaths were 30.8. The 1918 losses of population as a result of harvest failures and the influenza epidemic were among the severest recorded. The death rate in that year mounted past 62 per cent per 1000. Populations of the largest cities in 1921 were (1911 figure in parentheses): Calcutta, with suburbs, 1,327,547 (1,222,313); Bombay, 1,175,914 (979,445); Madras, 526,911 (511,660); Hyderabad, 404,187 (500,623); Rangoon, 341,962 (293,316); Delhi, the winter capital, 304,420 (232,837). By religions, the population in 1921 was divided as follows (1911 figure in parentheses): Hindus, 216,734,586 (217,586,900); Sikhs, 3,238,803 (3,014,466); Buddhists, 11,571,268 (10,721,449); Mohammedans, 68,735,233 (66,623,412); Christians, 4,754,079 (3,876,196); Animists, 9,774,661 (10,295,168).

**Education.** The 1921 census indicated that in spite of recent educational progress, the total illiteracy remained enormous. In Bengal, the most advanced of the provinces, 43,000,000 out of the total 47,000,000 were classed as wholly illiterate. Only some 500,000 of the women of Bengal might be classed as literate. The increase in education may be seen from the fact that in 1919-20, in a total of 202,981 institutions, there were in attendance in British India 7,612,839 (1,306,711 of these female), as compared with 6,128,725 (875,660 female) in 1912. The cost of maintenance of educational institutions in 1913-14 was £6,696,585; 1919-20, £14,889,696. The well-attended colleges and secondary schools seemed strangely out of place in a system where primary education was so largely neglected. This feature is one of the leading preoccupations of the administration during recent years, with the result that more attention is being applied toward reaching the masses. University supervision over the colleges is exercised by the six universities of Calcutta, Madras, Bombay, the Punjab, Allahabad, and Patna (established in 1917); the three residential universities of Dacca, Lucknow, and Rangoon; the two denominational universities at Benares (Hindu, established 1917) and Aligarh (Moslem); and the two universities in Indian states at Mysore (established 1916) and Hyderabad.

**Agriculture.** India is primarily an agricultural country. The monsoon, which lasts from June to September, is the chief controlling factor in crop production. The crops harvested during the winter (around February) are rice, sugarcane, castor beans, and groundnuts.

Wheat, rape, and mustard are gathered in the spring and sesame is harvested in the fall. There are two crops of cotton, one in April and one in October. In 1927 India enjoyed the sixth successive favorable monsoon. In the British Provinces in 1925-26, there were 304,811,000 acres of arable land (43 per cent of the total); 1,471,000 acres of trees, shrubs, and bushes; 86,934,000 acres of forest; 151,869,000 acres of uncultivated productive land; and 150,187,000 acres of unproductive land. In 1926 in the same provinces, there were 120,353,000 cattle, 30,480,000 buffaloes, 23,201,000 sheep, 39,295,000 goats, 1,684,000 horses, and 1,478,000 mules and asses. In the Indian states in 1925 were 28,821,000 cattle, 7,433,000 buffaloes, 13,591,000 sheep, and 11,248,000 goats. The coöperative movement in India is making comparatively rapid progress. At the end of 1926-27, there were in India 89,071 societies with a membership of 3,422,000, and a total capital of 679,400,000 rupees.

**CROPS: AREA, PRODUCTION, AND YIELD PER ACRE (Including Indian States)**

Crop	Area (thousands of acres)		Production (thousands of units—bushels except as indicated)	
	1913-14	1927-28	1913-14	1927-28
Wheat	28,496	31,089	312,368	334,059
Barley	7,157	.....	125,800	.....
Rice (rough)	76,000	77,790	1,435,000	2,144,000
Sugar cane	2,537	2,954	2,297	3,221
Oilseed	17,812	17,873	2,663	3,250
Cotton	25,027	23,812	2,026,000	2,192,000
Jute	3,352	3,371	4,192,000	4,092,000
Indigo	173	60	3,002	1,254

\* Not including Indian States.

† Unit, long ton.

‡ Incomplete.

§ Unit, pound.

**Mining.** The following comparative figures reveal the state of the mining industry over the period under discussion. Coal production: 1914, 17,565,000 tons; 1922, 19,010,986 tons; 1927, 22,082,336 tons. Gold production: 1913, 595,761 troy ounces; 1927, 384,272 troy ounces. Silver production: 1914, 236,446 fine ounces; 1921, 3,587,587 fine ounces; 1927, 6,024,806 fine ounces. Iron ore production: 1914, 441,674 tons; 1921, 942,084 tons; 1927, 1,846,735 tons. Manganese production: 1914, 622,898 tons; 1921, 670,286 tons; 1927, 1,129,353 tons. Petroleum production: 1914, 250,342,710 imperial gallons; 1927,

281,113,909 imperial gallons. Mica production: 1914, 4,537,000 pounds; 1921, 3,639,000; 1927, 2,043,394. Progress was thus inconsiderable. The average number of workers in the mines was 250,000, of which, in 1921, 65,786 men, 42,000 women, and 1171 children were engaged in the collieries. Legislation affecting mine workers prohibited the employ of children in the mines; fixed the maximum hours of labor at 54 hours a week; and gave the government power to regulate the conditions of women employed underground. In 1927 the average number of workers in the coal-mining industry was 180,532, with an output per capita of 122 tons.

**Manufacturing.** The weaving of cotton cloths continues the most important single industry and shows increases, too; the production of cotton cloth mounted from 1,164,292,000 yards in 1913-14 to 1,954,460,667 yards in 1926. Similarly, the manufacture of gunny bags and jute cloth rose from 487,848,000 bags and 447,309,000 yards of jute cloth (1914) to 500,000,000 bags and 1,482,107,000 yards of jute cloth (1926). The impetus that the World War gave to industry in India by cutting off the foreign sources of supply, and the encouragement accorded to industrialization by the existence of such large stocks of raw materials, were immediately perceptible. From 1917 to 1922, rice mills increased 12 per cent, engineering works 30 per cent, woolen mills 50 per cent, sugar factories 37 per cent, and flour mills 25 per cent. In all, the 4939 establishments of 1917 increased to 6140 in 1922; 1,252,606 workers of 1917 increased to 1,367,136 in 1922. The increased capitalization of joint-stock companies reflected the trend toward industrialization. The total paid-up capital of such companies increased from 750,000,000 rupees in 1913 to 2,770,319,000 in 1927. It is becoming evident that with encouragement of trade unionism, readjustment of wages, decreased cost of living, better housing conditions, and increasing interest in technical education, the status of labor is taking on an optimistic cast.

**Commerce.** During the World War, it did not take long for India to become readjusted to the new conditions. The insistent demand for foodstuffs, cotton materials, bagging, and hides from the Allies immediately put Indian raw materials at a premium. But for the depression of 1921, India's commercial activity showed an unbroken advance as is evidenced by the accompanying table.

**TRADE BY PRINCIPAL GROUPS OF COMMODITIES**  
(Thousands of Dollars)

Group	1913-14	1924-25	1925-26	1926-27	Per cent distribution 1926-27
<b>General imports*</b>	716,111	1,250,771	1,028,051	988,283	100.0
Food, drink, and tobacco	80,324	131,998	120,306	139,070	14.1
Raw materials and produce and articles mainly un-manufactured	34,886	76,043	76,656	74,336	7.5
Articles wholly or mainly manufactured	472,767	671,080	614,816	610,109	61.7
Live animals	9,361	1,098	1,262	1,517	.15
Postal articles not specified		11,876	12,734	13,488	1.4
Gold and silver, bullion and specie*	119,273	358,726	202,277	149,765	15.2
<b>Domestic exports</b>	818,338	1,409,107	1,381,389	1,099,967	100.0
Food, drink, and tobacco	210,870	381,294	300,230	270,297	24.6
Raw materials and produce and articles mainly un-manufactured	398,864	694,737	730,135	502,720	45.7
Articles wholly or mainly manufactured	177,804	304,614	327,019	309,247	28.1
Live animals		1,136	1,264	1,389	.12
Postal articles not specified		9,553	9,901	9,051	.82
Gold and silver, bullion and specie*	22,969	17,773	12,840	7,263	.66

\* Including currency notes since 1922-23.



**Transportation.** Railway line on Mar. 31, 1928, amounted to 39,711 miles, of which 23,426 miles were Imperial State lines, and 4988 miles belonged to Indian States, and the remainder to private companies. Additions to the lines totaled 871 miles in 1927-28 and several important new lines were commenced. Construction of 7000 miles during the five years ending Mar. 31, 1932, is planned.

STATISTICS OF RAILWAYS, MARCH 31		YEARS ENDED	
		1914	1927
Length of line, total	miles	34,656	39,049
Length of tracks		44,717	52,886
Locomotives	number	8,019	9,873
Passenger cars	"	22,381	26,469
Freight cars	"	171,741	230,839
Average capacity	long tons	9.1	18.0
Passengers carried	thousands	457,718	631,972
Passenger miles	millions	16,614	20,866
Freight carried	1000 long tons	82,613	112,966
Ton-miles	millions	15,623	20,375
Train-miles	thousands	57,923	57,923
Gross receipts <sup>a</sup>	1000 rupees	635,856	1,123,566
Passenger service	"	237,369	444,335
Freight service	"	377,749	653,563
Gross receipts, equivalent \$1000		206,272	407,293

<sup>a</sup> Including miscellaneous receipts not shown separately.

000,000 rupees, so that the estimated national debt amounted to 9,753,400,000 rupees on Mar. 31, 1927, as against 4,110,000,000 rupees in 1914. It should be noted, however, that 310,000,000 rupees of the annual deficit were covered by the inflation of the currency. Total revenues for 1913-14 for imperial and provincial governments, with the rupee rated at 15 to £1, were £85,207,000; expenditures, £82,895,000. Revenues for 1922-23 for the imperial government alone, with the rupee rated at 10 to £1, were £133,228,000; expenditures, £142,391,000. By the devolution rules, the following heads of revenue were allocated to the central government: opium, salt, customs, income tax, tributes, post office and telegraph, railways, mint, military services; the following to the provincial governments: land revenue, stamps, excise, forest, registration, irrigation, and civil departments. Provincial governments were required to pay annual contributions to the central government.

For the years 1924 to 1929, India's finances have prospered. Budget deficits have been turned into surpluses, provincial contributions have been abolished, the cotton excise duty has been removed, and the rupee has been stabilized. With

#### ENTRANCES AND CLEARANCES OF VESSELS IN FOREIGN TRADE

Item	Entrances				Clearances			
	1913-14	1924-25	1925-26	1926-27	1913-14	1924-25	1925-26	1926-27
Number of vessels	4,294	3,932	3,783	3,682	4,323	4,090	3,840	3,756
Capacity (1000 net registered tons):								
Total	8,624	8,614	8,302	8,345	8,762	9,042	8,834	8,694
With cargo	6,785	6,989	7,103	6,982	8,252	8,590	8,181	7,890
In ballast	1,839	1,625	1,199	1,363	510	452	653	804

**Finance.** Beginning with 1921, a policy of devolution was applied to the Indian budget whereby the provincial revenues and expenditures were separated from the central government accounts. Incidentally, the budget of 1921-22 was the first submitted to the Legis-

lature. The improved situation, India is now looking forward to greater expenditures in national development. The revised budget of 1926-27 estimated a surplus of 20,600,000 rupees and the estimates for 1928-29 anticipated a surplus of 26,300,000 rupees. The public debt which in-

#### RECEIPTS AND EXPENDITURES OF THE CENTRAL GOVERNMENT (Thousands of Rupees)

	1913-14, actual	1924-25, actual	1925-26, actual	1927-28, budget
<b>Receipts</b>	657,765	1,380,392	1,333,299	1,252,565
Customs	111,378	457,532	477,795	487,337
Income tax	29,052	160,148	158,593	169,505
Salt	51,509	73,905	63,297	70,000
Opium	24,335	37,976	41,500	38,308
Other taxes	18,243	20,693	21,260	22,706
Railways (net)	264,850	372,295	344,013	349,713
Posts and telegraphs (net)	8,735	11,125	8,635	5,807
Contributions by provincial governments	98,300	92,621	62,409	(*)
All other	51,863	154,197	155,797	109,189
<b>Expenditures</b>	696,890	1,323,567	1,300,180	1,252,565
Direct demands on revenue	31,764	53,702	53,759	43,030
Debt service (general debt)	19,439	186,823	183,425	157,434
Military services	318,986	596,652	603,937	567,249
Railway-debt charges	192,504	304,453	289,109	294,905
Posts and telegraphs (debt charges and capital outlay)	3,853	3,088	10,190	8,461
Civil administration	51,598	101,259	107,648	113,139
All other	78,746	77,590	72,492	68,347
Equivalent (\$1000): <sup>a</sup>				
Receipts	214,284	457,876	486,787	454,806
Expenditures	226,977	439,027	474,696	454,806

<sup>a</sup> Remitted for 1927-28.

<sup>b</sup> Including 63,807,000 rupees transferred to reserve.

<sup>c</sup> Stores and manufacture suspense balance transferred from capital expenditures met from revenue to capital expenditures not charged to revenue.

<sup>d</sup> Conversion rates: 1913-14, \$0.3257; 1924-25, \$0.3317; 1925-26, \$0.3651; 1927-28, \$0.3631 (calendar year 1927).

lative Assembly. Strenuous measures to check the advancing expenditures, the chief concern of Indian financing for the five years, 1919-24, were of no avail, for deficits steadily mounted. The annual deficits of the period totaled 1,000,-

creased rapidly from 1919-20 to 1923-24 has since increased relatively little.

**Immigration.** In 1916 it was announced by the Indian government that the policy of providing for the eventual abolition of indentured

labor in Jamaica, Trinidad, British Guiana, Dutch Guiana, and Fiji, had been accepted by the Secretary of State for India. The system, which had been inaugurated in 1842 and had been pressed by licensed agents, had led to annual migrations of 10,000 coolies, on an average, for work under contract. The permanent settlement of these coolies in Africa, in particular, had led to vexing internal problems. (See KENYA; SOUTH AFRICA, UNION OF.) The result had been the prohibition of such emigrations to Natal and Mauritius (1910) and then (1917) to the areas cited above. The decision to put an end to this system was received with approval by the Indians, who had always regarded contract labor as a form of slavery.

**Government.** In 1919, in order to hasten a more effective native participation in Indian affairs, the Government of India Act was passed, effective for 1919-29. It was based on the report formulated by the Secretary of State for India, Mr. Montagu, and by Lord Chelmsford, the Viceroy. The keynote of the report was the recommendation of a progressive movement toward responsible government founded on a native ministry. With this as its purpose, the Act incorporated the idea of a dual form of government for the major provinces, i.e., the Presidencies of Madras, Bombay, and Bengal; the United Provinces, the Punjab, Bihar, Cissa; and the Central Provinces, Assam, and Burma. This system, called "dyarchy," consists of the division of provincial matters into two groups, viz., "reserved subjects" over which the governor-in-council of the province retains control, and "transferred subjects" over which the provincial ministry is the final arbiter. The transferred subjects include local self-government, medical administration, public health and sanitation, education, public works, agriculture, fisheries, coöperative societies, excise, registration, adulteration, weights and measures, and religious and charitable endowments. The governor-in-council was in charge of the reserved subjects; the governor and a responsible ministry were in charge of the transferred subjects. The purse for both branches was held in common, and definite sources of revenues were assigned the provinces (see above, *Finance*). Responsible government was assured by making the provincial ministers, appointed by the governor of each province, answerable to the provincial legislative council, at least 70 per cent of whose members were to be elected. Representation by special interests was provided for; the franchise was extended, and in Madras (by statute) and in Burma, women were given the ballot. For example, of Bengal's 139 members, 113 were elected, 20 were nominated officials, and 6 were nominated non-officials representing special interests. The governor's powers remained large; he was permitted to withdraw from consideration or to pass over the heads of the council any legislation which he considered jeopardizing the tranquillity or safety of his province. Incidentally, he was the focal point to which the affairs of the executive council, the legislative council, and the larger concerns of the central government radiated.

Responsible government was not the rule of the central government. In place of the unicameral House, there was the two-chamber Legislature, made up of the Council of State and the Legislative Assembly. The Council of State consists of 60 members, only 20 of whom were to

be nominated members. The Legislature Assembly was to be made up of 144 members, of whom only 26 of the 41 nominated members could be officials; the other 103 were elective. The Governor General, or Viceroy, was not a member of the Legislature, but for the direction of affairs, he was to have to aid him an Executive Council consisting, in 1923, of 8 members. The Governor General had the power of enacting legislation, subject to the approval of Parliament, and of vetoing legislation that affected the tranquillity or safety of the country. Within clearly defined limitations, the annual budget was to be submitted to the Legislative Assembly and Council of State for their approval, though the Governor General might certify any item in the budget, or even the whole of it. The Act of 1919 also provided for the appointment of a high commissioner for India resident in London. For the visit of the Simon Commission to India in 1928-29, see below, under *History*.

**History.** The outbreak of the World War found India tranquil. The pledges of loyalty and the offers of money and munitions which poured in reassured the home government that any effort in the war prosecution would not meet with an organized opposition. The result was that India was stripped of its internal defenses to a remarkable degree, so that men and war materials might be dispatched to the theatres of war. By 1916 upward of 300,000 men, both British and natives, had left the country. Indian contingents saw service in France, Egypt, East Africa, Gallipoli, and Mesopotamia. The campaign in Mesopotamia was under the exclusive control of the Indian government. Even the entry of Turkey into the War failed to stir up any considerable discontent. Recruiting was pushed vigorously; a war munitions board controlled the output of materials; and a loan of £100,000,000 was floated for the aid of the Empire. The active measures taken by the government in the regulation of prices and exports and the increased prosperity which came to the population from the sale of raw materials served further to assure tranquillity.

Lord Hardinge was followed by Lord Chelmsford as Viceroy in 1916. The latter's administration was confronted by an awakened nationalistic sentiment taking on greater proportions as the War progressed, and echoed in a growing repressive policy on the part of the Indian government. Under the lead of the National Congress and the Moslem League, the demand for Indian Home Rule became widespread. In 1916 the proposal formulated at the meeting of the two organizations at Lucknow became the official statement of policy of the dissidents and received wide currency as the agitation continued. Unfortunate official tactics added fuel to the flames. Mrs. Annie Besant was in 1917 compelled by the Madras government to quit the city and confine her activities to certain delimited areas. It became increasingly necessary for the home Government to make a clear-cut pronouncement of its policy as Lord Chelmsford's position became more difficult.

In 1917, Edwin Samuel Montagu, who had just come to the Indian Office after the resignation of Austen Chamberlain, realizing the changed state of affairs in India, as well as the new attitude toward the country in the whole Empire, made a declaration promising radical reforms. The chief point of his statement was that an increasing measure of self-government for India was

inevitable. In the winter of 1917 and into 1918, Montagu, together with Lord Chelmsford, held extended hearings in India, resulting in the Montagu-Chelmsford Report. The findings set forth the proposal that self-government be tried just in the major provinces under a limited scheme, and that, for the whole of India, complete home rule was as yet inadvisable because of the dissimilar elements in the population and the general unpreparedness. Some moderate elements in the Indian population expressed their approval, but their attitude was overshadowed by the pronounced disappointment and indignation of the thoroughly conscious Indian Nationalists, who regarded the proposed reforms as utterly inadequate. On Sept. 1, 1918, the Indian National Congress at Bombay unanimously rejected the reforms. Counter-proposals demanded the extension of the dual government idea to the central government of India and the abolition of the Council of State. Other resolutions passed called for a guarantee of full responsible government within 15 years, equal rights for women, and a large proportion of native Indians in the civil service. Meanwhile, the suggestions embodied in the report had been incorporated in the Government of India Bill, which passed the British Parliament in December, 1919. See above, *Government*.

India's war effort may be summarized here. In men, India had contributed upward of 1,250,000 recruits, of whom some 30,000 had died overseas as a result of wounds and disease. A loan of £100,000,000 had been guaranteed. India had been the sole source of supply for the operations in India, Mesopotamia, and Egypt in respect to a great variety of commodities, including butter, oatmeal, tinned beef, mutton, biscuits, boots, wearing apparel, as well as 1500 miles of railway, 4500 vehicles, and 250 engines. Strong measures in 1918 had prevented an invasion of India from the North after the collapse of Russia, and the friendly relations with Afghanistan had kept that country well disposed during the War. In all, considering the usual poverty of the great proportion of India's population, the effort had been extraordinary. No doubt the following unrest was engendered by the after-effects of the War.

The years immediately following the War saw increasing disorder. Matters were brought to a head in March, 1919, by the passage of the untimely anti-sedition Rowlatt Acts giving the Governor General extraordinary powers in acting against revolutionary suspects. They created a furore. Indian leaders universally condemned them and the Indian National Congress denounced them and passed resolutions of a radical tenor, including a demand for self-determination and the appointment of a commission comprising Tilak, Gandhi, and Hassan Imam to put the Indian case before the Peace Conference. As a result of the activities of M. K. Gandhi, the Passive Resistance League was formed at Bombay. The movement quickly spread through northern India and frequent disturbances followed, with rioting and fighting at Delhi, Amritsar, and other places. Martial law was declared over the district of Lahore, from April to June. The now admitted intemperance of the British in suppressing these disorders and such incidents as the arrest of Gandhi further inflamed the populace. On Apr. 13, 1919, an outbreak which reached tragic proportions occurred at Amritsar. As a

result of the zeal of General Dyer, British soldiers fired on a meeting of unarmed Indians, with the result that 400 were killed and at least 1000 wounded. See GANDHI, M. K.

Affairs were rendered more serious by the outbreak of the Afghan War, following the accession of the Amir Amanulla, who attempted to surprise the Indian Army by moving his troops into the Khyber Pass, but was checkmated by a hasty mobilization. The Capture of Dacca and the bombing of Kabul and Jalalabad brought him to terms and a treaty was signed in August, 1919. The Waziristan campaign against neighboring tribes, however, was not concluded until May, 1920. The cost of these two operations was £15,000,000. Meanwhile in India, the Nationalistic agitation continued. Late in 1919 Gandhi inaugurated a "noncoöperation" movement which received the approval of the Indian National Congress in 1920. Boycotts against the courts by lawyers, against the legislative councils by public men, against foreign imports by consumers, against educational institutions by students, became the rule. The hostility was reflected in England where Montagu was severely attacked in the House of Commons and General Dyer was penalized by retirement and a vote of censure.

The anti-Mohammedan character of the Treaty of Sèvres was responsible for serious disorders in southern India, rioting in Malabar being frequent throughout 1921. The influence of Gandhi showed no signs of weakening. His "civil disobedience" policy, marked by a refusal to pay taxes and to coöperate with the Government, was approved by the Indian National Congress of 1921, which discountenanced a policy of violent resistance. The boycott of English cotton goods, etc., spread over the country. When the Prince of Wales visited India in November, 1921, rioting occurred all along his route. Among the Liberals in England, the methods employed by the British government in putting down these outbreaks aroused unsparing criticism, and quite evidently the policy enlisted only a reluctant consent from Montagu and Lord Reading, the new Viceroy. Montagu, finally, was asked to resign following his publication of a dispatch from the Indian government setting forth Moslem objections to the Treaty of Sèvres.

In spite of Gandhi's protests, Indian resistance frequently took the form of violence, tax collectors particularly being subjected to indignities. On Feb. 9, 1922, the Government took the summary step of ordering Gandhi's arrest on the charge of sedition. After a brief hearing, he was found guilty and sentenced to prison for six years. For the moment, this act only strengthened the resolve of the Nationalists, who, late in 1922, formally rejected the proposal to seek seats in the Legislative Assembly; but it became increasingly evident in 1923 that noncoöperation was doomed. The boycott was a failure, and Gandhi himself advised the Indian National Congress meeting at Delhi in September, 1923, to abandon it, and to relinquish noncoöperation at least temporarily and contest seats in the national and provincial assemblies. In the elections for the second Legislative Assembly late in 1923 the Swaraj Party headed by Das announced a programme of obstructionist tactics in their participation in the government, and secured 50 out of the 145 seats, as well as a preponderating majority in the Central Provinces. Disorders did not abate. They were, however,

due to other antagonisms as well as the resistance to British rule. Communism was gaining a sure foothold in India, as indicated by the Government's energy in dealing with suspects, while the perennial Hindu-Moslem feud broke out frequently in open fighting.

In July, 1923, the last session of the first Legislative Assembly closed. Its initial steps had been taken with so much caution that doubt was expressed in British circles as to whether its work was of a nature to justify its existence. The rise of the Labor Party to power in Great Britain did not materially affect the situation. True, Gandhi was released, on Feb. 4, 1924, because of illness, and Sir Sidney Oliver, appointed to the Indian Office, was a champion of equal rights; but the British Labor government proceeded to reject the native Assembly's demand for a round-table conference on home rule, and point was given to this general attitude when Ramsay MacDonald issued a warning against the entertainment of too sanguine hopes. Hostility thus became general and outspoken once more. On March 17, the Swaraj majority rejected the Government's budget in the Legislative Assembly, which had convened January 31; three days later, in spite of the recurrence of disorders, the Assembly voted to deprive the Government of summary power. The only answer the British government could give to all this was the appointment of a commission to consider defects in the Government of India Act of 1919, and not a wholesale revision.

The committee reported early in 1925 that the time was not yet opportune to consider constitutional changes. While the Nationalist agitation was passing through these various phases, the Communist menace continued to be more and more in evidence. In 1924 the Government discovered what appeared to be a widespread revolutionary conspiracy, especially prominent in Bengal, and special powers were given to the Bengal government to deal with it. When on Dec. 24, 1924, the executive committee of the Indian National Congress accepted Gandhi's advice to abandon the noncooperation movement, the beginning of the end of that line of tactics was seen. It may be considered as having come definitely to a close in 1925 when the Council of the Swaraj Party, to which the centre of gravity of Indian resistance had gradually shifted, announced that under certain conditions it was willing to work with the Government if a Dominion status should be granted to India by Great Britain.

In June, 1925, the Swarajist leader, C. R. Das, died and his party position in the Legislature was taken by Pandit Motilal Nehru. With Gandhi in retirement, a period of comparative political quiet ensued in India, broken chiefly by ever-recurring religious riots. In the spring and summer of 1926, they were especially frequent and resulted in the death of more than 100 persons. Both the Indian Nationalists and the British authorities endeavored to bring the opposing religious bodies together. Lord Irwin, who succeeded Lord Reading as Viceroy in April, 1926, continually urged the importance of harmony between them if the country expected to assume greater control of its own affairs. The elections held in December, 1926, further confirmed the decline of Nationalist feeling, as the Swarajists lost 9 of their 46 seats in the Legislature. However, the extremists controlled the meeting of the Indian Congress at the close of

the year at which a favorable attitude toward noncooperation measures was taken.

It was the continuance of the tense religious antagonism, according to report, which induced the British government, toward the close of 1927, to take the important step of appointing a commission to investigate the whole subject of the government of British India. This anticipated by two years the action provided for in the Government of India Act of 1919, under which a 10-year experiment was to be carried on in gradual transfer of governmental functions from British to Indian shoulders. The commission appointed was a distinguished one, headed by Sir John Simon. When its personnel was announced in November, the fires of nationalism blazed up hotly again in India because of the fact that no Indian representatives were included on the commission. The British government, however, had provided for systematic cooperation in the investigation by committees of the national and provincial legislatures of India, and for a full hearing of the presentation of the Indian case by a parliamentary joint committee before any action on the report should be taken.

These provisions were deemed inadequate by the Nationalists in India. A wave of opposition swept over the country and in December the Indian National Congress proclaimed a boycott on the Simon Commission and took its stand for full independence for India. At this Congress and elsewhere, renewed efforts were also put forth to obtain greater Hindu-Moslem unity, but with no great success. The Moslems, greatly in the minority in the country, held back from the Nationalist movement because of the fear of oppression by the Hindus under a system of self-government, and in general supported the British authorities and opposed the boycott of the Simon Commission.

The year 1927 was marked by further religious rioting. The Simon Commission made a preliminary visit to India in February, 1928, returning to England April 7. Its presence served to accentuate the opposition which had flamed up on the announcement of its appointment, and the hostility found expression in strikes and riots, in the refusal of the Legislative Assembly to cooperate in the investigation, and in a general increase in popular restlessness. In October, the commission returned to India and entered in earnest on its work of touring the country and taking evidence. While it received the help of committees of practically all the provincial legislatures, the strong reaction against it throughout the country continued to be pronounced, and was reflected, among other things, in the unhelpful attitude of the National Legislature on other matters than the work of the commission. On September 24, the Government's much desired bill to permit the deportation of alien Communists or other dangerous agitators was lost when the President of the Assembly broke a tie vote by casting his ballot against the bill on the ground that it was unnecessary. Communist agitation, nevertheless, had become particularly troublesome. Extended labor difficulties also marked the summer of 1928, particularly in the textile industry in Bombay, where a strike lasting from April to October slowed down the city's whole industrial life, and also in the steel industry and in railway activities.

Toward the close of 1928, two important conferences took action bearing on the home-rule question. In December, the annual meeting of

the National Congress fully indorsed the report of the Nehru committee, which in May, at a conference in Bombay of representatives of many parties, had drawn up a proposed Constitution for India providing among other things for a Dominion status for the country. At this December meeting, a resolution offered by Mahatma Gandhi was adopted stating that unless the Nehru Constitution should be put in force before the end of 1929, the noncooperation movement, including nonpayment of taxes, would again be revived. An important All-India Moslem conference also met in December for the purpose of formulating a political programme for the protection of the rights of the Moslems of India. It declared for a federal system for India and for various safeguards of Moslem minorities, and resolved to oppose any constitution which did not incorporate these provisions.

While the Simon Commission was at work, a special committee presided over by Sir Harcourt Butler was also busy with an important collateral inquiry into the relations between the British government and the larger number of native states which maintain a semi-independent status under their own rulers. Comprising about one-fifth of the population of India, these states are bound to the Empire by ties defined in various treaties. They are represented in a Chamber of Princes, which has only conference powers but serves as a voice for their common interests. In February, 1929, this Chamber declared unanimously against any form of government for India which would dissolve the British connection. In May, a conference of representatives of subjects of these native states declared for a unified federal government for all India, a proposal to which the rulers themselves are cold. The Butler committee, however, had already reported on April 17, stating that it could find no practicable method for bringing the native states and British India together in a federated commonwealth, and that two Indias must continue to be recognized.

The first part of 1929 was a period of great agitation in India in which all the chief causes of unrest had a part. Communist propaganda increased to such an extent that the Government felt it necessary to make a hundred arrests for sedition in the principal cities. The Government also introduced into the National Legislature the Anti-Communist Bill which had been defeated in the year before, with a further provision permitting the seizure of funds brought into the country for Communist propaganda purposes. While this bill was being debated, on April 8, with Sir John Simon present, two bombs were exploded among the Government members, while Communist leaflets were dropped from the balcony. Several members were injured. Four days later the Viceroy passed the bill by ordinance. In February, religious warfare again broke out in Bombay, where several hundred people were reported killed, and the rioting spread over the whole land. Mahatma Gandhi again led a movement against the use of British cloth, and although he was arrested and fined, the movement went on with various damaging results. The Simon Commission returned to England in April and its report was awaited with the keenest interest.

**INDIANA.** The thirty-seventh State in size (36,354 square miles) and the eleventh in population; capital, Indianapolis. The population increased from 2,700,876 in 1910 to 2,930,390 in 1920, a gain of 8.5 per cent; estimated popula-

tion, 1928, 3,176,000. The white population rose from 2,639,961 (1910) to 2,849,071 (1920); Negro, from 60,320 to 80,810; native white, from 2,480,639 to 2,698,203. Foreign-born whites decreased in number from 159,322 to 150,868. The urban population mounted from 1,143,835 in 1910 to 1,482,855 in 1920; the rural fell from 1,557,041 to 1,447,535. The principal cities grew as follows: Indianapolis (q.v.), 233,650 to 314,194; Fort Wayne, 63,933 to 86,549; Evansville, 69,647 to 85,264; South Bend, 53,684 to 70,983.

**Agriculture.** Indiana is one of the chief agricultural States and general conditions in the years since the War have reflected fluctuations in the local production and prices of the chief products, particularly grains. For a full discussion of this general situation, see AGRICULTURE, CORN, WHEAT, OATS, etc.

The rural population declined from 65.7 per cent in 1900 to 57.6 per cent in 1910 and to 49.4 per cent in 1920. The number of farms decreased 4.5 per cent, or from 205,126 in 1920 to 195,786 in 1925; the total acreage in farms from 21,063,332 in 1920 to 19,915,120 in 1925. The improved land in farms embraced 16,680,212 acres in 1920; crop land acreage in 1925 was 11,981,079. The total value of farm property rose from \$1,809,135,238 in 1910 to \$3,042,311,247 in 1920, but declined to \$1,931,742,483 in 1925; the average value per farm was (1910) \$8396; (1920) \$14,831; and (1925) \$9867. Prices of farm land increased greatly, stimulated by war-time prices for products. In interpreting these values, the inflation of the currency incident to the World War is to be taken into consideration. The percentage of land in farms decreased from 92.3 in 1910 to 91.3 in 1920. Of the farms in 1925, 137,429 were operated by owners; 1268, by managers; and 57,089, by tenants. The comparative figures for 1910 are 148,501, 2297, and 64,687. White farmers in 1920 numbered 204,554, compared with 214,680 in 1910; colored farmers, 572, compared with 805. The farms reported as under mortgage in 1920 numbered 51,474; in 1925, 49,960. The total number of cattle in 1920 was 1,546,095; in 1925, 1,281,810. Dairy cows numbered 946,401 in 1920, 596,379 in 1925; swine, 3,613,906 in 1920 and 2,939,074 in 1925; sheep, 643,889 in 1920 and 595,461 in 1925. The estimated production of the principal farm crops in 1928 was: Corn, 161,322,000 bushels; wheat, 9,590,000; oats, 93,684,000; rye, 946,000; potatoes, 6,649,000; tobacco, 11,234,000 pounds; and hay, 2,504,000 tons. Comparative figures for 1913 are: Corn, 176,400,000 bushels; wheat, 39,775,000; oats, 36,380,000; rye, 1,566,000; potatoes, 3,975,000; tobacco, 11,925,000 pounds; and hay, 1,800,000 tons.

**Mining.** Indiana ranked eleventh among the States in the value of its mineral products in 1927. These are almost entirely nonmetallic; in the order of their value, they are coal, cement, stone, and clay products. There is also a large quantity of petroleum. During the period starting with 1914, coal production showed considerable fluctuation, indicated by the following comparative values: In 1914, 16,641,132 short tons, valued at \$18,290,928; 1917, 26,539,329 at \$52,940,106; 1918, 30,678,634 at \$70,384,601; 1919, 20,912,288 at \$46,345,750; 1920, 29,350,585 at \$92,867,000; 1921, 20,319,509 at \$52,269,000; 1926, 23,186,006 at \$45,889,000; in 1927, 17,935,758, at \$36,381,000; and 1928, 16,378,580, at \$29,212,000. The production in 1922 and again



in 1927 showed a decrease, due chiefly to protracted coal-miners' strikes in the Middle West. Cement ranged from 9,595,923 barrels in 1914 to 10,050,433 in 1916 and 5,291,851 in 1918. The value of clay products showed a considerable change, largely the result of the fluctuating purchasing power of money, and the consequent shifts of prices during the period. The value in 1914 was \$7,655,285; in 1920, \$15,494,795; in 1921, \$11,199,024 in 1926, \$18,747,825. The output of stone increased in value from \$4,136,132 in 1914 to \$22,797,189. Petroleum production during the period varied from 1,335,456 barrels in 1914 to 769,036 in 1916; 1,158,000 in 1921; 1,087,000 in 1922; and 852,000 in 1927. In addition to the minerals noted above, the State produces coke, sand and gravel, and pig iron. The limestone produced for construction in 1928 amounted to 14,520,060 cubic feet valued at \$17,760,022. The total value of the mineral production in 1926 was \$118,692,304; compared with \$146,736,294 in 1920; \$82,270,784 in 1919; \$96,558,784 in 1918, and \$42,864,267 in 1914.

**Manufactures.** Indiana is an important manufacturing State. It has 31 cities with a population over 10,000, and six of these, Evansville, Fort Wayne, Gary, Indianapolis, South Bend, and Terre Haute, have 50,000 or more. Of these cities, 29, with a combined population of 37.8 per cent of the total for the State, in 1919 had 62.5 per cent of the value of the manufactured products. There were 7969 manufacturing establishments in the State in 1909; 7016 in 1919; 4702 in 1925; and 4726 in 1927. Wage earners engaged in manufactories numbered 277,580 in 1919, 280,633 in 1925, and 280,717 in 1927. The capital invested in 1909 was \$508,717,197; in 1919, \$1,335,714,103. The value of the products in 1909 was \$579,075,046; in 1919, \$1,898,753,387; in 1925, \$2,125,382,017; and in 1927, \$2,153,479,432. The increase in the value of the products about 1919 was due largely to the change in industrial conditions brought about by the War and cannot properly be used to measure the normal growth of manufactures; but the increase in the number of wage earners clearly indicates a decided growth in the manufacturing activities of the State. The first industry in point of value of products is that connected with iron and steel works and rolling mills, the value of which was \$38,652,000 in 1909; \$109,274,000 in 1919; \$343,236,025 in 1925. Slaughtering and meat packing attained a total of \$47,289,000 in 1909; \$51,022,000 in 1914, and \$134,029,000 in 1919. Automobile production was valued at \$23,764,000 in 1909; \$179,065,000 in 1919; \$233,589,813 in 1925. The manufacture and repair of steam railways had products in 1909 worth \$9,498,000; in 1914, \$21,570,000, and in 1919, \$86,021,000. Indianapolis is first among the cities of the State in manufactures, having 853 establishments in 1909, with a product of \$126,313,000; 1004, with \$398,667,000 in 1919; and products totaling \$344,925,000 in 1925. There were 218 establishments in South Bend in 1909, with products valued at \$27,855,000; 250, with \$31,180,000 in 1914, and 214, with \$75,339,000 in 1919. Similar figures for Fort Wayne are 230, with \$23,687,000 in 1909; 228, with \$30,205,000 in 1914; 247, with \$76,713,000 in 1919.

**Education.** Indiana has always been in the forefront among the States in the interest of its citizens in education, and great progress was made of late years. In 1913 the Legislature

enacted three measures which had an important effect on the schools of the State; the Vocational Educational Law, the High-school Inspection Law, and a Compulsory-attendance Law. Succeeding Legislatures amended these laws and passed others. The Legislature of 1920 enacted the Minimum-wage Law for teachers, fixing the minimum at \$800, which became effective in 1920-21. The general Senate of 1921 enacted the Compulsory-attendance Law providing that employment certifications shall not be issued until a pupil has completed the elementary school course. The establishment of a division of teacher training, doing excellent work, was followed by improvement in ability of the teaching force. In 1921-22, 98 school corporations conducted schools in one or more of the fields of agriculture, home economics, and industry, with nearly 20,000 pupils enrolled. The Division of Vocational Rehabilitation, charged with the duty of returning physically disabled civilians to profitable employment, was eminently successful. In 1922-23 the General Education Board made a comprehensive investigation of the public-school system of the State and recommended sweeping changes in regard to a State school administration, local school administration, and the training and certification of teachers. The enrollment in the public schools in 1914 was 548,497, including both elementary and high schools; in 1925-26 it was 635,227; of this number, 488,780 were in elementary and 146,447 in high schools. The expenditures for education in the public day schools of the State in 1925-26 were: current, \$50,776,866; outlays, \$10,452,228. The percentage of illiteracy in the State decreased from 3.9 in 1910 to 2.8 in 1920. Among the native white population, it fell from 3 per cent in 1910 to 1.8 per cent in 1920; among the Negro, from 17.5 to 11.7; among the foreign-born population, illiteracy increased from 11.8 to 12.4.

**Finance.** State expenditures in the year ending Sept. 30, 1927, as reported by the U. S. Department of Commerce, were: for maintenance and operation of governmental departments, \$26,194,760 (of which \$5,233,413 was aid to local education); for interest on debt, \$77,600; for permanent improvements, \$13,846,016; total, \$40,118,382 (of which \$17,287,205 was for highways, \$6,839,494 being for maintenance and \$10,447,711 for construction). Revenues were \$43,078,196. Of this, property and special taxes furnished 34.7 per cent; departmental earnings and charges for officials' services, 10 per cent; and sales of licenses and the tax on gasoline 39.8 per cent. Property valuation was \$5,188,356,739; State taxation thereon, \$11,933,220. Net State debt on Sept. 30, 1927, was \$1,640,500.

**Political and Other Events.** In 1914 though the Democratic vote showed a decrease of about 10,000, Senator Shively, Democrat, was reelected. The Democrats also elected 11 representatives to Congress. In the presidential election of 1916, both candidates for vice president were residents of Indiana. As a result of the election, the Republican Party was returned to power; James P. Goodrich was elected governor. Owing to the death of Senator Shively in 1916, it was necessary to elect two senators. James E. Watson and Harry S. New, both Republicans, were elected. For President in 1916, Charles E. Hughes received 341,005 votes; President Wilson, 334,003. In the elections of 1918, the Republicans elected the entire State ticket. On Aug. 2,

1918, the State came under the operation of the "bone dry" Prohibition Law. Warren T. McCray, Republican, was elected governor in 1920, and James E. Watson, Republican, was reelected United States Senator. In the voting for President, Warren G. Harding received 696,370 votes; James M. Cox, 511,364. In 1921 a special election was held on September 26 and an amendment conferring full suffrage on women and prohibiting aliens from voting until they were fully naturalized was adopted. Samuel M. Ralston, Democrat, former Governor of the State, was elected Senator in 1922. On Mar. 31, 1921, the Mayor of Gary, Roswell C. Johnson, and other officials, were found guilty of a liquor conspiracy and were sentenced to fines and terms of imprisonment. Gov. Warren T. McCray was indicted for fraudulent misuse of the mails and for other offenses in 1923, and in 1924 he was found guilty and sentenced to a term in the Federal prison in Atlanta.

In the election of 1924, the vote of the State for President was: Coolidge, 703,042; Davis, 492,245; LaFollette, 71,700. The Republican candidate, Ed. Jackson, was elected governor. He was charged in 1927, while in office, with having offered a bribe to McCray when the latter was governor. Tried on this charge in 1928, Jackson was acquitted under the statute of limitations. In 1926 and 1927 inquiries were conducted, concerning alleged corrupt practices connected with officials of the State Ku Klux Klan organization, of which the former Grand Dragon, D. C. Stephenson, had been sent to prison on a criminal charge. Mayor John L. Duvall of Indianapolis was convicted in 1927 of having made a corrupt political bargain in 1925; he was deprived of office and condemned to prison for 30 days. In 1928 the vote of the State for President was: Hoover (Republican), 848,280; Smith (Democratic), 562,691. Harry G. Leslie (Republican) was elected governor; A. R. Robinson (Republican) was elected United States Senator.

**Legislation.** In 1915 several important measures were passed, relating to electoral reform and liquor regulation, and also a workmen's compensation law. The Legislature of 1917 passed an act providing for a constitutional convention, granted women the right to vote, and enacted the State-wide "bone dry" Prohibition Law which went into effect on Apr. 2, 1918. In 1919 a measure was enacted giving the State Board of Tax Commissioners power over State and local levies and municipal bond issues, and women were given the right to vote for President. The Legislature recreated the legislative reference bureau which had been permitted to lapse in 1917. Measures also were passed forbidding the display of the red flag or any other symbol or emblem calculated to excite hostility or violence against the Government. The Legislature of 1921 enacted the Pure Agricultural Seed Law, provided for the creation of an executive State budget, and authorized cities to create city-planning and zoning commissions. In 1923 the Legislature passed a measure for establishing equal rights for women, abolishing the legal disability of married women to make contracts and allowing them to hold property as if single. At this session, the penalties for violating the Prohibition Law were increased, and a uniform stock transfer act was passed. In 1927 the Legislature repealed the requirement of registration as a prerequisite to voting; redefined the

crime of voluntary manslaughter; and made possible State sterilization of defectives.

**INDIANAPOLIS.** The capital and largest city of Indiana. The population rose from 233,650 in 1910 to 315,746 in 1920 and to 382,100 in 1928, by estimate of the Bureau of the Census. The area is 50.43 square miles. A city planning commission of nine members was created in 1921, and in the year following a comprehensive zoning plan with distinct use, height, and area districts was adopted. In 1927 at a special election, Indianapolis voted to adopt government by commission and manager, the change to take effect Jan. 1, 1930. The city purchased the privately-owned reduction works in 1918; in 1924 it built a new sewage plant using the activated-sludge system. Indianapolis has 796.84 miles of streets, 591.00 miles of sewers, and 609.34 miles of water mains. Two municipal theatres, in which free entertainments are given, were established in 1922. The national headquarters of the American Legion have been established in Indianapolis, and an impressive World War Memorial has been constructed by the city, Marion County, and the State of Indiana. The base of the building, which is constructed of Indiana limestone, is 180 feet square; and the tower, which rises to a height of 230 feet, is 50 feet square. The building and Memorial Plaza, covering five city blocks, will represent, when completed, an expenditure of more than \$10,000,000. A municipal airport has been established on a 1000-acre field seven miles from the city.

The number of industrial establishments in Indianapolis increased from 886 in 1914, employing 31,791 persons and making products valued at \$39,700,016, to 1215 in 1922, employing 56,000 persons and making products valued at \$427,100,000; the capital investment rose from \$87,569,251 to \$220,250,000. In 1928 Indianapolis had 850 industries that produced more than 1200 different commodities, the leading ones being automobiles, slaughtering and meat packing, metal trades and machine shops, automobile accessories, wearing apparel, canning, printing and publishing, and grain and cereal products. These industries employed 45,752 persons who received approximately \$74,000,000 in wages. The value of products manufactured in 1928 was \$435,000,000. The resources of 4 National, 24 State, and 13 trust-company banks in 1928 were \$293,017,222, and the total assets of 58 building and loan associations were \$99,680,167. Approximately 10 per cent of the membership in building and loan associations in the United States is listed in Indianapolis, and approximately 40 per cent of the families own their own homes. Building construction in Indianapolis grew from \$7,933,081 in 1914 to \$23,669,315 in 1928. During 1928, 4200 permits were issued for new buildings at a cost of \$23,669,315. The assessed valuation of property in Indianapolis in 1928 was \$672,689,970; the net debt was \$31,419,575.

**INDIANA UNIVERSITY.** An institution for the higher education of men and women at Bloomington, founded in 1820. In 1928 it had the following divisions: College of arts and sciences, graduate school; law; commerce and finance; music; education; medicine; dentistry; nurses' training; and social service. During the period 1914 to 1928-29, the attendance increased from 2620 to 4233; the faculty from 155 members at Bloomington and 50 at Indianapolis in 1923, to 299 in 1928; the volumes in the library

from 99,760 to 197,700; and the income from \$396,216 to \$2,000,000 from State and private sources, the endowment amounting to \$774,778 in the latter year. A new commerce building costing \$235,000 was finished in 1923, and a stadium with a seating capacity of 22,000 was completed in 1924. Other new buildings ready or under construction in 1924 were a men's dormitory with a capacity of 115; a women's dormitory with a capacity of 250; James Whitcomb Riley Memorial Hospital (Indianapolis), dedicated. A new wing of the library was begun in 1925 and additional appropriations were given for library equipment in both 1926 and 1927. In the latter year, the Legislature appropriated a mill tax that was expected to yield \$350,000 per year, for 10 years, to be used exclusively for the construction of new buildings and the purchase of land. In October, 1928, a new home for the Nurses' Training School, costing \$500,000, the gift of Ball Brothers, of Muncie, Ind., was dedicated. In 1925 by act of the legislature, Indiana Dental College was purchased for the University and the four-year dental course was changed to a five-year course to take effect in the ensuing year. President, since 1902, William Lowe Bryan, Ph.D., LL.D.

**INDIAN PROBLEM.** See KENYA COLONY; SOUTH AFRICA, UNION OF.

**INDIANS (UNITED STATES).** The Indian population seems to have increased in the period since 1914. According to the U. S. Bureau of Indian Affairs, the number of Indians was 331,250 in 1914 and 354,940 in 1927, a gain of 23,690. For certain intervening years, their numbers were: 1921, 340,838; 1922, 340,917; 1923, 344,303; 1924, 346,902. The difficulty with accepting these figures on their face is that part of the increase may be due to the inclusion of large numbers of mixed-bloods with increasingly small proportions of Indian blood, and to the notorious inexactness of Indian census records. Part of the increase is undoubtedly real, due to improved health conditions resulting especially in fewer infant deaths. The U. S. Census of 1910, available in 1915, gives 265,083 in the United States and 25,331 in Alaska. While it may be possible that "Indians" in the census sense (i.e., those having an appreciable amount of Indian blood) are increasing, it is obvious that there has been no general increase in the number of full-bloods.

The current figures may be contrasted with estimates of the population at the time of exploration. There is a high degree of probability in the figures given by J. Mooney (*Aboriginal Population of America North of Mexico*, 1928) as follows: United States proper, 849,000; British America, 221,000; Alaska, 73,000; Greenland, 10,000; total, 1,153,000. Of these, the greatest number were in California (200,000), the Plains (141,800), and Gulf States (114,400). Kroeber estimates a smaller number for California (133,000), but agrees that its density was greatest (*Indians of California*, 1925). Mooney's estimate is smaller than that of K. Sapper (*XXI Int. Congr. Amer.*, The Hague, 95). Of a total of forty to fifty million for both Americas, there were in North America north of the limits of cultivation, one-half million; to the Mexican boundary, two to three million; Mexico, twelve to fifteen million; Central America, five to six million; West Indies, three to four million; tropical Andes, twelve to fifteen million; tropical East South America, two or three million; and in tem-

perate South America, one or two million. For aboriginal life, see ETNOGRAPHY.

The present distribution is very unequal, Indians residing principally in the Western States. Those having largest populations in 1926 were in their order; Oklahoma, 120,487; Arizona, 44,729; South Dakota, 24,676; New Mexico, 22,527; California, 18,913.

Hybridization is in progress among the Indians. The proportions of full-blooded and mixed-blooded Indians were established with accuracy for the first time in the U. S. Census of 1910, prepared under the direction of a competent anthropologist, R. B. Dixon (*Indian Population of the United States and Alaska*, 1915).

	United States		Alaska	
	Number	Per cent	Number	Per cent
Full-blooded	150,058	56.5	21,444	84.7
Mixed-blooded	93,423	35.2	3,887	15.3
Not reported	22,207	8.3	....	...

Those of mixed blood were predominantly Indian-white (including Mexicans); mixtures with Negroes were only 1.5 per cent of the total. In five adjoining States (New Mexico, Utah, Arizona, Colorado, and Nevada), comprising the interior arid plateau, and in Iowa and Mississippi, the proportion of full-bloods was more than 85 per cent. In California, Idaho, South Dakota, and Wyoming, the proportion was more than 70 per cent; in Louisiana, Montana, Nebraska, Oregon, and Washington, more than 55 per cent. Oklahoma, which contained one-third of all Indians, had only 36.6 per cent of full-blooded. Principal tribes with the highest percentages of full tribal blood were; Hopi (Arizona), 99.3 per cent; Navajo (Arizona-New Mexico-Utah), 99.0 per cent; Zuni (New Mexico), 98.4 per cent; Papago (Arizona), 95.8 per cent; Pima (Arizona), 95.3 per cent; Laguna (New Mexico), 94.8 per cent; Ute (Colorado-Utah), 93.0 per cent; Mohave (Arizona-California), 91.3 per cent; Arapaho (Oklahoma-Wyoming), 89.4 per cent. These figures are an index of the extent to which tribal solidarity has been preserved. All of these tribes, excepting Arapaho, live in relative isolation from white settlements. These data for 1910 are probably representative of conditions in 1928, except that the percentage of mixed-bloods may be slightly greater.

Several studies of inheritance of physical traits among mixed-bloods have recently been made. Jenk's *Indian-White Amalgamation* (1916) showed that among descendants of Ojibwa and French-Scotch, breadth of face and head varied between the ancestral extremes according to the preponderance of one strain or the other. A more extensive study was Sullivan's *Anthropometry of the Siouan Tribes* (1920). It appeared here also that there was a tendency among the offspring to inherit the wide face of the Indian or the narrow face of the white parent, but not to form an intermediate type. Narrow heads and narrow faces tended to be inherited together. In characters such as skin, hair, and eye color, and in hair form, the half-bloods approached Indians more closely than whites. Half-bloods were taller than full-bloods. These confirm earlier observations of the same nature by Boas.

Fecundity and vitality among Indians are related to the percentage of mixed blood in the parents. The percentage of sterile women in the total is 8.6; in full-blood marriages, 10.7; in mixed marriages, 6.7. Sterility further decreases in direct proportion to the amount of

mixed blood. Mixed marriages also show a greater fertility, although the proportion of mixed blood does not affect the result; average number of children in all marriages, 4.8; in full-blood, 4.5; in mixed marriages 5.1. Vitality is also greater among children of mixed marriages: per cent of children surviving in all marriages, 74.7; in full-blood, 69.7; in mixed marriages, 79.0. The vitality of the children increased proportionately to the white blood of the parents. It is not clear whether this relative superiority of mixed unions is due to social or racial conditions.

A measure of changing social conditions among Indians appears in the records of school attendance and illiteracy. School attendance is obviously related to the facilities provided. The number of school children in 1910, in 389 schools, was 31,930; in 1900 (329), 26,771; in 1890 (246), 16,377. This varied with tribes from Hopi, 79.3 per cent of children in school, to Navajo, 8.9 per cent. Illiteracy among Indians was 45.3 per cent in 1910, compared with 7.7 per cent for the entire United States. It has decreased, however, from 1900 (56.2 per cent). This varied with tribes from Navajo (95 per cent males, 84 per cent females) and Zuni (95 per cent males, 60 per cent females) to Chickasaw (21 per cent males, 6 per cent females). The Hopi and Zuni are Pueblo peoples concentrated in a few fixed villages; the Navajo, a widely scattered desert people; the Chickasaw live on terms of equality with the Oklahoma whites.

Social conditions vary enormously among the Indians, from that of the Five Civilized Nations of Oklahoma and the Indians of New York State, whose status is substantially that of whites, to the Indians of Arizona, Nevada, and Utah, where their existence in remote districts is still on a primitive level. Hence, their problems and those of the Bureau of Indian Affairs, charged with their protection and development, are highly variable. The general policy of the Government is to fit them as rapidly as possible for complete amalgamation with white communities, gradually withdrawing from the capacity of guardian. Progress has been much slower than was anticipated, partly owing to the handicap of poverty and ill-health of the Indians, partly to their isolation in many instances, and partly to the ineptitude and vacillating policy of the Indian Bureau. A large part of the gain made by Indians in 1914-28 is indirectly due to the rapid expansion of automobile roads in the West opening up the more inaccessible districts.

For some years, the policy of the Bureau has been to declare individual Indians competent to manage their own affairs as rapidly as possible, rather than wait for whole tribes to reach this status. In 1917 the Bureau declared for including all having one-half white blood or more in this group, but in 1921 the Commissioner of Indian Affairs annulled this blanket policy as unworkable. The Bureau had also for some years been contracting with the States to include Indian children in public schools. This had the advantage of hastening their induction into white communities and relieving the Federal Government of many administrative costs. In 1927 the number of children so placed was about thirty-four thousand. The Bureau was aware that its health programme had not kept pace with progress elsewhere, due to financial neglect of the service and the high turnover of underpaid workers. Coöperation was arranged with the U. S.

Public Health Service and State boards, which materially improved the situation. The Bureau had also requested extension of existing Federal and State laws to include minor crimes committed on reservations and which did not fall under Federal statutes. These had previously fallen in the jurisdiction of reservation courts, whose authority was meagre and punishments mild.

The Indian's legal status and property rights were brought sharply into public focus by the introduction in Congress of the Pueblo Land Bill. This provided that white claimants to Pueblo Indian lands and water rights in New Mexico should be recognized without regard to the rights of the Indians and that should the Indians thus be deprived of sufficient land to support themselves, they were to be removed to other lands. The outburst of public sentiment was such that the bill was withdrawn.

About the same time, the Commissioner of Indian Affairs issued a proscription against all Indian dances (which have both social and religious significance). The demands for the prohibition came largely from religious organizations, although Indians and their advocates maintained that this was a punitive act for having blocked the Pueblo Land Bill. The previous policy of the Bureau had been not to interfere with native ceremonies, except with respect to unlawful practices, which were rare. Thus, the question of religious freedom was raised. Opposition spread rapidly to white citizens, as well, and several associations for their assistance were organized, notably the Indian Defense Society. Public opinion forced the Commissioner to recede from his position. See also G. E. F. Lindquist, *The Red Man in the United States* (1923).

These two acts had the salutary effect of re-arousing public interest in the Indian. For the first time, the general public became aware of the wretched condition of these people. Knowing only by repute of the great wealth of a single tribe, the Osages, derived from oil-land royalties, the popular impression had been that Indians generally were well-to-do. The organizations friendly to the Indians soon remedied that misapprehension and the public conscience demanded a new policy on the part of the Indian Bureau.

An outgrowth of this agitation was the investigation of the condition of the Indians and *The Problem of Indian Administration* (1928), by the Institute for Government Research, at the request of Secretary Work. While this report was primarily concerned with the Indian Bureau, it is a mine of information on the present status of its wards.

The conditions it reported were shocking. Indians are miserably poor. While other resources vary from one reservation to another, it may be noted that their cash income per capita per year is under five hundred dollars (Carson, \$15 to Colville, \$418), except for Klamath, \$1523, and Osage, \$19,119. Per-capita earned incomes vary from \$8 to \$351 per annum. The concomitant of this poverty is disease. The tubercular are estimated at one in ten. Deaths from it are 6.3 per 1000, as compared with 0.87 for the general population. Trachoma, which causes blindness, is widespread and venereal disease rife. Infant mortality is high: deaths of children under one year constitute 26.2 per cent of all deaths; of those under three years, 36.9 per cent (compared with 13.6 per cent and 16.2

per cent in the general population). The total death rate is abnormally high, 25.6 per 1000, as compared with the general 16.2. The highest Indian death rate (39.2) is in Nevada. Hospitals, sanatoria, and the like, maintained for them are insufficient in personnel, equipment, management, and design. Boarding schools are not only overcrowded, but the children are undernourished, routinized, made to labor for the maintenance of the school, taught subjects unrelated to their life, and turned back on reservations without aid in establishing themselves. The per diem for food in these schools is eleven cents, totally inadequate to feed them. Legal protection is inadequate, although much of the best work has been done by the Indian Service in this field. Indians are despoiled of their holdings by designing individuals. Others are ignorant of the value of land placed in their hands by patent, and dispose of it to their own harm. There is hardly a phase of Indian life in which they are not below the standards of even the poorest whites. This is not a fault of their own creation, but is due to the encroachments of whites and the lack of any broad and sustained plan on the part of the Indian Bureau.

On the basis of their report, the Institute for Government Research made recommendations to improve conditions among the Indians and increase the effectiveness of the Indian Bureau. "The fundamental requirement is that the task of the Indian Service be recognized as primarily educational . . . devoting its main energies to the social and economic advancement of the Indians, so that they may be absorbed" or be fitted to live "at least in accordance with a minimum standard of health and decency." It is recognized that this cannot be achieved without a material increase in the Congressional appropriation. To use this effectively, a Division of Planning and Development should be created, the expert members of which should be able to advise the Bureau, prepare programmes of local development, and check the effectiveness with which they are carried out. Recognizing that local problems are highly variable, they recommend a maximum decentralization in planning and supervising the Bureau's activities.

Among the immediate improvements, health conditions stand first, since these effect not only the Indians but the whole population. Public health clinics are recommended, extensions of hospital service, periodic examination of children, and material improvement of the children's diet. Educational improvements are possible by a programme better suited to the children's needs and by raising the qualifications of teachers. Routinization in the schools, which destroys individual initiative, should be abolished. Similarly, much of the labor of the pupils for school-maintenance, condoned as giving industrial training, should be done away with. Provision should be made for after-school placement in order that the pupils may not revert to reservation conditions. Economic conditions can be improved by creating opportunities for remunerative work; withholding fees from unearned incomes as conducive to pauperism. Improvement in the homes is possible by a more adequate home-demonstration and public-health service. A check on exploitation can be had by legal services more in the Indian's interest, and by preventing the sale of inherited lands which leaves the Indians landless. The most drastic criticism of the Indian Service is on the ground

of the inadequate training and personality of its local staffs, which are also insufficient in numbers to serve its purpose. It is recognized that this is the result of unattractive salaries. Accordingly, higher salaries are recommended, which are to be paid, however, only for more adequately prepared individuals.

Immediate action is recommended to feed the generally undernourished school children; then to proceed in turn with the Division of Planning, improving the present personnel and equipment, the health and economic programmes, and obtaining new specialists for the purpose. While a general estimate of additional appropriations is not made, it appears that more than seven millions a year will be needed over a period of five to ten years. The current appropriation (1928) is \$14,991,485, including \$2,151,800 from tribal funds. This addition would create an efficient organization, the upkeep of which would diminish year by year as the Indians merge into the general population.

Late in 1928, a senatorial committee began hearings on the Indian question in California. The 1928 platform of the Republican Party favored a commission to inquire into any infringements of the rights of Indians. It remains to be seen if anything comes of this. See RACE PROBLEMS; EUGENICS; ANTHROPOLOGY; ETHNOGRAPHY.

**INDIA RUBBER.** See RUBBER.

**INDUSTRIAL ARBITRATION AND CONCILIATION.** See LABOR ARBITRATION.

**INDUSTRIAL CHEMISTRY.** See CHEMISTRY, APPLIED.

**INDUSTRIAL DEMOCRACY.** During and immediately after the World War, various programmes were considered, and some adopted, for the purpose of giving the workers a greater share in the management of industry. None of these had a real success though some of them did, for a time, stabilize working conditions in a number of industries. Theoretically, the concept of industrial democracy aimed at the introduction of democratic principles in industry and the control of the means of production by the producers, i.e., the workers. What was to be, in short, was a form of syndicalism. Expression was to be given to the idea through the organization of workers' committees in the shops not only for the purpose of exercising control but to perfect profit-sharing devices. In Great Britain and Germany, some organizations were set up; in the United States, the only thing to emerge was a paper plan (the so-called Plumb Plan) which soon dropped out of sight.

In Great Britain, under war conditions, shop stewards, as they were called, assumed leadership in many factories and represented their fellow-workers in discussions concerning hours, wages, and shop conditions. The movement was syndicalist in character and had as its real aim the setting up of control by the workers, and because the shop stewards were largely to be found in the engineering trades (which were so vital in the production of munitions), they played very important rôles. With the end of the War, however, the shop-steward movement declined and trade unionism once more assumed its leadership of the working-class movement. The same was the fate of the Whitley Councils which first appeared in Great Britain in 1918 as the result of a governmental committee investigation. This body recommended joint standing industrial councils as the means for adjusting relations be-



tween employers and employees. There were to be in the system district councils and work committees, as well as national councils. During 1918-20, these councils spread and, at the end of the two years, there were 72 councils and 11 interim reconstruction committees; but the idea never took hold in the important industries and the council languished, as trade unions, freed from war restrictions, once more gained control.

The fact is, in Great Britain and Germany, too, where the working populations were organized on political lines, it was recognized that the present industrial situation of private ownership partook more or less of the nature of a truce. The trade-union position was this: the State, increasingly, was to be used as an instrument in giving the worker security against unemployment, sickness, and old age; it was sooner or later to take over the key industries; and trade unionism was the only weapon of the worker in the protection of working conditions. In the individual shop, everything was in favor of management; hence, the individual worker had to have back of him the organized effort of the whole working class and not merely that handful with whom he had an affinity of interest through propinquity. English industrialists were realists and showed that they appreciated the situation when, as a result of the efforts of Lord Melchett, the English Conference on Industrial Relations (1928) insisted upon the recognition of trade unionism and sought to maintain peace in industry not through the so-called democratization of industry but by treating with trade unionism as a component element in the situation.

In 1920 Germany provided for the creation of works councils in all establishments where 20 or more persons were employed. The functions of the councils were: to cooperate with employers to increase efficiency; to promote industrial peace and adjust grievances; to supervise the adjustment of awards affecting employees and agree on working rules; to promote safety and good health; and to cooperate in the administration of welfare programmes. For a brief time, the councils functioned. During the inflation period (ending November, 1923), they helped in the stabilization of wages; but, with deflation and the resulting unemployment, the position of the trade unions was seriously weakened and the works councils were shorn of most of their power. In 1925 the trade unions had recovered and works councils began to reappear in larger establishments. In smaller plants, they continued to disappear and, in ordinary commercial establishments, they were practically nonexistent. The works councils have largely acted to enforce trade agreements made by the unions with the employers and to protect workers against unjust dismissals. The system has fallen very far short of its expectations when its advocates said it was going to give the workers a share in the control of management.

In the United States, immediately after the War, much attention was given to the Plumb Plan, whose purpose was the setting up of a system of workers' control among the railways. This plan, named after its author Glenn E. Plumb, who was the general counsel for the railway brotherhoods in the United States, proposed government purchase of the railways and the creation of a national railways operating corporation, the board of directors of which was to

consist of 15 members, five chosen by the workers, five by the officials of the railways, and five by the Government. The Interstate Commerce Commission was to fix rates and wages were to be fixed by a wage board. Profits were to be divided between the Government and the corporation. The railroad brotherhoods sponsored the plan and succeeded in gaining the endorsement of it by the American Federation of Labor at the conventions of 1920 and 1921, but nothing came of the plan.

Another scheme that received attention was the Baltimore & Ohio plan for the union-management cooperation in the running of the railway shops of the system. The plan was first inaugurated in 1923 and by 1929 was in operation in the 45 shops of the Baltimore & Ohio, as well as on the Canadian National Railways, the Chicago & North Western, and the Chicago, Milwaukee & St. Paul. The essentials of the Baltimore & Ohio plan were as follows: Each shop is organized as a unit. Trade unions are recognized, and management and the unions are to develop written agreements governing wages, working conditions, adjustment of disputes, etc. There is to be cooperation between management and the unions for the purpose of increasing efficiency and the elimination of waste. The workers, on the other hand, are to be assured that employment will be stabilized. In other words, for greater efficiency, the worker is promised security in employment, better working conditions "and sharing in the gains of cooperation."

**INDUSTRIAL EDUCATION.** See EDUCATION IN THE UNITED STATES.

#### INDUSTRIAL WORKERS OF THE

**WORLD.** A labor organization founded in Chicago in 1905, by a group of radicals who were discontented with the conservative policies of the trade unions. It was based on industrial unionism as opposed to the craft unionism of the American Federation of Labor, and in this sense it was a form of syndicalism. It drew its strength largely from the unskilled and migratory labor of the West, that is to say, the men from the logging and railroad-construction camps and those who followed the harvesting season from the South to the North. It worked with some degree of success among dockworkers and seamen. During the period of the War and immediately afterwards, the organization was prominently identified with a series of important strikes in the West. It was associated with the disorders in Bisbee, Ariz. (1917), as a result of which a large group of workers was deported into the State of New Mexico; its leaders were charged with interfering with the prosecution of the War and in 1918, 95 of them were tried and found guilty of conspiracy. They were sentenced to serve twenty-year jail terms and pay fines of \$20,000. I. W. W. leaders were charged with having fired on a parade of veterans in Centralia, Wash., Nov. 11, 1919, and a round-up of I. W. W. members resulted. In the years immediately after the War, a number of the Western States dealt harshly with the movement and made membership in it a criminal offense. Notably, California and Washington led in these prosecutions.

After 1924, the movement declined and by the close of the period surveyed (1928), the I. W. W. had passed from the industrial and political scene. Its decline may be attributed to the following reasons: the defection of its leader, William D. Haywood, who deserted his fellow

prisoners and fled to Russia while out on bail; the internal strife that had been part of the movement since the Russian Revolution; an attempt on the part of some to make the I. W. W. less revolutionary and more scientific by carrying on surveys in key industries, etc.; official persecutions in the West; the falling out with the Red International. This last probably was the chief reason for the disappearance of the movement. The success of the Russian Revolution had seized the imagination of the radicals in the country and they became convinced that the methods of Communism and affiliation with the Communist international at Moscow (a thing which I. W. W. leadership had steadily refused to do) were more likely to produce success than the more intellectual methods of the I. W. W. After 1924, therefore, the Workers' Party supplanted the I. W. W. as the radical organization in the United States.

**INFANTILE PARALYSIS.** In 1921 a new serum treatment for this disease was announced by Dr. Rosenow of the Mayo Foundation, and artificial sera have been tested extensively, but despite many favorable results published the tendency at present is to depend on the use of natural convalescent serum when this can be obtained. The possibility of the recurrence of the epidemic incidence of the disease as witnessed in 1907 and 1916 has caused this malady to take on renewed interest with the lapse of time. An intensive campaign, chiefly of education, was planned in 1929 by a body of practitioners and research men and funds have been supplied for the collection and preservation of convalescent serum. The details have not yet been worked out but the movement has been sponsored by the Rockefeller Institute and the campaign proposed is international in scope, with Dr. W. H. Park as chairman. Reports in which the early use of serum treatment has appeared to cause a great sparing of life and function have recently been published, but credit is given almost entirely to convalescent serum and it does not appear that manufactured sera can duplicate results from the latter. It is so difficult not only to make a correct early diagnosis and institute treatment at the proper time, but also to make certain of a large supply of convalescent serum that too much must not be hoped for should the disease appear in wholesale incidence.

**INFANTRY.** See **ARMIES AND ARMY ORGANIZATION; STRATEGY AND TACTICS.**

**INFLATION.** See **FINANCE AND BANKING.**

**INFLUENZA.** The pandemic of 1918 wrote a new and significant chapter in the history of this contagious disease. Up to that period, it had been regarded commonly as an air-borne affection, proof against isolation and quarantine; its spread by personal contact is now acknowledged by health authorities. Before the pandemic, influenza had been generally viewed as a relatively harmless but very annoying malady, dangerous chiefly to weaklings and through occasional complications. When influenza is deadly, it is because of the complication of pneumonia, and so prevalent was this complication in the pandemic that some clinicians came to regard the disease as essentially pneumonic, although under ordinary circumstances this feature is quite latent or suppressed. The custom of keeping the influenza patient in bed for a week, despite the insignificance of the symptoms, is due very largely to the belief that every case of influenza is a potential pneumonia and that the latter is

apt to assert itself if the patient is up and about. Of great importance is the relationship between pandemic influenza and ordinary seasonal winter grippé. The latter in most localities has been regarded as a legacy of the older pandemic of 1890, although winter grippé is known to have existed in certain localities, Minnesota, for example, long before that year. There are notable differences in epidemicity, for while winter grippé, as the term implies, is an affection peculiar to cold weather, true influenza appears just as readily in the spring, summer, and autumn as in winter. Winter grippé is not highly contagious, although in cold months there are better opportunities for the spread of a disease. In regard to the bacterial cause of winter grippé, four or five separate germs have been accused at different times, notably Pfeiffer's bacillus, the pneumococcus, streptococcus, micrococcus catarrhalis, etc. That is, each of these organisms seems capable at times of setting up a relatively benign epidemic catarrh without any special tendency to dangerous complications.

In pandemic influenza, none of the above organisms can be associated with the contagion of the disease, although its deadliness is due to the special virulence of the pneumo- and streptococcus, responsible for the peculiar type of fatal pneumonia so often seen. To explain the pandemic, we must invoke the existence of a highly diffusible contagious principle which in addition to smiting the great majority of those exposed further lowers the resistance to the ordinary ubiquitous disease-bearing germs, so that under the circumstances these acquire unusual virulence. The pandemic of 1918 lasted from May of that year to May, 1919. During this period, there were at least three distinct waves. The first, which occurred in late spring and early summer, was distinctly mild. The second wave, in late summer and early fall, was very severe, decidedly malignant. The third wave, in the winter of 1919, also was malignant, masking the ordinary seasonal grippé. Hence, judging from analogy, the virulence of the disease, at first mild, gathered force during the second and third outbreaks, as a result of continuous passage through human bodies. This law of increasing virulence is familiar in experimental and clinical pathology.

Did the pandemic of 1918 originate in Spain? There is no evidence to support this belief. Influenza was common in fighting troops during 1917; in the United States Army alone, more than 40,000 men were attacked, both at home and in France. Influenza of decidedly virulent type was seen again in March, 1918, in widely different parts of the world—America, France, and the Far East. The disease gradually gathered force and chanced to break out in Spain during May on a huge scale. The weight of evidence favors the belief that the scattered episodes in the United States early in 1918 played a major rôle in causing the European outbreak through the crowding of our soldiers at this period. We know that contagious diseases flourish when foreign troops are moved about. Influenza was often likened to the plague in deadliness, but this result is apparent only. Influenza may attack nearly every one, but the death rate does not usually exceed 2 per cent of those attacked; those attacked by pneumonia may have a death rate of 40 per cent. Plague pneumonia attacks relatively few, but with a mortality almost or quite 100 per cent. Since the pandemic, there has

been only a regular succession of outbreaks of seasonal grippé, varying in severity.

**INGE, Inj, THE VERY REV. WILLIAM RALPH** (1860- ). A British prelate and man of letters (see Vol. XII), dean of St. Paul's (London) since 1911. He was Commander of the Royal Victorian Order, Fellow of the British Academy, Honorary Fellow of Jesus and King's Colleges, Cambridge, and of Hertford College Oxford, Gifford lecturer (1917-18), and Romanes and Hilbert lecturer (1920), Rede lecturer (1922), and Hulsean lecturer (1926). In the front rank of contemporary British essayists, he is known, on account of his vigorous criticism of certain modern tendencies, as "the gloomy dean." His later writings were: *Types of Christian Saintliness* (1915); *The Philosophy of Plotinus* (1918); *Outspoken Essays* (1919), 2d series, (1922); *The Idea of Progress* (1920); *The Victorian Age* (1922); *Personal Religion and the Life of Devotion* (1924); *The Platonic Tradition* (1926); *England* (in Modern World Series, 1926); *Lay Thoughts of a Dean* (1926); *The Church in the World* (1927); and *Labels and Libels* (1929).

**INGELBRECHT, D. E.** (1880- ). A French composer and conductor, born in Paris. After his graduation from the Conservatoire he began to attract attention through his interpretation of impressionistic works, especially those of Debussy. In 1908 he became conductor at the Théâtre des Arts, and four years later went to the Théâtre des Champs Élysées. In 1925 he was appointed musical director of the Opéra Comique. A close personal friend of Debussy, he espoused the cause of impressionism also in his compositions. He wrote a ballet-opera, *Le Diable dans le Beffroi* (Paris, 1927); a symphonic poem, *Pour le Jour de la première Neige au vieux Japon*; *Le Cantique des Créatures de Saint François d'Assise*, for chorus and orchestra; *Rapsodie de Printemps, Automne et Trois Poèmes dansés*, for orchestra; *El Greco, évocations symphoniques*; a quintet for strings and harp; chamber music, piano pieces and several collections of songs. He also orchestrated a number of piano works of Couperin and Albeniz.

**INGLIS, ALEXANDER JAMES** (1879-1924). An educator and author of educational books; born at Middletown, Conn., and educated at Wesleyan University (Conn.). He became assistant professor of education in 1914, and in 1919, professor of education at Harvard University. During the World War and later, he was engaged as expert in important educational investigations and surveys for both the Federal and State governments. Besides textbooks for Latin courses, he wrote *Rise of the High School in Massachusetts* (1911); *Principles of Secondary Education* (1918); *Virginia Public Schools* (1919); *Intelligence Quotient Values* (1921); and *The Inglis Tests of English Vocabulary* (1924; rev. ed., 1927). He also edited a series of books on the theory and practice of education.

**INHERITANCE TAX.** See TAXATION IN THE UNITED STATES.

**INJUNCTION.** When Congress in 1914 passed the Clayton Act, greatly restricting the use of injunctions in labor disputes, its action was hailed by labor as an important victory in its long fight to curtail the use of injunctions. In the years immediately following, encouragement also was given to labor in State legislation. In 1917 an interesting tendency was disclosed in the Northwest to free strikes from

injunctions and at the same time to punish violence severely. Minnesota forbade the issuance of injunctions in trade disputes except to prevent irreparable injury to property and prohibited their issuance to prevent termination of employment. The act does not curtail the power of the courts if irreparable injury to business or property is threatened by violence or unlawful acts or acts involving criminal syndicalism. Utah passed a law similar to the Minnesota act, adding that injunctions must not interfere with "peaceful persuading." In 1919 legislation was passed in Iowa, North Dakota, Oregon, Washington, and Wisconsin to limit the use of injunctions. Nevertheless, the courts, both Federal and State, continued to issue injunctions in labor disputes in ever increasing numbers and in terms more and more strict.

While is it the established law in the United States that laborers may under no circumstance be enjoined from quitting work, still in some injunctions "conspiring to quit" was enjoined. The courts resorted generally to the conspiracy theory in issuing injunctions against acts not in themselves unlawful in labor disputes. In some notable injunctions, union officers were prohibited from advising or ordering workmen to go on strike or from paying strike benefits. A notable injunction of this type which aroused widespread interest was secured by the Federal Government during the bituminous coal-mine dispute of 1919.

More injunctions were issued in connection with labor disputes in 1922 than in any previous year. At least twice as many were issued by the Federal courts in this year as in the entire 10 years preceding. Included among the 1922 injunctions was a judicial order which prevented the officers of the Brotherhood of Railway Station Employees from calling a strike sanctioned by a referendum vote. Another was a judicial order, subsequently materially modified by a higher court, which enjoined the United Mine Workers from attempting to unionize a West Virginia coal district. But overshadowing all others was the injunction which the Attorney General of the United States secured from a Federal judge in Chicago against the railway-shop crafts. This injunction, which aroused a storm of public discussion, was so broad that it practically forbade the strikers from doing anything, peaceful or otherwise, toward winning the strike. The use of injunctions in labor disputes, which labor maintains is an abuse, was increasing to such an extent that by 1924 it had become a political issue of considerable importance.

The platform of the independent candidate, Senator Robert M. LaFollette, declared vigorously in favor of abolishing the use of injunctions in labor disputes, although the Republican and Democratic party platforms ignored the issue until 1928. Meanwhile, several States adopted minor regulations and Illinois and New Jersey passed so-called anti-injunction laws. Congress, in 1926, abolished the railroad labor board and repealed the Act of 1913 providing for arbitration of disputes between railroads and their employees and established therefor machinery for settlement of disputes which fail of adjustment by usual means of conference. The 70th Congress had before it for consideration the Shipstead Anti-injunction Bill. Extensive public hearings were held on this measure and the sub-committee

prepared an elaborate substitute bill which was referred back to the full committee but no further action was taken.

Important among recent court decisions is that handed down by the United States Supreme Court (Apr. 11, 1927) in the case of Bedford Cut Stone Company vs. Journeymen Stone Cutters' Association, as a result of which it must be regarded as settled law that all strikes against the use of non-union material are unlawful, and that, in most cases, the anti-trust laws can be invoked against them. More encouraging to labor is the case of Interborough Rapid Transit Co. vs. Lavin, et al., 247 N. Y. 65, upholding the right of a union representative to solicit membership among workers belonging to a company union and parties to a "yellow dog," or individual, contract.

**INMAN, SAMUEL GUY** (1877- ). A clergyman and writer on South American topics, born at Trinity, Texas, and educated at Columbia University. He engaged in educational and missionary work in Mexico in 1906, and after 1915 was secretary of the Committee on Cooperation in Latin America. He wrote *Christian Cooperation in Latin America* (1917); *Interpretation in Mexico* (1919); *Through Santo Domingo and Haiti* (1919); *South America Today* (1921); *Problems in Pan-Americanism* (1921); *Ventures in Inter-American Friendship* (1925); and other works on Latin America. He founded and directed the monthly magazine, *La Nueva Democracia*.

**INSANITY.** Insanity, to judge from reports of various localities since 1914, has been increasing more rapidly in the United States than the population, and the housing shortage cannot explain the overcrowding of institutions and the use of property intended for other purposes to shelter the insane. Kretschmer has shown that the individual who develops precocious dementia and he who becomes a victim of manic-melancholic insanity have opposite types of mind and physique. All men, in other words, have schizoid or cycloid characters. Others have taken up this teaching with modifications, notably Bleuler and Jung, and a large literature on temperament and character has sprung up.

True progress in the direction of the actual cure of forms of insanity generally regarded as beyond aid, including congenital mental defect, is naturally slow and uncertain; but within the past few years, progress has developed where most unexpected. The cure of paresis—a sequela of syphilis hitherto regarded as not only incurable but rapidly fatal—through inoculation with blood from a malaria patient, as originated by the Vienna alienist Wagner von Jauregg, has resulted in the cure of 30 per cent of all cases treated. Very recently, Doctors Lovenhart and Lorenz have devised a method which as yet has not been fully made public for rousing patients from katatonic stupor, a condition common to the endogenous insanities of youth. This method involves the use of an inhalant vapor and its details have not yet been sufficiently perfected for general discussion. While the actual gain is slight, it is possible that a new era is foreshadowed for the control of certain insanities. Another step forward seems to have been made by Dr. W. Timme in the improvement obtained by him after 10 years of experiment on children with Mongoloid idiocy, a condition hitherto regarded as hopeless. These results have been accomplished by the use of inter-

nal secretions and in a number of patients the mental condition passed from idiocy to a much higher intellectual plane.

**INSECTS AND INSECT CONTROL.** See ENTOMOLOGY ECONOMIC; and FORESTRY.

**INSTALLMENT SELLING.** What is known as installment selling, since 1914 has assumed a place of great importance in the American system of business practices and management. It has recently been estimated that of a total of about \$40,000,000,000 of merchandise annually sold at retail, probably \$8,000,000,000, to \$9,000,000,000, is annually marketed in this way. It is an undoubted fact that the adoption of this method of selling has greatly increased the volume of sales, and consequently in many cases, the rate of turnover and profits enjoyed by the enterprises which have adopted it. Accordingly, the new system of selling has made rapid progress, and has, of recent years, spread outside of the United States and into several European countries besides gaining a foothold in the Orient.

**Definition and scope.** By installment selling is meant, as the term indicates, the transfer of goods from seller to buyer, without full payment, either on the spot, or within a designated period, but instead, upon the basis of a limited cash payment made at the time of taking possession, followed by a series of cash payments at indicated periods, until the whole purchase price is liquidated. Prior to the adoption of the installment plan, prevailing methods of sale included chiefly transfers of goods for cash, transfers for signed obligations, such as notes or acceptances, and transfers on open account based, therefore, upon the buyer's general credit, and usually limited by the practice of the trade to such periods as 30, 60, or 90 days, according to custom. It is true that in a few lines of business, such as the sale of sewing machines, agricultural implements, and the like, a practice of allowing payments to be made at so much per week or month over long periods had been established. These were usually founded upon investigation of the income-earning power of the buyer, and were sometimes accompanied by liens upon wages, so that the payments really became an anticipation of wages. In a few instances, the buyer of such commodities signed an agreement to surrender the article in the event of default of any installment, even though the article might be very nearly paid for. Purchase of real estate was also generally made on a partial-payment system.

**Origin.** The installment plan is thus not new in conception, but is new in application and in the working out of its technique. Its growth in recent years has been largely due to two factors: (1) The increasing ability of manufacturers to cut unit costs by mass production, provided they could obtain a wide distribution, and (2) the increasing number of high-priced mechanisms which might be brought within the reach of a consuming public, liberally paid and generally employed, provided that that public could be induced to save for the purpose of buying a desired object. To these two factors might be added the increasing flexibility and ingenuity in the use of credit-extension devices which has resulted in the creation of numerous enterprises, designed to "carry" or finance obligations made by those who purchase on the installment plan.

The types of installment-plan selling vary somewhat, but may be classified under a few

main heads. (1) There still exists a considerable body of goods, in which delivery is made without the signature of any documents or execution of any obligations, but merely with the oral agreement on the part of the buyer to remit at stated intervals, usually monthly, until the entire purchase price is settled. (2) A more common variation of this plan is found in the execution by the buyer of a bill of sale of the commodity in favor of the seller, so that the latter is in a position to recover possession of the article at any time he sees fit, usually in the event of default on any installment. (3) A still further variation is afforded by the practice of requiring of the buyer the signature of a series of notes representing the amount of his various installments, while these notes are themselves secured by the bill of sale of the commodity or a chattel mortgage thereon. (4) In some cases, the buyer signs a qualified form of agreement in which he undertakes to make payment, but with the understanding that he may at any time discontinue the payments and turn in the article in its condition as then existing.

**Study of Credit Fundamental.** It is evident that the successful working of this plan implies rather careful scrutiny of credit on the part of those who make the sales. Accordingly, it generally necessitates a selling mechanism, in which actual sales are made and credit tested by a local representative or dealer. This representative or dealer may grant the credit on behalf of the producer of the article, or in other cases, he may be called upon to pay cash to the producer, and then grant the credit on his own responsibility. In the former case, the producing concern, if it succeeds in obtaining a large distribution, evidently has a very widely diffused body of assets, and a very complex problem of collection. In the latter case, its continued sales depend upon the prosperity of the local dealers, and upon their success in maintaining their sales upon a high level. This in turn necessitates provision of means whereby the dealers may succeed in disposing of, or "financing" the paper which they receive from their customers. The latter necessity has resulted in the organization of a large number of "financing companies," "acceptance corporations," and other enterprises of a similar character. In these concerns, a definite form of financing is arranged in behalf of the dealers who are selling given kinds of commodities to the public. These dealers are encouraged to sell to them the acceptances or notes growing out of their transactions (with or without their own indorsements as the case may be) and the company then undertakes to "finance" them. It has various ways of accomplishing this object. One way is to put in the hands of a trust company, the notes, chattel mortgages, etc. growing out of the operations of the dealers, and then to issue against these its own collateral notes which are sold to investors or banks. Such a buyer of these collateral notes then has as security: (1) the signature or obligation of the buyer of the commodity, (2) a mortgage upon the object which he has bought and is using, coupled with insurance thereon, (3) the endorsement or guarantee of the dealer to whom the note was originally given by the buyer, (4) the obligation, in many cases, of the acceptance or finance corporation which has purchased the paper and is reselling it to the investor.

**System Tested by Soundness of Paper.** It is evident that the general effect of the install-

ment finance system must eventually depend upon the character of this paper and the extent to which the credit system is soundly based. While there has been much talk of the "moral" effect of the installment system, of its alleged incitement to extravagance, etc., a careful analysis of the situation largely eliminates these fictitious elements in the discussion. Those who are disposed to be extravagant in one way are likely to be extravagant in another and vice versa, so that the question whether the credit has been soundly issued and used, appears to be in the last analysis the final test of the desirability of the procedure employed. Unfortunately, thus far, experience has not been long enough to afford a positive conclusion on this subject. Losses have been comparatively small. They have however been large enough to indicate where the danger lies.

This danger may be described somewhat as follows: Inasmuch as the sale of goods on the installment plan is practically nothing more than the anticipation of future income, or rather the appropriation of future income to specified objects, the real question clearly is whether there is a probability that future incomes will continue. The reply made by advocates of the installment-sale system is that, with a very wide distribution of sales, it may be expected that future income will be undisturbed. To this, the response is naturally made that while that may be true as a general assertion, the probability, or at least possibility, of periodically recurring business depressions renders it always within the bounds of reason that there may be a general condition of unemployment, in which case it is highly improbable that installment payments could be generally maintained. Further, since the security of the seller in cases of non-payment is found in the recovery of the object sold, and its resale at second hand, such sales would be likely to reach their peak at a time when public demand was smallest. The result might easily be that enterprises whose capital is very thinly spread out, in carrying industries financed on the installment-sales plan, would be unable to protect themselves against loss, and would be left with great numbers of half-used and half-worn goods as their only means of protection. In the case of articles which are to be regarded as semi-luxuries, rather than necessities, such for example as automobiles, this criticism applies with substantial force. On the other hand, in those industries which turn out goods not of very standard quality, or which lose a large fraction of their market value through a short period of use, such for example as clothing, furs, and the like, the possible protection to be obtained from recovery of the goods and resale is likely to be a small and unsatisfactory one. There is, therefore, a large possibility of failure in these lines whenever a great quantity of goods has been placed on the installment plan, followed by a period of relatively slack employment and poor collections.

**Banks and Installment Selling.** The danger arising out of installment selling on the credit side has been most pronounced when the installment paper was purchased by banks, and was by them used as the basis for protecting obligations supposed to have been founded upon liquid credit. Exactly how much installment paper is now held by banks is a matter of dispute, and there is no way of definitely determining it. The figure, however, has been set as \$2,500,000,000



or \$3,000,000,000, and these figures do not seem to be overestimates. Installment paper has figured in an important way in a good many bank failures, and has also been complained of, although without adequate or final proof, as an influential if not a decisive factor in enlarging the number of commercial failures, which has risen to unprecedentedly high figures of recent years.

There is thus no warrant for the assertion made by some economists that installment credit is a new discovery, or has the effect of such a discovery, inasmuch as it is a means of financing or providing for consumption. There has always been a disposition on the part of lenders to finance consumption whenever that could be safely done, and the point at issue has been whether the credit so granted could be protected in such wise as to render it reasonably liquid and sound. Modern installment selling does not present any new phase of the situation, in theory, but merely affords a slightly new technique, modified by the fact that through mass production and consumption, a much larger field of purchase and sale has been built up than has ever before been rendered available.

**Cost of System.** It also should be remembered that the effect of installment selling is to add very materially to the cost of goods. This addition is conservatively estimated at the present time at from 18 to 25 per cent. The cost of distributing goods is increased by that amount, and the consumer's ability to pay is correspondingly reduced, since so large a part of his resources is diverted into the bearing of excessive financial expense. The question, therefore is often raised whether the alleged advantages of installment selling to the consumer and the apparent advantages enjoyed by the seller, in consequence of greater turnover and larger volume of sales, are not in the long run more than offset by the reduction of the consumers' actual buying power, resulting from the extraordinary expense involved in the various safeguards necessitated by the process of disposing of goods through the installment plan. The question also is naturally raised, whether, when the consuming community shall have committed itself fully in the purchase of goods, with respect to future income, the assumed advantages in enlargement of business, believed to have existed during the early period of installment sales will not come to an end. In other words, serious doubt is felt whether the installment plan may not have very definite limits as a business builder, so that after the lapse of a moderate period of time, its capacity as a means of expanding sales may be exhausted. Opinion is undoubtedly swinging to the view that this in fact will be the outcome to be expected, so that as a result the installment method of disposing of goods will have proven merely a temporary expedient in enlarging the volume of sales. It remains true, no doubt, that in certain kinds of industry, installment selling would continue to be regarded as partially necessary because of the indisposition of consumers to save continuously for the purpose of making a single large cash expenditure for the purchase of some desired object.

As an economic device, therefore, installment selling still occupies a somewhat dubious position, with many arguments presented both for and against it, and, as already stated, the eventual decision probably dependent upon the outcome as to its effect upon credit, when this effect

shall have been thoroughly tested as a result of business recession or depression.

**Bibliography.** A large literature of fugitive character, much of it controversial, has developed with reference to the subject of installment selling. An elaborate study of installment selling will be found in the two-volume work, *The Economics of Installment Selling* (New York, 1929), prepared under the direction of Prof. E. R. A. Seligman, of Columbia University, at the request of the General Motors Acceptance Corporation. This work also contains an extensive bibliography.

**INSTINCT.** As used in psychology, the term indicates an inherited psychophysical disposition on the part of the organism which serves as a determinant of activity. As defined by McDougall, an instinct is purposive in character; that is, it goes out to accomplish a definite biological end. It is, therefore, distinct from the motor mechanism, which serves simply as a means for the accomplishment of the biological purpose. Under such a definition, there naturally would be as many instincts as there are specific hereditary purposes.

In McDougall's *Outline of Psychology* (1923) is given a list of 14 major instincts and a half-dozen minor instinctive responses so mechanical in their nature that they are not accompanied by any display of emotion. The list, including synonyms, is as follows: instinct of escape (of self-preservation, of avoidance; danger instinct); combat (aggression, pugnacity); repulsion (repugnance); parental (protective); pairing (mating, reproduction, sexual); curiosity (inquiry, discovery, investigation); submission (self-abasement); assertion (self-display); social or gregarious instinct; food seeking (hunting); acquisition (hoarding instinct); construction; laughter. Around these major instincts are grouped the corresponding primary emotions (such as fear, anger, disgust, etc.) and in this way, a certain air of system is given to the treatment of the affective life which is lacking in most other psychological textbooks.

In addition to these specific dispositions of the mind, McDougall postulates nonspecific tendencies and faculties. Included among these are intelligence, defined as "the capacity to improve on native tendency in the light of past experience," sympathy, etc. It is evident that the nonspecific dispositions serve as the link to bind up the isolated instinctive responses into the unified activity of the organism much as the general staff of an army directs the movements of the specific arms and branches.

Professor McDougall first formulated his general theory of instincts in 1908, in his classic *Social Psychology*. At that time, the only rival conception was that of Thorndike, who in his *Educational Psychology* conceived the instinct as a chain of reflexes, a very complicated chain of reflexes, but withal a mechanical system. Professor McDougall says of an instinct that "when brought into play, it generates an impulse, an urge, or a desire for some change in the situation that evoked it, an impulse which keeps the organism uneasy, restless, striving in this way and that so long as it is not inhibited by a stronger impulse or satisfied by the attainment of its natural goal, the changed situation of a specific kind." To Professor Thorndike, on the other hand, such a view smacks of "magic potency." He prefers to describe the operation of a particular instinct as a series of situations

and responses. These responses, because they are determined, are predictable in the same way that the reactions of chemical elements are predictable. No room is left for potentialities, for changes in fundamental reactions, or for profiting by experiences in the way that Professor McDougall allows. The Thorndike conception nevertheless has for its advantage, or for what may be claimed as an advantage, its scientific disinterestedness from morality, purpose, and value. McDougall's conception is a difficult one to employ in a scientific scheme modeled on a positivistic or rather a materialistic interpretation of physics and chemistry. It is a conception that fits in better with a practical system of moral conduct, preferably of the conservative sort.

Strange to say, the violent polemical discussions of the problem of instincts during the decade and a half following the publication of the *Social Psychology* were never able to get beyond the popular antithesis of mechanistic science and practical morality. On the mechanistic side, positions have been put forward even more radical than those of Professor Thorndike. Among these might be cited as typical the point of view of Z. Y. Kuo. Refusing to accept even the Thorndike conception of instinct as an integrated series or reflexes, he would explain all human activity on the basis of nonspecific "units of reaction." "The reaction units are what we find in the child's spontaneous activities and random acts. . . . Such spontaneous and random acts are all that we can credit to the native endowment of man. These are nonspecific instincts, for they are reflexes in character and involve few, if any, complex neural patterns."

In his emphasis on reflexes, Mr. Kuo was following the lead of Watson and the Behavioristic movement, but even Professor Watson assumed that, beyond the mere random reflexes, there exists a group of innate reactions, or instincts.

F. W. Allport (*Social Psychology*, 1924) may be said to occupy an intermediate position between the extremes represented by McDougall and Kuo, in which he substitutes the concept of groups of reflexes for instincts. Upon this concept, he builds a unique social psychology. (See R. S. Woodworth, "Social Psychology: A Review," *Journal of Abnormal and Social Psychology*, 1925, for a criticism of Allport's work.)

The notion that there exists any fixed entity as an acquisitive instinct naturally irritated those who had hoped to find in social psychology a support for their radical views on social progress, and at the same time it seemed to lend "scientific" color to the eternal necessity of a capitalistic order. The instinct of pugnacity, if taken with the same seriousness as the laws of mechanics, automatically condemns pacifism. Many similar difficulties arise in connection with the other instinctive concepts. For a long time, sociologists and social psychologists were in turmoil over the question whether there really existed any such instinct as the instinct for imitation, around which the French psychologist, Gabriel Tarde, had built up by a *tour de force* the entire scheme of social movement. And great was the relief when both Thorndike and McDougall legislated this instinct out of existence, McDougall preferring to explain the phenomena of imitation by the concourse of intelligence with the specific instincts.

Addressing the American Psychological Association in December, 1916, Prof. John Dewey

hailed the work of McDougall and Thorndike, between whose theories he drew no distinction, as laying the basis of a new social science. "Henceforth," he said, "our social psychology is placed on the sure ground of observation of instinctive behavior." Scarcely two years later in his Princeton lectures of 1918, published in book form under the title *Human Nature and Conduct* (1921), he expressly repudiated McDougall's theory in the interest of his own belief of social radicalism and did not see fit to adopt the Thorndike conception of reflexes. The view which he did elaborate, while admitting the probable existence of instinctive roots for human conduct, tried to explain this conduct on the basis of a succession of impulses and habits. The instinctive part of our habits, he appeared to maintain, does not come into being until the habits are formed under the stress of environment. In this manner, he avoided committing himself to McDougall's fixed classification of instincts, which had been the subject of much attack, without offering any other classification. The artifice of placing the chapter on instinct after the chapter on habit is open to criticism, inasmuch as, in mechanistically determined systems, potentialities are treated as fixed quantities long before they pass into the active state. The beauty of physical science lies in the fact that potential energy may be measured just as accurately as it is possible to measure kinetic energy, or energy in motion.

Almost any philosophy of instincts tends to undermine the prestige of the intellect and intelligence. A theory of mechanical reflexes tends of course to abolish intelligence altogether; but, under the conception of fixed instincts, the intelligence is reduced to the rôle of a helpless mediator between the imperious inborn tendencies of human nature. The notion of the sublimation of instincts, which has been so extensively used by the psychoanalysts and psychopathologists, consecrates anti-intellectualism into a dogma. It might be said that the metaphor of sublimation was invented in order that it might be misinterpreted. At any rate, it owes its popularity to the ease with which it lends itself to distortion. When the highest intellectual achievements of humanity are defined as mere sublimations of primitive instincts, it is only a short step in the popular mind to de-throning these achievements altogether and preferring "self-expression" via the so-called instinctive urges. In this respect, the genius of modern social psychology works directly opposite to the genius of dogmatic religion, which, while adopting an almost identical hierarchical division of human nature into instincts and faculties, regards the instincts as the domain of the devil and "sublimations" as the striving for divine perfection.

To sum up the present situation in the doctrine of instincts, we should say that there exist two dogmatic positions—the theory of specific instincts and the theory of mechanical reflexes. Of these two, the instinct theory is the more flexible and could be converted at will into a dogmatism for morality or into a dogmatism against good morals. Perhaps the larger number of present-day psychologists might be regarded as skeptics, vacillating between the acceptance of teleological instincts and the apparently more scientific concept of reflexes.

Philosophically speaking, the theory of teleological instincts and the notion of reflexes both

can be conciliated into the scheme of science if we throw out, on the one hand, the prejudice of purpose and, on the other, the prejudice of mechanical predeterminism. Neither of these has a place in a descriptive science. The instinct becomes the larger unit and for that reason harder to measure; the reflex is the smaller unit and more accurately determined, but it is too small for social computation. It is as if we were to try to formulate the principle of the pulley in terms of electronic vibrations. While the notion of purpose and inner striving is thus excluded from descriptive psychology, it need by no means be banished from the world of thought as a delusion and a fraud. It finds its place in those disciplines which aim to cultivate inner development: art; religion; the philosophy of religion. It is not necessary for the science of man to be religious in order to cooperate with the religious striving, just as it is not necessary for the science of physiology to be healthy in order to further the interests of health.

**Bibliography.** Consult: W. McDougall, *Outline of Psychology* (1923); E. Thorndike, *Educational Psychology*, 3d ed. (1913); C. Josey, *The Social Philosophy of Instinct* (1922); John Dewey, *Human Nature and Conduct* (1921); W. H. Rivers, *Instinct and the Unconscious* (1920); James Drever, *Instinct in Man* (1917). Periodical discussions may be found in *The Psychological Review*, *Journal of Philosophy*, and *The Journal of Abnormal Psychology and Social Psychology*, beginning with the year 1920. For a simple presentation of the various aspects of the instinct controversy, consult A. I. Gates, *Elementary Psychology* (1925).

**INSTITUTE OF INTERNATIONAL EDUCATION.** See UNIVERSITIES AND COLLEGES.

**INSULIN.** On account of the powerful action of this drug on the diabetic, it has been tested in a great variety of pathological states and some favorable reports have been published which will require further corroboration before they can be finally endorsed. Next to diabetes, the condition which seems most amenable to its action is emaciation in certain forms and there have been numerous miscellaneous reports of weight gain following a course of injections. Further experience has shown that insulin is no general anti-lean remedy and in all probability the field of its usefulness in this direction is a relatively narrow one. Attempts to give insulin and alleged substitutes by the mouth, thus dispensing with the hypodermic method, give results which are not very convincing, but the subject is still open. Since insulin is an impure mixture, many attempts have been made to isolate it in the pure state and in 1925 Abel and Geiling reported the first attempts to obtain an exact substance which might be synthesized, possibly with a great reduction of cost, for at present the supply of the drug is far from adequate to meet the needs of many thousand diabetics. In 1926 Abel announced that he had obtained insulin in crystalline form, but further information has been lacking. See also DIABETES; DIET; FOOD AND NUTRITION; SECRETIONS, INTERNAL; also SURGERY (insulin in shock).

**INSURANCE.** Since insurance, although an independent business activity, is a financial tool for the furtherance of the more fundamental economic processes, its development may be expected to follow closely the outstanding developments in those processes. The history of the business after 1912 illustrates this tendency.

Its volume increased with the rise in prices and the extension of general business activity. New forms of coverage were originated and old forms adjusted to changes in the need for protection. Within the insurance business, there was considerable activity in the organization of new companies and in the forming of groups of companies under a single management particularly in the property insurance field, where individual insurance interests aimed to offer as wide a variety of coverages as practicable. An important feature which for a time was most far-reaching in its influence on insurance, was the World War with its effects on prices of securities and property. During the World War and immediately following it, the Insurance Commissioners permitted insurance companies to adjust the valuation of their investments on the basis largely of intrinsic worth and thus avoid in some measure the unfortunate effects of market fluctuation. The increase in prices brought about a corresponding increase in the amount of insurance required to cover the risk of loss of property and of other values. The War also had a marked effect on the moral hazard; it tended, in general, to decrease the losses of insurance companies where property was covered whose loss would result in the cessation of large profits to business men. After the War, however, when a period of adverse conditions in business followed deflation, the preservation of property was less a matter of concern to its owners; consequently, there was an increase in insurance losses, which must also be attributed, in large measure, to the moral hazard which was in evidence for six years.

Governmental regulation of insurance steadily increased its scope and effectiveness. The National Convention of Insurance Commissioners, succeeded in offsetting in some degree the disadvantages of regulation by the individual States through its efforts toward uniformity in supervision and in laws; but much remained to be accomplished in this direction. After the recovery from deflation, the rise in market values of securities resulted in large profits to insurance companies other than life-insurance companies, and their stock advanced greatly in price. The public began buying insurance-company stocks eagerly with the result that they became widely distributed. Many established companies increased their capital and, especially in 1927 and 1928, organization of new companies on a large scale became active.

A feature of the period following the War was the increased interest in insurance education. Many institutions of higher learning added insurance courses to their curricula and various organizations of insurance men provided instruction for those engaged in the business.

**Life Insurance.** On Dec. 31, 1928, 311 legal reserve life-insurance companies had insurance in force amounting to \$93,888,281,725, as compared with \$50,290,710,180 in force in 286 companies at the end of 1922 and \$27,189,009,697 in force in 241 companies at the end of 1917. Thus, the increase in 11 years was 245 per cent. These figures are taken from the *Insurance Year Book*. A careful estimate made by the Association of Life Insurance Presidents placed the total amount of legal reserve life insurance in force at the end of 1928 at approximately \$95,000,000,000. By July 31, 1929, it was estimated that the total insurance in force had reached \$100,122,085,000. To meet their obligations as they become due,

these companies had admitted assets of \$15,947,095,594 at the end of 1928, as compared with \$8,652,318,490 in 1922 and \$5,940,622,780 in 1917. The amount of new legal reserve life insurance written and paid for increased from \$4,891,037,043 in 1917 to \$9,774,271,118 in 1922 and to \$17,135,458,992 in 1927, an increase of 299 per cent in 11 years.

Among the principal reasons for this increase in new business are the inflation of prices, necessitating the purchase of more insurance to provide a given standard of living to dependents; increased ability of policy holders to pay premiums; the discovery of new uses for the application of life insurance to both personal and business affairs, and a remarkable improvement in the selection and training of life-insurance salesmen. Except during the period of the influenza epidemic in 1918-1919, the general tendency of mortality has been downward. It has long been recognized that the American Experience Table of Mortality, on which the premium rates of American life insurance companies are largely based, is no longer accurate, as it indicates a considerably higher mortality rate, especially among younger lives, than the insurance companies are actually experiencing. The American Men Table of Mortality, reflecting more recent experience, has been worked out by eminent actuaries, and the State of Connecticut has authorized its use in computing rates and reserves, but other States will have to amend their laws before its use can become general. By reason of the fact that the actual mortality has been much more favorable than that indicated by the American Experience Table and the further fact that the rate of interest earned by life insurance companies since the War has been much in excess of that assumed when their premium rates were made, companies issuing participating policies have been able to make very liberal returns in dividends to policyholders and nonparticipating companies have been able to reduce their premium rates.

There has been a remarkable development of group insurance since it was introduced in 1911. While originally designed to insure employees under one policy, the premium on which was paid by the employer, the premiums on a vast amount of the group insurance more recently written are paid jointly by employer and employees, and group policies are now written covering members of societies, labor unions, and other organizations. As this insurance is written without medical examination and members of groups who are advanced in years are admitted, the system has extended the benefits of life insurance to great numbers of persons who otherwise would have been denied them. According to the *Insurance Year Book*, 2895 group policies for insurance aggregating \$1,910,939,193 were written in 1928 and at the end of that year 17,158 policies amounting to \$8,034,289,884 were in force.

More group insurance was written in 1928 than in any previous year, and a careful estimate placed the total amount of insurance in force at the end of that year at approximately \$8,000,000,000 on the lives of 6,000,000 persons. The figures given in reports published in 1929 by the Bureau of the Census of the U. S. Department of Commerce represent only member companies of the Association of Life Insurance Presidents, of which there are 44, comprising approximately 82 per cent of the life insurance in force, but these same companies handle an

equally large percentage of the group insurance.

The following table shows the number (A) and value (B) of group certificates issued 1913 to 1928 inclusive:

	A.	B.
1913	30,001	\$ 20,828,000
1914	49,083	45,474,000
1915	78,507	47,122,000
1916	140,870	78,720,000
1917	309,118	178,336,000
1918	315,196	246,656,000
1919	476,635	425,574,000
1920	461,894	425,787,000
1921	123,589	111,083,000
1922	256,124	274,616,000
1923	418,162	520,045,000
1924	358,994	597,765,000
1925	546,391	998,784,000
1926	752,280	1,050,605,000
1927	500,992	824,372,000
1928	599,453	1,336,328,000

Another important development in life insurance in the past few years has been the adoption by a number of companies of the practice of issuing policies for limited amounts on the lives of persons who have not been subjected to medical examination but have been recommended as fit by experienced agents in whom the companies have special confidence. Several companies have reported satisfactory experience under these policies and increased the limits.

The safeguarding of funds paid to beneficiaries under life-insurance policies has had much attention and within a few years the "life-insurance trust" has taken a prominent place. Many trust companies and leading life-insurance agents have coöperated in presenting to persons carrying large amounts of life insurance the advantages of making their life insurance payable to a trust company to be paid by it to the beneficiaries in such manner as the assured provides in the deed of trust.

**Fire Insurance.** Increase in the amount of property insured and increase in property values in terms of money resulted in an increase in the fire insurance in force in companies reporting to the New York Insurance Department from \$78,396,546,465 on Dec. 31, 1917, to \$121,552,779,774 on Dec. 31, 1922, and to \$177,145,140,742 on Dec. 31, 1928. Fire premiums written by these companies increased from \$454,135,118 in 1917 to \$635,542,309 in 1922 and \$769,869,664 in 1928. The fire losses paid by the same companies were \$209,895,691 in 1917, \$345,951,143 in 1922 and \$338,857,706 in 1928. Meanwhile, the admitted assets of these companies, had increased from \$896,728,088 on Dec. 31, 1917 to \$2,654,496,211 on Dec. 31, 1928. Their combined capital and surplus, however, increased in a greater ratio, rising from \$360,244,623 on Dec. 31, 1917, to \$1,076,643,548 10 years later, and to \$1,361,535,514 on Dec. 31, 1928. The period of the War and about three years following were very profitable as fire losses were low, moral hazard being almost entirely absent; but when deflation came, serious moral hazard developed, fire losses rose to a high point, and insurance companies suffered an underwriting loss. These conditions ceased only late in 1926.

In 1927 the losses decreased and in 1928 they were even lower than in 1927. The fire losses of the United States and Canada as compiled by the *Journal of Commerce*, of New York (those of the United States separately not being available), during this period were as follows: In 1917, \$267,273,140; in 1918, \$317,014,385; in

1919, \$269,000,775; in 1920, \$330,856,625; in 1921, \$332,654,950; in 1922, \$410,889,350; in 1923, \$389,192,200; in 1924, \$377,529,250; in 1925, \$373,500,550; in 1926, \$393,020,000; in 1927, \$320,595,600, and in 1928, \$301,267,580. While fire-insurance companies suffered a loss on underwriting from 1921 to 1926 inclusive, their earnings from investments were large, as securities rose in value and interest rates were good, and these earnings were the chief factor in increasing surplus although a large amount of capital has been invested in companies at a premium since the War.

One of the most remarkable developments in American fire insurance has been the affiliation of companies in groups, thus enabling one staff of officials and one office organization to serve a number of companies. But few companies of prominence are now without these affiliations. This system has been extended until many fire-insurance companies now also have casualty and surety companies affiliated with them. Recent years have witnessed unusual activity in the purchase of stock of fire-insurance companies by the general public. The various organizations working for the reduction of fire loss in the United States have been active and have made their efforts more effective.

**Marine Insurance.** For the year 1918, the total net premiums received for marine insurance within the United States were estimated at slightly less than \$110,000,000 by Dr. S. S. Huebner. The *Insurance Year Book* reports \$39,396,354 ocean marine premiums for 1922 and \$46,419,760 for 1928. Ocean shipping during the War was subject to new hazards, partly due to enemy activities, and developed a very large volume of war-risk insurance to cover the hazards not covered by ordinary ocean marine policies. The extent and even the nature of these hazards were unpredictable, and they could be assumed by insurance companies only to a limited extent. Governmental bureaus were established in the United States and in other countries to insure shippers against losses from war hazards. Without such aid, shipping by private interests would have been, in large part, necessarily discontinued. Increased activity in foreign commerce during and after the War led to the organization of many new marine-insurance companies and to the development of marine insurance by older companies. After a period of feverish activity, many of the new organizations disappeared. When international trade became depressed, the volume of available business was greatly reduced and the large number of insurance companies seeking it entered into fierce competition. Policy forms were broadened and inadequate rates were charged, resulting in severe underwriting losses. Through the efforts of leading companies, especially in Europe, conditions have been improved somewhat but they are still far from satisfactory. In 1919 Congress became concerned with the preponderance of alien interests in the marine-insurance business. An investigation was made, as a result of which a model marine-insurance law, designed for the encouragement of American marine insurance, was adopted for the District of Columbia. With the cooperation of the companies and of Congress, three syndicates were organized for the purpose of increasing marine-insurance facilities, largely in the interest of American carriers. Recently, New York and Pennsylvania have enacted laws to tax marine

insurance on the basis of profits and not of premiums written, thus lightening the burdens on American companies.

Inland marine insurance has been developing somewhat rapidly, the premiums, according to the *Insurance Year Book*, being \$23,644,089 for 1922 and \$39,688,160 for 1927, with only moderate losses.

**Miscellaneous Insurance.** Under this classification may be grouped the various kinds of insurance and bonds written by casualty and surety companies, the principal classes being accident and health, automobile, workmen's-compensation, liability, burglary and robbery, plate glass, steam boiler and machinery breakdown, credit and live-stock insurance, and the numerous classes of fidelity and surety bonds. Miscellaneous insurance has made a very large growth in a relatively short time, due largely to the enactment of workmen's-compensation laws and the great increase in the number of automobiles, making the driving of cars more hazardous and necessitating liability insurance for the protection of their owners against loss due to claims for personal injuries to others. According to the *New York Insurance Report*, in which are included the statements of most of the leading companies writing miscellaneous insurance, the premiums written by these companies in 1917 amounted to \$221,804,779, in 1922 to \$415,783,884, and in 1928 to \$759,146,160. The admitted assets of these companies increased from \$282,678,822 at the end of 1917 to \$629,301,966 at the end of 1922 and to \$1,289,751,253 at the end of 1928. There was considerable activity during the decade in organizing new companies, especially institutions to write automobile insurance.

See FIRE PROTECTION, OLD-AGE PENSIONS, SOCIAL INSURANCE, and WORKMEN'S COMPENSATION. **INTELLIGENCE TESTS.** See EDUCATION IN THE UNITED STATES; MENTAL MEASUREMENT. **INTERALLIED DEBTS.** See REPARATIONS; and FINANCE AND BANKING.

**INTERMEDIATE CREDIT BANKS.** See AGRICULTURAL CREDIT.

## INTERNAL-COMBUSTION ENGINES.

Engines in which fuel is introduced into the cylinder and power is obtained by the resulting combustion of fuel and air make up 80 per cent of the total number of engines of all kinds in use in the United States. Each of the twenty million automobiles, the thousands of farm tractors, the innumerable motor boats, and many ocean-going vessels employ internal-combustion engines, making up a total of approximately 750,000,000 horse power. In fact, the average person is more familiar with the gasoline motor than he is with other forms of power.

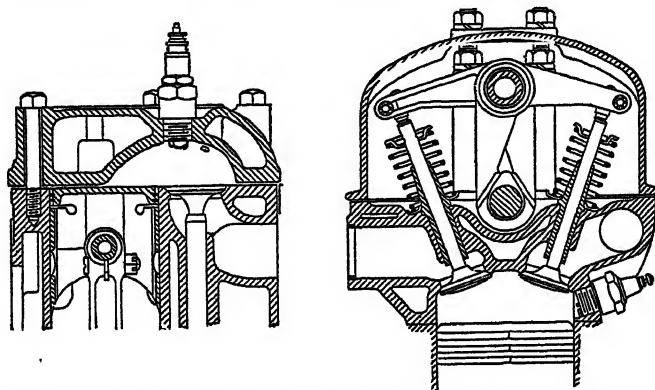
The advent of the automobile brought with it a demand for engines of light weight, 5 to 10 pounds per horse power, and of extremely favorable balance. Consequently, for all save cheap farm units, the gasoline engine is built with cylinders placed vertically and ranging in number from 4 to 16, with a few having cylinders set in V style. Engine speeds vary, depending upon the service, from 60 to 3000 revolutions per minute. A modern automobile engine appears in the illustration. It will be observed that the most obvious characteristic is compactness, closely followed by that of accessibility. See MOTOR VEHICLES.

The present tendency is toward the en-bloc design, in which all the cylinders and the upper



part of the crank case is in one casting. This reduces the machining operations and also reduces the engine length without sacrificing the cylinder water-cooling space. Pistons are made mostly of cast iron, but for the better class of automobiles, especially when the engine has a high rate of revolution, the pistons are made of aluminum. Connecting rods are usually steel castings, although a few cars use steel drop forgings; in high-speed engines, duralumin rods are being used. Bearings are either babbit shells set into recesses in the frame and connecting rods or, in the cheaper engines, the babbit is cast into the recesses and is then reamed or

The increase of engine speed involved more than merely reducing the unbalance of the engine's reciprocating parts. As a mixture of fuel and air does not ignite instantaneously, there is always a lag between the appearance of a spark at the spark plug and the creation of a gas pressure in the cylinder. One of the best methods of increasing or accelerating combustion in automotive engines is by designs of cylinder heads to produce combustion chambers that will promote turbulence. A violent turbulence means a more thorough mixing of the liquid particles and the air stream, and engines employing this principle give better combustion, though in



FORMS OF AUTOMOTIVE ENGINE COMBUSTION CHAMBERS AND TYPICAL VALVE PLACING

At left: Head with side valve head and combustion chamber to promote turbulence. At right: Overhead valves to permit quick charging and exhaust of gases.

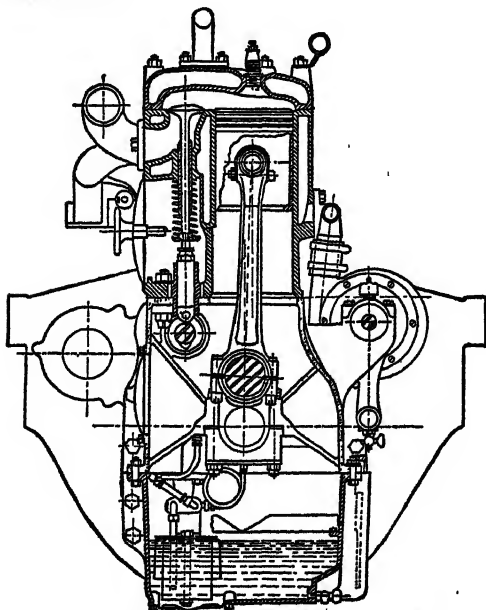
broached to size. Crank shafts are universally forgings of high-carbon steel. As there are always secondary forces to produce vibrations unless the cranks are balanced, the better grade of automobile engines has balance weights on the cranks. A few engines make use of dampeners to reduce the torsional vibration of the crank shaft.

some cases they do not permit of as heavy charges being inspired, because of the throttling effect of the passages through which the gas must pass in reaching the cylinder interior on the suction stroke.

For this reason, there is a return to the *L* design of cylinder head in which the valves are placed in at one side of the head, but instead of a narrow passage combining the valves and the cylinder space, the combustion cavity is shifted from the cylinder proper and is massed into a dome space over the valves. Ricardo is credited with the origination of this idea. Few of the modern engines use the overhead valves and plain combustion chamber, for the Ricardo design proved to be more efficient and permits carrying higher compressions without pre-ignition or "early spontaneous ignition."

Automobile engines, save those of the most modern design, compress the fuel-air mixture to a pressure of 90 pounds per square inch. As the efficiency  $E$  of the Otto cycle engine is expressed by the equation:

$$E = \frac{T_1 - T_2}{T_1}, \text{ when } T_1 \text{ is the absolute temperature at the end of the compression stroke and } T_2 \text{ the temperature of the charge at the beginning of the compression stroke, it is apparent that increasing } T_1 \text{ would increase the efficiency, or in other words, increase the horse power produced per gallon of fuel. The temperature of } T_2 \text{ depends upon the final compression pressure and the endeavor has been to raise this pressure from 90 pounds. The usual gasoline, however, will explode spontaneously if the compression is raised much beyond 90 pounds, save in extremely}$$



CROSS-SECTION OF AUTOMOBILE ENGINE

high-speed engines where the time interval is small. Consequently, scientists have spent much time in evolving a fuel that is free from pre-ignition and detonation. The addition of a small amount of tetraethyl lead to gasoline is said to permit of using twice the accepted compression pressure without pre-ignition and "knocking."

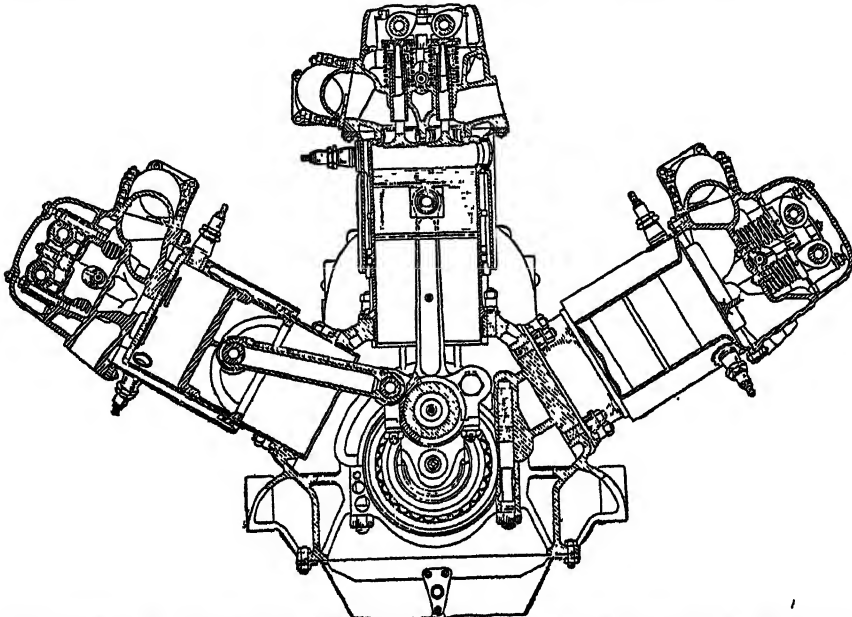
Others have found that special cylinder-head designs will permit higher compression, while still others use a small amount of benzol with the gasoline. Today, many automobile engines are using compressions ranging from 120 to 150 pounds, although this higher pressure will produce "knocks" if the engine is run at slow speed on a rich mixture, as when climbing a hill, which mixture ignites rapidly. On a lean mixture, such as exists when idling, the high-compression engines work satisfactorily.

**Aviation Engines.** The rapidity with which aviation has developed since the World War has taxed the ingenuity of the engineer in producing a satisfactory gasoline engine of high efficiency, light weight, and inherent reliability. The first aviation engine was a heavy two-cylinder opposed-cylinder type unit, which was quickly succeeded by engines with 6, 8, and 12 cylinders placed in line. During the World War, in order to produce a plane having high speed and lightness, engines were brought out with cylinders placed in either two or three rows, having the appearance of a V engine with an extra row of cylinders placed vertically, as shown in one of the illustrations.

different makes were used. Certainly the weight of the engine and accessories is naturally low.

In both these types, the number of cylinders range from three to nine when but a single row is used and up to 18 in double-row machines. It is necessary to have an odd number of cylinders in a row if a single crank is used, which is customary. The firing order will follow the direction of rotation in a radial engine with fixed cylinders and will be in the opposite direction in rotary-cylinder machines. In all cases, alternate cylinders are skipped in the firing order, so that it takes two complete revolutions of the cylinder assembly for all cylinders to fire.

The advantage of the rotary engine is first that air cooling is possible, thereby reducing the weight by 40 per cent. The length of the engine is much decreased, giving greater space in the fuselage. In addition, it is easier to mount and to dismantle. On the other hand, the overall diameter is greater, which necessitates the widening of the plane body. It uses more lubricating oil, for much drips into the cylinders from the crank. In large sizes, there is a considerable gyroscopic action, which is a hindrance in maneuvering, for the engine resists the change in direction of its plane of rotation. The fuel consumption also is greater than with the fixed-cylinder engine. The advantages, however, outweigh these several objections. Such engines are being built up to 300 horse power in single row units and 600 horse power in double-row designs. Where powers go over



ARRANGEMENT OF CYLINDERS IN AVIATION ENGINE TO SECURE COMPACTNESS OF DESIGN IN MULTIPLE CYLINDER FORMS

All of these engines employed water cooling and as the demand was for lightness, designers produced both rotary- and radial-cylinder engines that depend upon air cooling. While the "in-line" engine is still being built, the tendency is toward the universal acceptance of the rotary and radial engine, with the latter predominating. In the majority of recent long-distance flights, the radial engines of several

300 horse power, it is possible that the V type engine or the X type, such as the Packard, is better.

In 1929 the radial engine is the general favorite and has thrust the rotary type into the background.

Originally, automobile practice was followed and all cylinders and pistons were of cast iron. Improvements in materials, as well as in design,

took place during and after the War. Pistons are now made of aluminum, and the cylinder is generally a mild-steel tubing. The jacket for water cooling is formed by welding thin aluminum or steel sheets to the tubing. The upper end of the tube is threaded and the aluminum cylinder head is screwed on to the tube. With aluminum heads, the valve seats are steel rings placed in the mold when the aluminum is poured. As the exhaust-gas temperatures are high, ranging from 900 to 1800° F., cast-iron valves will not suffice. Modern engines employ valves of tungsten steel or chromium steel. Connecting rods are duralumin castings and the crank shaft is of high-carbon steel. Usually, the shaft is made from a single forging, but in the rotary engines, the crank is built up of three pieces to permit disassembling.

Aviation engines operating at other than low altitudes require a highly volatile gasoline that will vaporize at a lower temperature than will commercial gasoline. The carburetion of gasoline is difficult in an aviation engine for the reason that the ratio of fuel to air will vary with the altitude, so that at high altitudes the engine may cease firing although the gasoline lines are clear and the carburetor is in working order. The rate of flow of gasoline through the carburetor jet is dependent on the pressure drop between the atmosphere and the intake manifold. Even if the mixture is perfect at ground level, it may fall off at high altitudes; if the air density becomes one-half, the fuel feed drops probably 75 per cent. See AERONAUTICS.

**Superchargers.** Superchargers are especially valuable on air craft operating at high altitudes. As the engine reaches altitudes where the air is lighter, the weight of the charge decreases and the power is correspondingly reduced. This loss of power is stated to be very great in engines not equipped with superchargers. A Liberty airplane engine that will develop 400 horse power at sea level will deliver but 200 horse power at 15,000 feet and not quite 90 horse

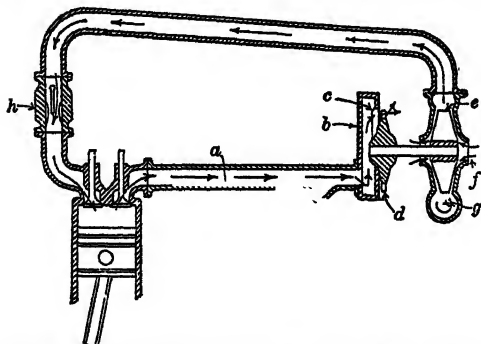
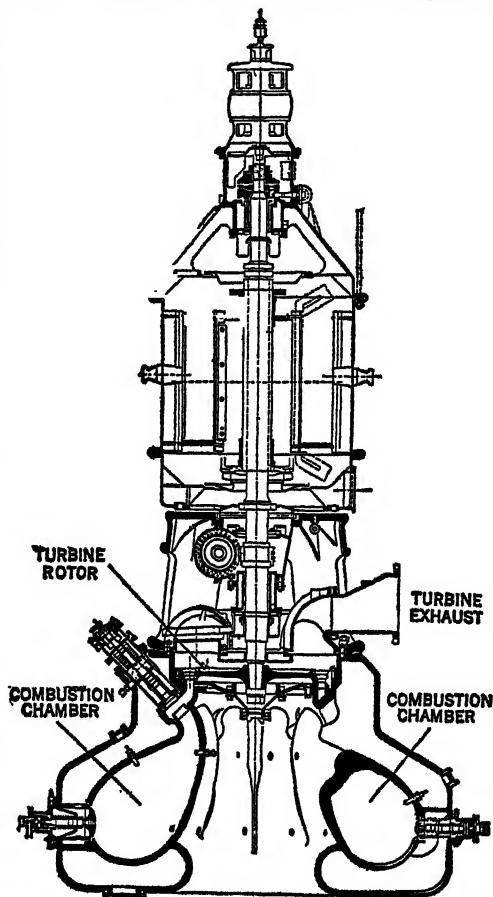


DIAGRAM ILLUSTRATING THE OPERATION OF A TURBO-SUPERCHARGER

power at 25,000 feet. While reciprocating, rotary, and centrifugal air pumps have been suggested and experimented with, the centrifugal type is best adapted for air-craft motors because of its simplicity, lightness, and freedom from pulsation. The supercharger may be gear-driven by the engine to which it is attached, or it may be driven by a gas turbine using exhaust gas which otherwise would be wasted by discharging it directly into the air. The gas turbine-driven supercharger had been most successful to date.

The diagram herewith shows clearly the way such a supercharger operates. The exhaust gas from the engine is led through a manifold, *a*, into a nozzle box, *b*, containing a series of nozzles, *c*. Through these nozzles the gas expands and reaches a high velocity before entering the buckets of the turbine wheel, *d*, which it drives at high speed. Air enters the impeller, *e*, through inlets, *f*, at the centre and is thrown by centrifugal force to the tips of the blades. At this point, a series of vanes surrounding the impeller converts the velocity of the air into pressure and guides it in a spiral path to the supercharger outlet and then through the air-cooler into the carburetor intake, *h*.

**Explosion Turbine.** Some engineers believe that the explosion turbine offers possibilities for future development, because one of the drawbacks of reciprocating piston engines, i.e., the inefficiency due to incomplete expansion after ignition, is not inherently present. In some forms of explosion turbines, the mixture is drawn or forced into a special combustion chamber where it is exploded, and the pressure thus produced causes the gas to escape through a nozzle and impinge upon a turbine wheel. A sectional view of an internal-combustion turbine built and operated in Germany by Holzwarth is shown. The design is ingenious, as the turbine is directly connected with a generator. Owing to the possibility of expanding



SECTIONAL ELEVATION OF THE HOLZWARTH VERTICAL-EXPLOSION TURBINE

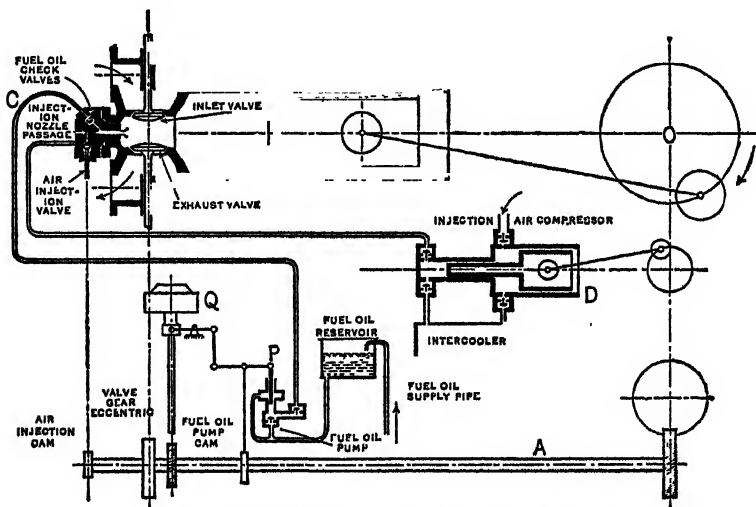
the gas to atmospheric pressure, this turbine would have a theoretical energy utilization about 67 per cent if the combustion and fuel-supply processes were the same as in a reciprocating piston engine.

One of the weaknesses of turbine design is that the compression of the charge prior to ignition does not take place in the explosion chamber but must be furnished by an outside compressor. Owing to the inefficiency of the compressors and the fact that a turbine rotor actuated by a gas with constantly falling pressure cannot be more than 60 per cent efficient, the theoretical thermal efficiency of a turbine drops from 67 per cent to a practically realized efficiency of but 13.8 per cent, or considerably less than that of the usual forms of reciprocating piston engines. Several inventors have tried to do away with compressors in gas turbines, or, if a compressor was used, to drive it by steam raised by the exhaust of the turbine. One of the advantages of the reciprocating type of engine is that the piston serves as a pump to draw in the gas; then as a compressor to compact the charge before ignition; then as a power element when forced down by the pressure of the exploded, expanding gas; and lastly as a scavenging medium, when it pushes the inert or exhaust gas out of the working cylinder. An explosion turbine is not a true internal-combustion engine, and its low efficiency makes its commercial prospects not particularly bright.

cylinder it is ignited by the temperature. The flow of oil is regulated by a needle valve, so that it enters comparatively slowly without increasing the pressure beyond 500 pounds. Any oil can be burned.

From the first engine of 60 horse power built in America in 1898, the use of the Diesel has extended until in 1928 over 400,000 horse power was sold, for practically every kind of power use. Of the Diesels so far built, 30 per cent is used for marine purposes. The "injection" or Diesel engine is broadly divided as to types into the two-stroke cycle and four-stroke cycle, both single and double acting. These broad divisions may be separated into *air-injection* and *pump-injection* types. In the former, air at 1000 pounds is used to blow the oil into the cylinder, while in the latter engines, a pump forces the oil through the spray nozzles at a pressure of about 5000 pounds per square inch. The air-injection type was the first to come into use, but at the time of writing (1929), the pump-injection engines represent about 75 per cent of the yearly sales.

Two distinct combustion processes are employed in pump-injection engines. For two-stroke-cycle engines, it has been found that the oil cannot be pumped directly into the cylinder. It is necessary to inject it into a cavity in the cylinder head, where it is partly vaporized and blows through an orifice into the cylinder proper. The separation of the oil and air gives time for the oil to be vaporized before combustion begins.



SCHEMATIC ARRANGEMENT OF DIESEL-ENGINE MECHANISM

**Diesel Engines.** The efficiency of any internal-combustion engine is dependent upon the final compression pressure. As gasoline, oil, or gas cannot be compressed beyond the extreme of 180 pounds per square inch on account of pre-ignition, Dr. Diesel proposed and built an engine in which nothing but air was compressed, and the fuel was not introduced until the piston had completed the compression stroke. As there was nothing but air in the cylinder, pre-ignition could not occur. The Diesel engine has a final compression pressure of approximately 500 pounds per square inch, and as the temperature raises with compression, the final temperature of the air in the cylinder is about 1200° F.; this is so hot that when the oil is sprayed into the

in four-stroke-cycle, pump-injection engines, the fuel may be injected either into a separate cavity or into the cylinder proper.

For powers up to 600 horse power, the solid-injection engine is used in preference to the air-injection engine, mainly because of first cost. Above this size, the air-injection engine's better performance offsets its higher cost at present. Beyond 3000 horse power, double-acting, air-injection engines are preferred. The largest Diesel built up to 1929 is a 9-cylinder air-injection engine installed in the Hamburg, Germany, light plant; pump-injection engines of 11,000 horse power were built in 1928 in Germany and Denmark. In the United States, the largest engine so far built is a six-cylinder, single-

acting, two-stroke-cycle unit with cylinders of 42-in. bore and 56-in. stroke, rated at 4000 horse power at 125 revolutions per minute.

As an example of novel designing, the accompanying illustration gives a sectional elevation through one of the cylinders of a three-cylinder, double-acting, two-cycle engine. This power plant has a cylinder bore of  $17\frac{3}{32}$  inches and a stroke of  $27\frac{3}{32}$  inches and delivers 850 horse power at 120 revolutions per minute. The problem of packing the piston rod against the explosion pressure is met by a very ingenious and carefully worked-out stuffing-box which permits the piston rod to reciprocate through the head of the lower cylinder. The stuffing-box is very deep and contains 11 sections of metallic packing; grooved rings divide them, to facilitate the distribution of lubricating oil. Each section consists of two rings split in halves which fit closely around the rod without springs, but they are kept close to the rod by a spring-clip ring carried in a retaining ring clear of the rod. The 11 sections are entered into the stuffing-box and held in position by the gland ring.

The fuel consumption of the average Diesel engine is 0.45 pounds per brake horse power per hour. This is much better than the gasoline engine, few of which type show a better performance than 0.75 pounds, but high-compression aviation engines have developed a horsepower-hour at an outlay of 0.5 pounds of gasoline, which fuel, however, has a greater heat value, 20,000 B.t.u. per pound, as compared to fuel oil with 18,000 B.t.u. Gasoline costs 17 to 20 cents per gallon and fuel oil but 4 to 6 cents.

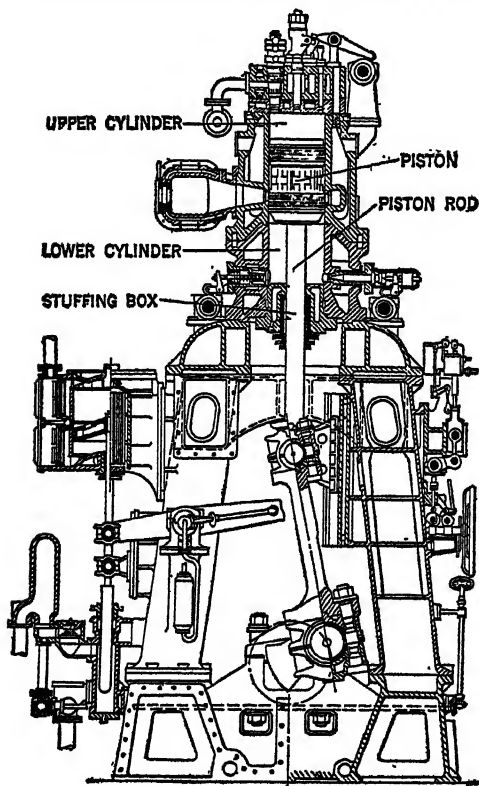
Until recently, the Diesel operated at slow

speed, 150 to 250 revolutions per minute. At present, many engines operating at speeds up to 1200 revolutions per minute are being built. The special fields of applications of these high-speed engines are shovels, excavators, rail cars, and locomotives.

The attempts to build light-weight Diesels for aviation have not been an entire success. To bring the engine weight down to 2 or 3 pounds per horse power, it is necessary to use high-unit stresses. As combustion cannot be controlled at high speeds, the cylinder pressures at times reach 1800 pounds per square inch, and certain parts are stressed almost to the elastic limit. In Germany, the Junkers' opposed-piston, two-stroke-cycle Diesel promises to be a successful venture for aviation work. In the United States, none of the engines built up to 1929 had been successful, but the Packard Motor Company in 1929 built a 9-cylinder radial air-cooled Diesel that operated satisfactorily in flight tests. For lighter-than-air craft, where lightness of engine is not so imperative, several Diesels are suitable and have been used. Ultimately, a light-weight Diesel will be produced, because it offers, for aviation application, the advantages of less fuel used and less fire risk, but has the disadvantage that it is less responsive to the throttle.

**Compound Diesels.** Various attempts have been made to compound the Diesel since Dr. Diesel's original patents on compounding. Almost invariably, the designer has confused the oil and steam engine. Because a steam engine is more economical when compounded, by reason of the decreased cylinder condensation, many engineers feel the same applies to the Diesel. This, however, is not true; for in the internal-combustion engine, it is necessary to cool the engine to prevent burning of the metal. The only advantage that compounding offers is the better applications or use of the metal in the engine. The final compression reaches 500 pounds per square inch and the pressure exists during part of the working stroke, the remainder of the stroke takes place at a falling pressure, but the entire engine must be built to withstand the 500-pound pressure. If the low-pressure part of the compression and expansion could be carried on in a separate cylinder, this cylinder could be made less heavy and the high-pressure part of the stroke would take place in a smaller cylinder. On the surface, compounding seems feasible, but the disadvantages of high internal temperatures in the high-pressure cylinder, due to the burning of a heavy charge of fuel in a small volume of dense air, and that of the heating of the transfer valve more than offset its advantages. So far, no success has attended the scores of compound engines that have been built and tested.

The Sperry compound oil engine, also illustrated, is still in the experimental stage. The arrangement of the engine consists of two high-pressure, four-cycle cylinders and a simple low-pressure cylinder. The high-pressure pistons are of plain-trunk type. The low-pressure piston has an extension of smaller diameter than the main piston. The annular space between this extension and the main piston serves as an air pump. The pump compresses air from atmospheric to a moderate pressure into a small receiver. On the down or inlet stroke of the high-pressure pistons, air under pressure from the receiver passes through the inlet-valve sleeve



A THREE-CYLINDER, DOUBLE-ACTING, TWO-CYCLE 850-BRAKE-HORSE-POWER DIESEL ENGINE



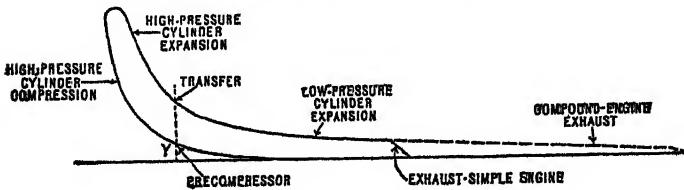
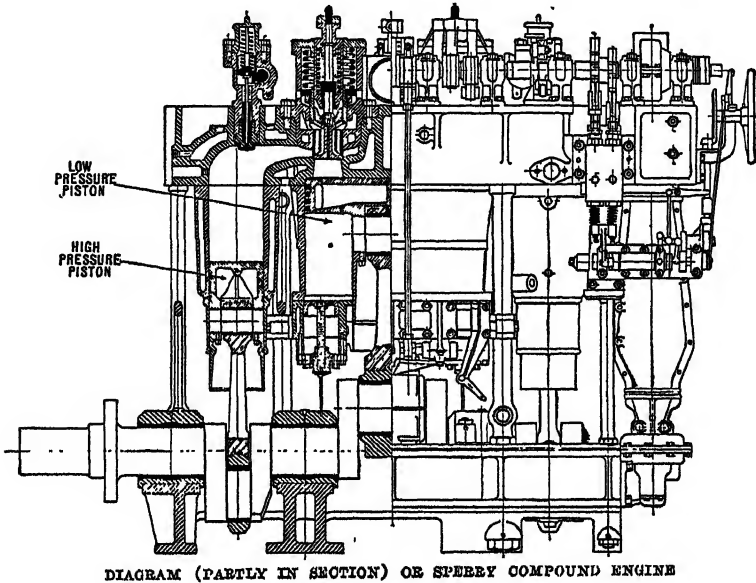
and cools it, until the pistons are at the end of the stroke. The air is then compressed on the up-stroke to about 500 pounds per square inch when fuel is injected.

The resulting combustion and expansion of the gases drive down the high-pressure piston to the end of its stroke, when the low-pressure piston, which is on the beginning of its working stroke, receives the gases from the high-pressure cylinder through the transfer port that has been opened by lifting the transfer valve from its seat into a water-jacket cavity so that only its lower surface is washed by the passing gases. To prevent any serious drop in pressure between the high- and low-pressure cylinders when the transfer takes place, the exhaust-valve is closed somewhat before the low-pressure top centre and the gases are cushioned to a pressure equal to

value; so the point where the greatest gain can be made is in fuller utilization of exhaust gases.

In many installations, when hot water is needed, it is possible to take the jacket-cooling water and, after passing it through an exhaust-gas heater to further increase the water temperature, to use it. It is possible to recover in this way about 4500 B.t.u. per horse-power-hour developed by the engine. If steam instead of hot water is needed, it is possible by passing a part of the warm water from the jacket through an exhaust-gas boiler to obtain 1.25 pounds of steam at 50 pounds pressure per horse-power-hour developed in the engine.

**Still Oil-Steam Engine.** An attempt to utilize the waste heat of the exhaust gas is the Still engine, which combines steam and oil power so advantageously that the brake thermal effi-



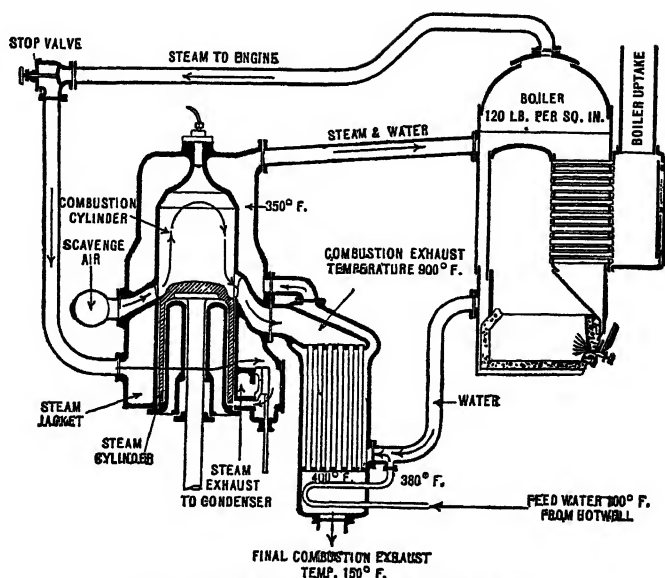
TYPICAL INDICATOR CARD OF SPERRY COMPOUND ENGINE

that being transferred from the high-pressure cylinder. The cranks of the two high-pressure cylinders are set together and 180 degrees from the low-pressure crank. The high-pressure cylinders fire and transfer alternately into the low-pressure cylinder, so that every down-stroke of that cylinder is a working stroke.

**Waste-Heat Recovery.** In internal-combustion engines of either the constant-volume or constant-pressure type, the combined heat losses in radiation, cooling water, and exhaust gases range between 65 and 75 per cent. It will be evident that any practical attempt to utilize the waste heat will increase the thermal efficiency. Heat losses due to the cooling water or radiation cannot be reduced beyond a certain minimum

efficiency of such an engine may go as high as 44 per cent. Its primary object is not to use the waste heat for raising steam, but first to use it in improving the thermal conditions of the working cylinder and so to insure the maximum efficiency from the fuel burnt within it and as a consequence, to diminish the heat lost in that operation. Since the maximum efficiency is obtained when the jacket losses are at a minimum, it is evident that the larger the quantity of steam which can be generated per horse power developed by the combustion cycle, the lower must be the heat efficiency of the whole machine.

In the Still engine, the jacket and cooling water form part of the circulating system of a steam generator, which may be an integral part



STILL COMBUSTION AND STEAM-ENGINE ACTION

of the engine or external to it. The cooling water therefore enters and leaves the jacket at a constant temperature, regulated by the pressure of the steam; the cooling is effected by converting the water into steam without raising its temperature. Excluding the radiation losses, which are kept low by lagging, all the heat which passes through the walls is thus usefully recovered in the water as steam. During compression, because of the walls being at steam temperature, the incoming charge picks up heat instead of losing it, during the greater part of the stroke. This is an advantage of the greatest value to the heavy-oil types of Still engine, where an air charge is taken in at the full out-stroke and is compressed to a pressure where its increased temperature insures the certain ignition and combustion of the fuel which is injected into it. During combustion and expansion, the uniform and higher mean temperature of the wall reduces the heat lost to the jacket water. Some of the heat thus economized adds to the useful work on the piston, the remainder passing out in the exhaust gases for recovery. The steam developed is directed to a special steam cylinder, that may be the lower end of the oil engine or may be a separate engine. It is believed that there is a future for the combination of the steam and combustion cycles. It has the disadvantage, however, of extremely high first cost and with the present cost of fuel oil does not seem to be commercially advantageous. See **MOTOR VEHICLES; CHEMISTRY, APPLIED; PETROLEUM.**

**INTERNAL WATERWAYS.** See **CANALS.**

**INTERNATIONAL.** See **COMMUNISM; SOCIALISM.**

**INTERNATIONAL AÉRONAUTIC FEDERATION.** See **AÉRONAUTICS.**

**INTERNATIONAL BANK.** See **REPARATIONS.**

**INTERNATIONAL EDUCATION, INSTITUTE OF.** See **UNIVERSITIES AND COLLEGES.**

**INTERNATIONAL INSTITUTE OF AGRICULTURE.** See **AGRICULTURE, INTERNATIONAL INSTITUTE OF.**

**INTERNATIONAL LABOR OFFICE.** See **LABOR ORGANIZATION, INTERNATIONAL.**

**INTERNATIONAL LABOR ORGANIZATION.** See **LABOR ORGANIZATION, INTERNATIONAL.**

**INTERNATIONAL LANGUAGE.** The initiative in establishing a sort of clearing house for all questions connected with the problem of a world language belongs to the International Research Council. They created a Committee on International Auxiliary Language, located in Washington, D. C., under the direction of Dr. Nichols and Dr. Cottrell, which undertook to send out information generously to any serious inquirer. In 1924 the two chief solutions were an arrangement that would favor living languages, and an artificial language. The basis for discussion of an established living language to be used as an international language remained the "Projet Chappelier," suggesting an agreement between English- and French-speaking countries, that the first require in all their schools the teaching of French, and the second the teaching of English. This would force other nations to teach at least one of the two, and thus the goal would be reached. Famous men gave their support to the idea, among them Wells, Richet, and the great linguist, Bréal. The best explanation of the plan is found in Dauzat's *Le Français et l'Anglais, Langues Internationales* (1910). It is unfortunate that Dauzat hurt his cause considerably by indulging in very unintelligent criticism of other solutions of the problem; nobody can see in him an impartial student. The plan was from 1915 endorsed by the well-known critic, Ernest Charles, and by the American philosopher, Mark Baldwin. For some details and references, see the various issues of the *New International Year Book*.

There were, of course, many projects of artificial languages before the public, but three really counted: Esperanto (for information in America, address Esperanto Association, Boston, Mass.); Ido (American headquarters in Pittsburgh); and Esperantido (Washington, D. C.). In 1922 the Institute of International

Education launched a movement in favor of a modernized Latin, not so much, it seems, because of belief in it, but rather out of fear that an auxiliary language might otherwise triumph. From the first weeks of the World War, Esperanto rendered extremely valuable service both in the Red Cross divisions, and in the work of the prisoners' camps. At the same time, the Germans took advantage of Esperanto to spread much propaganda among neutrals, which naturally hurt the cause of Esperanto in the eyes of the Allies (who were slow at hitting back with the same arm). In 1916 the Chappelier plan was seriously revived, and Dauzat suggested some interesting modifications to it. In some quarters, the end of the War was expected for the end of 1916 or beginning of 1917; in view of this, the Board of Trade of London favored the study of the question of an international language to help business to pick up rapidly. At the same time, the Germans, seeing things take a favorable turn for them, began to talk about German as an international language, and spoke of a "Welt-deutsch," a natural organ for Pan-Germanism. But the War went on, and remarkable headway was made in 1917 and 1918 by artificial languages, especially Esperanto, in the Far East. Then, as the War ended, a lively race began between the chief rivals, Esperanto and Ido. Esperanto seemed to see a chance for victory in winning to its cause the exploited classes and even the Russian Soviets, while the Idists seemed to prefer to win the intellectuals. Lord Northcliffe, in England, and the philologist, Meillet, in France, agreed that, as a language, Ido was superior to Esperanto. This discussion of actual *linguistic* superiority prompted Dr. René de Saussure, of Berne, Switzerland, to offer his system, combining, he maintained, the excellent points of both Esperanto and Ido, and which he called Esperantido. Later, in 1925, he withdrew his new plan to rally to Esperanto—not because he thought the latter perfect, but for the sake of a united front. The plan of a simplified Latin, proposed that same year by Professor Peano of the University of Turin, had a moderate following.

Together, these groups tried to bring the question before the Peace Council in Paris, and having elicited a note of "interest" from Wilson, worked with more vigor than ever. After the Peace Council, the League of Nations was approached several times. In 1921 the League delegated Dr. Nitobe to the Congress of Esperanto that was to be held in Prague, August 29 to September 6. The report, made on September 12, brought about the nomination of a committee to investigate the matter. The problem was finally turned over to the committee on intellectual coöperation, of which such persons as Bergson, Einstein, and Mme. Curie were members; and these finally decided, in a report of Aug. 1, 1923, not to recommend an artificial language. Meanwhile, the International Research Council, which had met in Brussels in 1919, appointed a committee to investigate the matter of an artificial language "of the type of Esperanto" and which would be "placed under scientific control." After that time, the committee on international auxiliary language, at Washington, became active. They asked the Philological Association and the Modern Language Association to appoint committees. Both made cool replies, but Washington went on. The question was brought up and discussed

at the meeting of the American Association for Advancement of Science at Toronto, in December, 1922, and again at their meeting at Cincinnati in December, 1923. The study of the problem was endorsed. Some meetings in New York, April, 1923, with a view to fostering the cause, and counting among their supporters several names famous in the scientific world, must also be recalled. The artificial languages received severe rebukes in 1925, in Ann Arbor, and in 1926, in Cambridge, Mass., at the meetings of the Modern Language Association—not officially as a body, but by individual members; in December, 1925, it was in the president's speech, Dr. Collitz, of Johns Hopkins; in 1926, it was at the hand of Professor Mykl, of Marquette University. In 1925, thanks to a gift of \$2,500,000 by Mrs. Dave H. Morris, an International Auxiliary Language Association (Iala) was formed at Columbia University with Prof. H. N. Shenton, as secretary. It amounts to a sort of clearing house—with sales service and information service—for all ideas connected with the problem of international language. Its first *Bulletin*, was published in May, 1925. That year also witnessed a continuation of the endeavors to gain ground in Geneva, the seat of the League of Nations. An elaborate Esperanto Congress took place there in August, promptly followed by an Ido Congress; while G. de Reynold tried to ward off both in advocating Latin once more, in a vigorous article of the *Revue de Genève*. This was—up to 1929—the last flare-up of the cause. The annual congresses of Esperanto and Ido still take place, but arouse little interest; the attempt to use radio did not succeed much; and the attempt on the part of some women (even women's colleges such as Vassar and Mount Holyoke, see *New International Year Book*, 1925) to make it one of their goals, seems to have harmed the cause rather than helped it. Owing to the political prestige of the United States, English is gaining more and more adherents as a future world language.

The most interesting bibliographical material bearing partly on this problem includes the very suggestive book of A. Meillet, of the Collège de France, *Les Langues de l'Europe Nouvelle* (1918), last chapter; A. L. Guérard, *Short History of the International Language Movement* (London and New York, 1922); a very valuable article by Professor Sapir, in the *Romanic Review* of June, 1925 (claiming that both Esperanto and Ido could stand serious improvement); Henriette Roumigiùère, "Le français dans les relations diplomatiques," forming No. 4 of vol. xii of the University of California *Publications in Modern Philology*, 1928; which gives, however, often less than F. Brunot in his *Histoire de la Langue Française*, or Scott in his book on the same subject—and in much briefer form. See PHILOLOGY, MODERN.

**INTERNATIONAL LAW.** See BLOCKADE; LEAGUE OF NATIONS, under *Progressive Codification of International Law*.

**INTERNATIONAL SOCIETY FOR CONTEMPORARY MUSIC.** See MUSIC.

**INTERNATIONAL TRADE-UNIONISM.** See TRADE-UNIONISM.

**INTERSTATE COMMERCE COMMISSION.** See RAILWAYS.

**INVESTMENT TRUSTS.** The term "investment trust" has been well known in Great Britain for a good deal more than half a century. In that country, active development of invest-

ment trusts as a means of applying and collecting comparatively small sums under conditions of relative safety proceeded vigorously after the year 1860 and has finally reached the highly developed stage in which the resources of British investment trusts of all classes (land and finance) were estimated at £400,000,000. In the United States, the term "investment trust" was hardly known prior to the close of the World War (the first recorded instance of such a trust dating only from 1907). Since the year 1920, a substantial growth of investment trusts has taken place, partly as the result of foreign investment in the United States, and partly because of the constantly widening interest of American investors in stocks and bonds as a means of applying savings. Estimates made as of June 30, 1928, showed fully 199 trusts then operating with \$1,200,000,000. Later estimates, based on the great growth which occurred during 1928-29, indicate a tentative total of at least \$1,000,000,000 more added during the year closing June, 1929. Probably most of those that have been established in the United States, however, have headquarters, or at all events, an office, in New York City.

The investment trust is what its name implies—a trust fund established by contributions from individual investors who want to turn over the business of managing their funds to others. The management of an investment trust may thus be individual or corporate. In the latter case, a management corporation is formed whose purpose it is to receive, invest, manage, and eventually to distribute the earnings of, moneys placed in its hands by investors. There are still various cases in which persons have merely acted in their individual capacity as trustees for funds deposited with them by others which they have pooled as received and have used for the purchase of securities which, in their opinion, were sound.

In order to establish confidence, the individual or management corporation engaged in operating an investment trust often follows the plan of placing the securities growing out of successive operations with a recognized trustee institution—usually, under American law, a trust company. An indenture specifying the conditions under which funds will be received, investments made, and the resulting securities set aside and from time to time withdrawn and sold, is drawn up and, upon the basis of this indenture, the trust company which has been selected as holder of the securities "accepts" the trust, agreeing to carry out the provisions of the indenture in so far as the holding and disposing of securities are concerned. This leaves the management company, with its board of directors, responsible for altering the securities of the trust, taking in the resultant proceeds, determining what securities to buy, making the purchases, placing stocks and bonds thus acquired with the trust company, and from time to time determining upon a withdrawal and sale (if so permitted by the indenture). But the funds may be, and often are, retained in the hands of the management company.

In its simplest form, the investment trust assumes the shape of a so-called "fixed fund" which is invested in a specified list of securities. Titles to ownership are represented by shares, or certificates. Thus, for example, the investment trust may undertake to purchase 100 shares each of 10 named companies and to de-

posit the whole 1000 shares with a trust company, thereafter selling, let us say, 1000 shares or certificates each of which entitles its holder to a proportionate share or ownership in the entire body of securities so deposited. In this case, management is reduced to a minimum, since the purchases are made in a specified way, and it is usual to provide that in the event a given issue of stock is retired or must otherwise be disposed of, the resulting funds shall be reinvested in the remaining securities of the original list. The holder of the investment trust shares, or certificates, thus becomes entitled merely to his pro-rata share of the entire receipts and to a corresponding pro-rata distribution of the proceeds at the time when the trust matures or ends, or is dissolved.

A more complex form of undertaking is afforded by a so-called "managed" list of investments. In such a trust, the management company merely undertakes to buy any securities it pleases and to sell them when it thinks fit. This form of management may be accompanied by published statements of holdings from time to time, as a matter of good faith, or may be of the "blind pool" type, in which the managers are obviously stock-market operators, buying and selling when and as they deem best. Of course, in such a case, the investment trust usually announces, or at all events guides itself, by an "investment policy" which may involve merely more or less mechanical diversification, such as (in one actual case), the keeping of the funds in not less than 400 different securities distributed in specified proportions between industrials, rails, government issues, and other types of obligations. Most of the recent discussion of investment trusts has centred around this question of investment policy and method of using and accounting for the funds received. The latest development of the investment trust in the United States has been its use for the placing of funds in certain fields such, for instance, as oil shares, chain-store stocks, and the like, dividing them among the more promising enterprises in these fields.

It should be noted that in many investment trusts, particularly of the English type, the practice of depositing with a trust company is omitted. In this case, the management corporation either increases its stock from time to time; so that the investor becomes a stockholder of the management corporation (and buys no certificates or debentures), or else it issues debentures which bear a fixed rate of interest and in some cases are accompanied by warrants entitling the holder to receive shares in the corporation, junior to those of the organizers and contributors of capital. In this case, the debenture holder gets a fixed rate of interest first of all and then a division of profits is made between him and the managers of the corporation who presumably hold its senior stock, or a substantial share of the junior stock, or both.

It is evident that whether the latter type or one of the other forms be employed, the profit to the managers of the investment trust comes from the fact that they sell participating rights (in income or capital) to investors at a figure higher than is necessary to acquire the securities which are bought for the trust. In the best-managed and most straightforward investment trusts, the actual cost to the investor is usually made plain. It may run from 6 to 7 per cent of income, and varying percentages of gain

up to any amount to which managers can induce investors to assent. The remainder of earnings from appreciation may, in some cases, be continuously reinvested in securities, thereby enhancing the worth of the main body of the trust, or may be periodically declared as dividends to stockholders.

One of the latest and also the most regrettable developments of the investment-trust movement is its use by the bond and security-issuing houses as a means of relieving themselves of left-over or unsalable fag-ends of issues not fully disposed of to the public. These remnants of unsalable issues are dumped into an investment trust controlled by the issue house, and the certificate or stock issues representing it are then sold to the buyer of investment-trust obligations. This procedure naturally neutralizes the expected effects of diversification and careful investment choice.

Investment policy is a vague phrase which has no well-defined meaning. In general, its objects are to obtain the maximum return which is consistent with safety. The object of the investment trust, however, is not primarily safety in the ordinary sense of the term, but is that of enabling the owner of small resources or the man who is too much occupied with his own affairs to give thought to the question of investment to obtain access to the earnings which come from business profits, rather than to be obliged to content himself with mere interest on his "money." The protection of the investor is thus found in wise investment, or wise use of funds, and there is danger that success will be taken as the only test of wisdom, so that investment-trust managers who speculate successfully will be regarded as the soundest elements in the profession. Recognizing this danger, most investment-trust managers deem it wise to make a plain statement at the outset as to the general direction in which they propose to apply their funds, as well as to the markets in which they intend to operate.

In some cases, they also commit themselves as to policy with respect to the purchase of dividend-paying securities and as to the course they intend to follow in using earnings derived from appreciation of capital—whether in distribution or in improving and enlarging the value of the main body of the trust. Diversification in some one of its many forms is thus at the bottom of investment policy of most of the trusts, while other questions bearing upon the methods of selection are dealt with in varying ways. American trusts on the whole have emphasized turnover and rapid profit from sales and purchases, while British trusts have in the main laid emphasis upon making good individual choices, relying on the directors' information and purchasing for a "long pull."

The so-called Edge Act, adopted in 1919 as an amendment to the Federal Reserve Act, provides for the organization of Federal investment trusts, but only one such trust existed in 1928. State laws, for the most part, have reference only to conditions of trusteeship and provide little regulation of the operations of the management companies. The Attorney General of New York, after a lengthy investigation in 1927, published a report containing a variety of suggestions for investment-trust control, none of which was seriously considered, and none of which has resulted in positive action. The management of investment trusts also was seriously discussed

by the Investment Bankers Association during the year 1928, but without practical results.

**Bibliography.** Among recent books dealing with investment trusts may be mentioned Fowler, *American Investment Trusts*; Grayson, *Investment Trusts, Their Origin, Development and Operation*; Robinson, *Investment Trust Organization and Management*; Keane, *Manual of Investment Trusts*; Speaker, *The Investment Trust*; and Steiner, *Investment Trusts, American Experience*.

**IORGA**, yôr'gă, NICOLĂE (1871- ). A Rumanian historian and political leader (see Vol. XII). As head of the National Party, he followed an independent course, refusing to unite with the new National Peasant Party formed following the World War. He continued his activities as editor of the *Neamul Românesc*, the weekly organ of his party, and in 1916 also became editor of *Revista Istorică*, a historical review. In 1920 he was director of the Rumanian School of Paris. His later works included *Histoire des États Balcaniques à l'époque moderne* (1914).

**IODINE.** See FOOD AND NUTRITION; and GOITRE.

**IOWA.** The twenty-fourth State in size (56,147 square miles) and the sixteenth in population; capital, Des Moines. The population increased from 2,224,771 in 1910 to 2,404,021 in 1920, a gain of 8.1 per cent; estimated population, 1928, 2,428,000. The white population rose from 2,209,191 (1910) to 2,384,181 (1920); Negro, from 14,973 to 19,005; native white, from 1,935,707 to 2,158,534. The foreign-born white population showed a decrease, from 273,484 to 225,647. The urban population mounted from 680,054 to 875,495, while the rural fell from 1,544,717 to 1,528,526. The population of the principal cities increased as follows: Des Moines (q.v.), 86,368 to 126,468; Sioux City, 47,828 to 71,227; Davenport, 43,028 to 56,727; Cedar Rapids, 32,811 to 45,566.

**Agriculture.** As Iowa is one of the chief agricultural States, conditions in the period since the World War have reflected fluctuations in production and values which marked the epoch. (See AGRICULTURE, CORN, and WHEAT.) The number of farms changed but slightly, from 213,439 in 1920 to 213,490 in 1925; the acreage declined from 33,474,896 to 33,280,813 in 1925. The improved land in farms embraced 28,006,951 acres in 1920. Crop land totaled 21,997,075 acres in 1925. The total value of farm property rose from \$3,745,860,544 in 1910 to \$8,524,870,956 in 1920, but declined to \$5,602,077,895 in 1925; the average value per farm was \$17,259 in 1910, \$39,041 in 1920, and \$26,240 in 1925. Prices of farm land increased greatly in the war period, stimulated by prices of products. In interpreting these values, the inflation of the currency incident to the World War is to be taken into consideration. The total percentage of land used for agricultural purposes decreased from 95.4 in 1910 to 94.1 in 1920, and 93.8 in 1925. Of the total number of farms in 1925, 116,444 were operated by owners; 1650, by managers; and 95,396, by tenants. The corresponding figures for 1910 are 133,003; 1926; and 82,115. The white farmers in 1920 numbered 213,330, compared with 216,843 in 1910; colored farmers, 100, compared with 201. Farms reported as under mortgage numbered 66,096 in 1920; 64,781 in 1925. The total number of cattle in 1920 was 4,557,708; in 1925, 4,



264,493; dairy cows numbered 1,519,510 in 1920 and 690,411 in 1925; swine, 7,864,304 in 1920 and 8,567,131 in 1925; sheep, 1,092,095 in 1920 and 818,403 in 1925. The estimated production of the principal farm crops in 1928 was as follows: Corn, 476,012,000 bushels; wheat, 8,270,000; oats, 240,040,000; barley, 27,068,000; potatoes, 10,935,000; and hay, 4,516,000 tons. Comparative figures for 1913 are corn, 338,300,000 bushels; wheat, 10,395,000; oats, 168,360,000; barley, 10,000,000; potatoes, 7,200,000 bushels; and hay, 4,440,000 tons.

**Mining.** The principal mineral products of Iowa are coal, cement, gypsum, and clay products. There is practically no metal mining in the State. The coal production during the period starting with 1914 showed considerable fluctuation, as will be noted from the following figures: 1914, 7,451,022 short tons, valued at \$13,364,070; 1917, 8,965,830, \$21,096,408; 1918, 8,192,195, \$24,703,237; 1919, 5,624,692, \$17,352,620; 1920, 7,813,916, \$30,794,000; 1921, 4,531,392, \$17,256,800; 1922, 4,335,161 tons; 1926, 4,625,487 tons, \$14,214,000; 1927, 2,949,622 tons, \$9,304,000. The decreases in 1921-22 and 1927 were due to the protracted coal-miners' strikes which affected all the Middle Western coal fields. Shipments of cement rose moderately during this period. They ranged from 4,224,076 barrels in 1914 to 3,188,669 in 1918 to 4,421,783 in 1920 and 5,415,144 in 1927. The value virtually doubled in the period of the World War because of the decreased purchasing power of money and the consequent higher prices. Clay products fluctuated from the value of \$6,401,745 in 1914 to \$5,313,394 in 1918 and \$4,459,724 in 1926. Gypsum is one of the most important mineral products: there were produced in 1914, 480,404 short tons; 1918, 327,927; 1920, 571,895; and in 1926, 802,910. In addition to the minerals noted, the State produces mineral waters, sand, and gravel. The total value of the mineral products in 1926 was \$35,971,787, compared with \$57,250,480 in 1920; \$37,882,183 in 1919; \$38,742,009 in 1918; and \$26,287,115 in 1914.

**Manufactures.** Although Iowa is not one of the most prominent of the manufacturing States, it is of considerable industrial importance. There are 18 cities having a population of more than 10,000. These form 25.1 per cent of the total population of the State, and in 1919 they reported 78.4 per cent of the total value of its manufactured products. There were in the State, in 1909, 5528 manufacturing establishments; in 1919, 5683; in 1925, 3219; in 1927, 3061. The wage earners in manufacturing numbered 80,551 in 1919, 74,257 in 1925, and 73,692 in 1927; and the capital invested amounted to \$171,218,604 in 1909, and \$403,205,513 in 1909. The value of the products in 1909 was \$259,237,637; in 1919, \$745,472,697; in 1925, \$746,320,586; in 1927, \$769,340,610. The chief industry in point of value of product is that connected with slaughtering and meat packing, with a value of \$59,045,000 in 1909; \$226,865,000 in 1919; \$213,741,084 in 1925; and \$212,353,210 in 1927. The manufacture of butter, cheese, and condensed milk ranks second: in 1919, \$25,850,000; in 1919, \$57,800,000; in 1925, \$78,110,309. Car construction and repair, in third place, had products valued in 1909 at \$10,269,000; in 1914, \$11,434,000; and in 1919, \$33,099,000. Flour-mill and gristmill products were valued, in 1909, at \$12,871,000; 1914, \$14,337,000; 1919, \$21,-

325,000; and 1927, \$13,288,322. The increase in value of products about 1919 was due largely to changes in industrial conditions brought about by the War, and therefore cannot properly be used to measure the growth of manufactures. An increase, however, in the number of wage earners from 63,113 in 1914, indicated a decided growth in manufacturing activities. The chief manufacturing cities are Cedar Rapids and Des Moines. There were in Des Moines, in 1909, 387 establishments, with a product valued at \$23,585,000; in 1919, 379, with \$59,831,000; in 1925 335, with \$83,624,093; in 1927, 300, with \$76,108,331. In Cedar Rapids, there were 153 establishments in 1909, with a product of \$24,824,000; 170 in 1914, with \$34,989,000; and 208 in 1919, with \$92,118,000. Other important manufacturing cities are Council Bluffs, Dubuque, Fort Dodge, and Muscatine.

**Education.** No State has devoted more attention to education than has Iowa. The result of this is indicated by the fact that it is lowest in percentage of illiteracy and that although the enrollment in the public schools decreased after 1900, as the State lost in population, the average daily attendance showed a large increase. Particular attention was given to rural-school problems, and in the supervision of rural schools great improvement was shown. The General Assembly established the Standard School as a means of taking care of children and teachers in the rural schools, the Evans-Smith Law making an appropriation of \$100,000 annually to help the one-room school. The consolidated school had been in operation in the State for about 15 years, but only latterly had rapid development begun in it. From 1918 to 1922, the number of consolidated schools practically doubled. Vocational education was introduced as a part of the educational system and work started in agriculture, trades and industry, home economics, and teacher training; and in connection with this work, civilian rehabilitation was carried on. In 1922 courses in vocational agriculture were given in 43 high schools. A law enacted by the 38th General Assembly requires that the subject of American citizenship shall be taught in all public and private schools in the State. In 1900 there were enrolled in the public schools 566,223, and in 1925-26, 556,270, students, when the average daily attendance was 445,935, as against 373,474 in 1890-1900. Of the total enrolled in 1925-26, 444,376 were in elementary, and 111,894 in secondary, grades. Expenditures for public day schools in 1925-26 were: current, \$50,996,065; outlays, \$6,284,000. The percentage of illiteracy decreased from 2.2 in 1910 to 1.4 in 1920; among the foreign-born whites from 10.3 per cent to 10.2; among the Negroes, from 15.9 to 11.2.

**Finance.** State expenditures in the year ending June 30, 1928, as reported by the U. S. Department of Commerce, were: for maintenance and operation of governmental departments, \$22,504,088 (of which \$796,987 was aid to local education); for interest on debt, \$888,503; for permanent improvements, \$17,255,799; total, \$40,648,389 (of which \$18,322,415 was for highways, \$3,908,499 was for maintenance and \$14,413,916 for construction). Revenues were \$41,183,371. Of this, property and special taxes formed 27.8 per cent; departmental earnings and charges for officials' services, 13.8 per cent; and sales of licenses and a tax on gasoline, 38.0 per cent. Property valuation was \$1,495,674,319;

State taxation thereon, \$9,610,800. Net State funded debt on June 30, 1928, was \$18,847,990.

**Political and Other Events.** As the chief interest in the State is agriculture, which was greatly affected by conditions following the War, the radical group which demanded legislation for the benefit of the farmers developed great power. It succeeded in electing its candidates for the United States Senate and other offices. In 1914 Henry Vollmer, a Democrat, was elected to the House, and George W. Clarke, Republican, was elected governor. Senator Albert B. Cummins was reelected. The political campaign in 1916 was particularly bitter, and local interest, to a large extent, superseded interest in the presidential election. W. L. Harding, Republican candidate for governor, was elected, together with the entire State Republican ticket. For President, the vote was 230,499 for Hughes and 221,669 for Wilson. In 1918 W. L. Harding was reelected governor. In 1920 elections were held for governor and other State officers and for United States Senator. Albert B. Cummins was reelected to the Senate, and N. E. Kendall, Republican, was elected governor. For President, W. G. Harding received 634,674 votes and J. M. Cox 227,921. In 1922 William S. Kenyon, United States Senator, resigned to become Federal judge, and Charles A. Rawson was appointed to succeed him. Smith W. Brookhart, the candidate of the radical Republicans, defeated the Democratic candidate, Clyde L. Herring. Governor Kendall was reelected for a second term. The people at this election voted in favor of the soldiers' bonus. John Hammill was elected governor in 1924; D. F. Steck, Democrat, defeated Brookhart for senator in an election followed by a protracted contest. Brookhart, however, gained the States' other Senate seat in 1926, when Hammill was reelected governor. In 1928 the presidential vote was: Hoover, 623,818; Smith, 378,936. Hammill was again elected governor.

**Legislation.** The most important acts of the Legislature in the period from 1914 are noted below. The Legislature of 1915 passed several measures relating to liquor reform and liquor regulation. The so-called "muley liquor law" was repealed. A bill providing for the submission of the question of prohibition to the people was passed, and also a measure providing for the submission of a woman-suffrage amendment in 1917. The Legislature also enacted a stringent child-labor law and abolished the contract prison labor system. In 1916 the Legislature provided a moratorium for men in the military and naval services. The Legislature of 1919 passed special provisions permitting women to vote for President; it also passed statutes defining and punishing criminal syndicalism and sabotage. In 1923 the Legislature passed a measure making a crime of the possession of drugs illegally obtained. It also enacted a law assembling activities relating to crime into a single department and a measure making the sale of narcotics a felony; it abolished distinctions in voting between men and women. The law against the sale of cigarettes was modified by permitting the sale of cigarettes to adults in the State. The Legislature in 1927 transferred responsibility for roads from the counties to the State, and in 1928 provided for a \$100,000,000-road-bond issue.

**IOWA, UNIVERSITY OF.** A State institution of higher learning for men and women, at Iowa

City, founded in 1847. The student enrollment increased from 2669 in all departments in 1913-14, to 9249 in 1927-28. The summer-session registration in 1928 totaled 4473. The faculty in the autumn of 1928 consisted of approximately 600 members, as compared with 275 in 1914; the library was increased during the same period from 174,000 to 279,575 volumes in the general library and 47,866 in the law library. The income for 1927-28, including revolving funds, was \$6,440,898. The period under review brought many improvements to the University campus, including: a dentistry building erected in 1917; a men's dormitory in 1919; the Children's Hospital, the Psychopathic Hospital, and a nurses' home in 1921; and a chemistry building in 1923. In the latter year, the restoration of the first Statehouse of Iowa, the university's administration building, was nearly completed, and a large recitation hall of Bedford limestone was begun. The campus also was increased during this period from 50 to nearly 300 acres. In 1925 a university observational school building was completed and put into service, a large medical laboratories building was under construction, and plans formulated for the construction of a new hospital to bring the capacity of the hospital up to about 1200 beds; the first unit of the Iowa Memorial Union was under construction in the same year, as well as the Quadrangle with a capacity of 700 men. In 1927 two wings of the nurses' home, a new field house, second unit of the Iowa Memorial Unit, and second unit of the chemistry building were under construction or completed; and in the following year, the new \$5,000,000 general hospital was completed and occupied.

By gifts of the General Education Board and the Rockefeller Foundation, matched by equal amounts appropriated by the State Legislature, the sum of \$4,500,000 became available in 1922 for the extension and reconstruction of the plant of the medical school, making possible the construction of the new laboratory, and the increase in floor space in the Children's Hospital, construction of new nurses' homes, and the construction of the above-mentioned general hospital. In 1917, the Iowa Child Welfare Research Station was established for the scientific study of normal children, and in 1921 the school of commerce was reorganized as the college of commerce. Thomas H. Macbride, Ph.D., LL.D., retired from the presidency in 1916, and was succeeded by Walter Albert Jessup, Ph.D., LL.D.

**IOWA STATE COLLEGE OF AGRICULTURE AND MECHANIC ARTS.** A State coeducational institution at Ames, Iowa; established in 1868. The total number of students in attendance rose from 3458 in 1914 (including short-course students) to 4022 regular students in the autumn of 1928, with an additional registration of 2353 in the summer sessions, and the faculty from 217 to 373; the library was expanded from 45,000 to 160,000 volumes; and the annual income increased from \$3,000,000 to \$4,267,000. The endowment in 1928 amounted to \$695,000. The following buildings were among those erected during the period: Four women's dormitories, plant propagation building and greenhouse, science building, hospital, armory, animal husbandry laboratory, agricultural engineering building, poultry laboratory, dairy judging pavilion, sheep, horse, hog, and dairy barns, a library of 250,000 volumes' capacity, a home economics building, a dormitory for women, and

in 1928, a dairy industry building, chemical engineering building, and memorial union. President, R. M. Hughes.

**IRAQ (Mesopotamia).** A British mandate territory, lying between the Tigris and Euphrates rivers and made up of the former Turkish vilayets of Bagdad, Basra, and Mosul. Area, 143,250 square miles; population in 1920, 2,849,282. The population is largely Arab by race and Mohammedan by religion. Turks, Kurds, Jews (in the towns), Christians belonging to Roman Catholic and Syrian Catholic churches, and some Persians were also to be found. By religions, the population was divided into 1,146,684 Sunnis and 1,494,015 Shiah (both Mohammedans), 87,488 Jews, 78,792 Christians, and 42,302 others. Basra, at the head of the Persian Gulf, is the chief town; Bagdad is next in importance.

**Industry and Trade.** Agriculture is the leading activity of the population, and wheat, barley, and rice are grown in considerable quantities. Irrigation is indispensable even in the northern regions and is a constant concern of the Government. There is an Irrigation Department which operates canal systems, while pumps are worked by private individuals or tribes, irrigating some 800,000 acres. In 1919 the ancient canal, Saqlawiyah near Felliyah on the Euphrates, was reopened for the service of some 70,000 acres in winter and 36,000 acres in summer. Other canals opened after the War were the Yousoufeh to serve Bagdad, the New Khalis from the Dial River, the Beni Hassan, and the Georgivah, both from the Euphrates. Agricultural experiments indicated the feasibility of cultivating cotton, tobacco, and groundnuts. Dates, as always, figure in the economic life of the country, and sheep are tended in the Mosul region. The lack of farm labor and limited funds retard development. Local industries, concerning themselves with tanning and weaving, are to be found in the towns. Into the export trade, dates, grains, carpets, and wool, of the native products, enter largely, while piece goods, carpets, sugar, and tea are re-exported from Bagdad particularly via the caravan routes. Total imports for 1927-28 were valued at 3,455,242 rupees; total exports, 61,540,544 rupees.

**Communications.** River transportation continued to occupy a prominent place even after the War; particularly extensive improvements were made in the Tigris. The navigation of the two rivers is as before, controlled by a British company. Basra was the scene of great harbor developments as well. In 1927, 740 vessels of 3,943,892 gross tons entered this port. Up to 1914, the only railway line was the standard-gauge branch of the Bagdad Railway from Bagdad to Samarra (75 miles). However, military exigencies caused the construction of the following: Basra to Nasiriyah (140 miles), Basra to Amara (109 miles), Kut-el-Amara to Bagdad (105 miles), Bagdad to the vicinity of Khanikin (103 miles), and thence to the Persian frontier. The Bagdad Railway line was extended to Tekrit, and then, after the Armistice, on to Qalat Sharqat (total 186 miles). In all, some 1100 miles of line were built for military purposes. An outstanding event was the opening of the line from Basra to Bagdad (354 miles) in January, 1920, which made possible a comfortable train ride of 22 hours from city to city. The line from Bagdad to the Persian frontier at once

reduced freight rates and thus facilitated intercourse. On Mar. 31, 1928, the total route mileage was 752 with 182.52 miles of siding in addition. Railway earnings for 1927-28 were 9,802,330 rupees and operating expenses 8,546,803 rupees. Bus and airplane services are being rapidly introduced and developed.

**Minerals.** Oil is known to exist in rich quantities north from Mandali to Bagdad. The Anglo-Persian Oil Company obtained concessions to work some of these fields. Wells were sunk at Quaiyarah, but in 1929 the yield was still inconsiderable. Asphalt is found at Hit on the Euphrates.

**Government.** Revenues for 1918-19 were £2,080,000 and expenditures, £1,117,000; for 1926-27 revenues were 56,700,473 rupees and expenditures, 53,071,711 rupees. Customs revenue which forms about half the annual receipts amounted in 1927-28 to 22,929,835 rupees. The British forces stationed in the country are under the control of the Air Ministry. While there is in addition an Iraq Army, comprising 3 cavalry regiments, 2 field batteries and 3 pack batteries, 7 infantry battalions, and technical and depot troops.

**History.** This Turkish province had been a field for Anglo-German imperialist rivalry from about 1899, but in the summer of 1914 secret agreements were reached whereby a compromise disposition of interests was made. The outbreak of the World War, however, preceded and prevented the necessary ratifications. On Mar. 11, 1917, British and Indian troops occupied Bagdad, the capital of Mesopotamia or Iraq. In the occupied area, the British courted the favor of the native Arabs by making concessions to native customs, by tactful treatment of Mohammedan religious interests, and by generous promises to Arab nationalism. After occupying Bagdad, General Maude issued a proclamation inviting the people to participate in the government, so that they might unite with the Arabs of other regions in realizing their political aspirations. Meanwhile, however, by the secret Sykes-Picot Treaty of 1916, Great Britain and France had made an anticipatory division of the spoils, assigning Mesopotamia to Great Britain. The unratified peace Treaty of Sèvres (1920), and likewise the definite Treaty of Lausanne (1923), deprived Turkey of sovereignty over Mesopotamia; and the latter treaty left for future solution the problem whether the Mosul vilayet, reputed rich in oil, should be included in the ceded area. Mosul had been allotted to France by the Sykes-Picot Treaty, but transferred to England by another Anglo-French bargain in December, 1918. At the San Remo Conference of April, 1920, the Allies conferred on Great Britain a Class A mandate over Mesopotamia, including Mosul, though Turkey claimed the latter area on the ground of national self-determination. See MANDATES. At the same conference, an Anglo-French oil agreement was concluded, whereby a 25 per cent share of the future oil output of Mosul was granted to France, and a pipe line was to be constructed through Syria as an outlet for Mesopotamian oil.

Against this oil agreement, the United States government entered a vigorous protest, in a note dated Nov. 20, 1920; at the Lausanne Conference in 1923, the American delegation blocked a British attempt to obtain Turkish confirmation of the predominantly British-Turkish Petroleum Company's monopolistic concession. The contro-

versy regarding the Mosul oil field was further complicated by the Chester Concession and by claims advanced in behalf of Abdul Hamid's heirs. The British oil interests conciliated Washington by offering several American claimants minor shares in Mesopotamian oil. In the meantime, the uncertainty prevailing in regard to the future status of the country had encouraged the development of a strong Nationalist agitation by young Arab officers, who quoted Wilson's speeches and various English and French manifestoes to prove Mesopotamia's right of self-determination. Popular antipathy to the efficiency of British tax collectors, to forced labor on irrigation works, and to British disregard of tribal and religious leaders, provided additional fuel for the smoldering fires of discontent which burst into open rebellion in 1920. The British Army of 60,000 men had to be increased to 90,000 before the revolt was quelled, in December, 1920.

Under these unfavorable circumstances, the British endeavored to create the administrative machinery to fulfill their mandate. In the autumn of 1920, the Council of State was set up, under the tutelage of Sir Percy Cox, the British High Commissioner. Insistent Arab demands for a native government, reinforced by equally insistent protests by English taxpayers against the large military expenditures in Mesopotamia, whose cost, from the Armistice to the end of 1921, was estimated at £100,000,000, led the British government to consider favorably the claims of Prince Feisal, son of the King of Hedjaz. The Council of State on July 11, 1921, unanimously offered him the crown, and after an almost unanimously favorable but hardly democratic plebiscite, 96 per cent for Feisal, he was officially proclaimed King of Iraq, at Bagdad, Aug. 23, 1921. See FEISAL.

From this time on, the British gradually withdrew their forces, the last British battalion leaving in March, 1927. One Indian battalion and five air squadrons of 12 planes each remained, in addition to an Iraq Army of about 10,000 men. The new Kingdom of Iraq, nominally a sovereign state, was nevertheless subject to British supervision under the mandate, and to clarify this relationship, a 20-year treaty was signed on Oct. 10, 1922 (not ratified by Iraq until June, 1924), by which Iraq agreed to be guided by the advice of the British High Commissioner in financial, military, and international matters, and Great Britain promised to facilitate Iraq's entry into the League of Nations, in due course.

A subsequent protocol, signed Apr. 30, 1923, provided that the treaty was to terminate either on the entry of Iraq into the League, or in any case not later than four years after the ratification of peace with Turkey (i.e., 1928).

The independence granted to Iraq was evidently of a very limited nature. The British continued to supervise native administration in the vital departments, a British Civil Administration continued to function temporarily side by side with Feisal's government, and the British Royal Air Force remained in military control of the country. In 1922, to give one instance of British policy, the Minister of the Interior was exiled to Ceylon because of his too pronounced Nationalist views. The constitution, or Organic Law, drafted in 1923, approved by the Council of Ministers, and accepted by the Constituent Assembly in June, 1924, made Mo-

hammedanism the state religion and Arabic the official language, but assured equal civic rights to all, regardless of creed or race. Its political clauses provided the customary machinery of parliamentary government, with a responsible cabinet and a bicameral legislature. This legislative body consists of two Houses, the Senate composed of 20 "Elder Statesmen" appointed by the King, and the Lower House of 88 elected deputies. The first Parliament, with 52 Progressives and 33 Nationalists, met July 16, 1925.

In 1924 the dispute with Turkey over the Mosul frontier was referred to the League of Nations. The League decided in December, 1925, in favor of Iraq, provided England's tutelage of the kingdom were extended 25 years. Accordingly, the new Anglo-Iraq Treaty was signed Jan. 13, 1926, extending the duration of the original treaty of 1922 for another 25 years from Dec. 16, 1925. It was to terminate, however, at any time before its normal expiration, if Iraq became a member of the League.

Throughout 1927, then, there was agitation in Iraq to secure its admission to the League. The Iraq government favored the introduction of conscription, so that it could guarantee the preservation of internal order and protection against foreign aggression. In the fall of 1927, King Feisal and Prime Minister Jafaar Pasha went to London to try to convince the English authorities of the need for conscription and another revision of the treaty. The result was the treaty of December 14, in which Iraq was recognized as an "independent sovereign state." England, furthermore, promised to support her candidature for admission to the League in 1932 if all "things go well in the meantime."

The treaty caused dissatisfaction in Iraq, as did also the new Prime Minister's (Jafaar Pasha) attempt to push through conscription. But Jafaar resigned on Jan. 9, 1928, to be succeeded by Saadun Pasha, who pledged adherence to the treaty and dropped all talk of conscription. In the elections of May, 1928, the Government received 70 seats out of the 88 in the Lower House. On Jan. 21, 1929, Saadun resigned over the question as to whether Iraq should pay part of the cost of the maintenance of the British forces in the land. Toward the end of April, 1929, Tausiq Bey became Prime Minister, the twenty-first in eight years. In a speech to Parliament on May 6, he promised an attempt at speedy settlement of the difficulties with England, a census, reorganization of the army, and attention to such matters as housing, irrigation, and education.

In foreign affairs, Iraq's chief difficulties have been with Nejd and Persia. The Nejd Wahabis were making life miserable for the Iraqis who live near the border, but a conference held between British, Iraq, and Nejd officials toward the end of 1928 was thought likely to improve conditions. Iraqi-Persian difficulties resulted from an attempt of some southern Iraqis to acquire Persian citizenship in order to escape conscription, from a quarrel over the treatment of Persian subjects in Iraq, and from Persia's claim that Iraq is a refuge for Persian bandits and rebels. In April, 1929, however, Persia finally recognized Iraq and relations between the two neighbors are improving steadily. The British High Commissioners in Iraq have been Sir Percy Cox to 1923, Sir Henry R. C. Dobbs from 1923 to 1929, while Sir Gilbert Clayton was appointed in March, 1929.

**IRELAND.** An island of the British Isles with an area of 32,586 square miles. The population in 1911 was 4,390,219. No census was taken in 1921. By the Government of Ireland Act (1920), as amended by the Irish Free State Act (1922), Ireland was divided politically into two parts, Northern Ireland and the Irish Free State. The former remains in the United Kingdom; the latter has constitutional status as a dominion. For statistical information and recent history, consult articles on IRELAND, NORTHERN, AND IRISH FREE STATE.

**History.** On the eve of the World War, which was destined to affect the fortunes of Ireland no less decisively than those of Europe, three-quarters of the Irish population were solidly backing Redmond's Nationalist Party in its agitation for home rule, while the rest, defiantly Unionist, were ready to take up arms against the British government, if need be, rather than permit that government to include Protestant Ulster in an autonomous Ireland. For loyal support of Asquith's Liberal cabinet, the 84 Irish Nationalists in the Commons had been rewarded with the introduction, by the Premier himself, of the Government of Ireland Bill (the famous Home Rule Bill), Apr. 11, 1912, which had been passed by the Commons twice, twice rejected by the peers, and passed a third time by the Commons in the spring of 1914. Under the terms of the Parliament Act, this bill could now be promulgated by the Crown as law, notwithstanding the Lords' veto, but the Prime Minister, moved doubtless by either the threats or the entreaties of the Unionists, decided with characteristic indecision to compromise on a middle course. Accordingly, he introduced an Amending Bill, which would permit the Ulster counties, at their option, to exclude themselves provisionally, for six years, from the proposed Irish government. Feeling ran high, in Parliament and above all in Ireland.

After the English declaration of war on Germany, the Nationalists vied with Ulster Unionists in protestations of loyalty; but when in September, 1914, Premier Asquith decided to put the Home Rule Bill on the statute books, and simultaneously to pass a Suspending Act to suspend it for 12 months, or until the termination of the War, he at once angered Ulster and weakened Redmond's control over the extremists in his party. The organization, known as Sinn Fein ("we ourselves"), led by Arthur Griffith, had originally designed to promote a Nationalist cultural risorgimento, but now republican in aim, organized a separate body of "Irish Volunteers," captured the Gaelic League, spread its anti-British propaganda through hamlet and heath, and prepared for the day of independence. Sinn Fein, however, was still but an active minority when in April, 1916, the Easter Rebellion occurred in Dublin. Members of Irish Volunteers and the Citizen Army seized the Post Office, the Four Courts, and other buildings in the heart of the city, and proclaimed Ireland a republic. British machine guns and field artillery soon compelled the republicans to surrender. Swift and heavy was England's vengeance. Some 3400 men and 79 women were arrested as suspects; Padraic Pearse, Thomas Macdonagh, and 13 others were condemned by court-martial and summarily executed; and about 100 were sentenced to imprisonment, while over 1800 were interned. Sir Roger Casement, who was landed on the Irish

coast from a German submarine on the eve of the rising, was tried for high treason and hanged on August 3. The executions, far from settling the matter, aroused such a storm of indignation on both sides of the Irish Sea that Premier Asquith promised to investigate conditions in Ireland personally. A few days' visit convinced him that the government there had completely broken down, and he accordingly delegated Lloyd George to arrange for the immediate application of the Home Rule Act of 1914; but the negotiations begun by Lloyd George met shipwreck when it became known that the Government had promised Sir Edward Carson the definite exclusion of the six Ulster counties from the act.

When Lloyd George became Premier of Great Britain in December, 1916, he announced that he could not force home rule on any part of Ireland to which it was repugnant, but in May, 1917, he offered either to grant immediate home rule excluding six Ulster counties for five years or to summon an Irish Convention to propose a solution. As the former alternative was unpopular, the Premier succeeded with the second, although Sinn Fein repudiated it in advance.

The Convention was composed partly of elected delegates and partly of Catholic and Protestant clergy, merchants, labor leaders, representatives of Irish parties, and two Irish peers, nominated by the British government; it was to be an inclusive rather than a democratic body. During its protracted deliberations, from July 25, 1917, to Apr. 5, 1918, the economic reasons for Ulster's intransigence figured even more prominently than religious or political factors; and the final report, recommending a united Parliament for Ireland, without control of excise and customs taxes, was passed only by 44 to 29 votes, with Ulster and several Nationalists in the opposition. This report was of course disregarded. For its part, the British government in April, 1918, extended the conscription law to Ireland, heedless of warnings. Thereupon the Nationalists, led by John Dillon, successor of John Redmond, who died in March, walked out of the Westminster Parliament and joined Sinn Fein in a protest against the draft. Sinn Fein, by this time, had become a puissant organization; at its convention in October, 1917, representing 12,000 Sinn Fein clubs with 250,000 members, it had voted a republican constitution for Ireland and elected as President Eamonn de Valera, the only surviving leader of the Easter Rebellion. De Valera was imprisoned in May, 1918, escaped in February, 1919, and spent the years 1919-21 in America, where he won sympathy and raised funds for the "Irish Republic." In the general election of December, 1918, Sinn Fein won 73 out of the 105 seats in the British House of Commons, while the almost defunct Nationalist Party retained only 6, and Unionists filled 26. Considering this victory as a plebiscite for Irish independence, the Sinn Fein M. P.'s, instead of proceeding to Westminster, met at Dublin as the "Dail Eireann" (Irish Assembly), adopted a formal Declaration of Independence in January, 1919, and nominated delegates to the Paris Peace Conference.

The refusal of the Peace Conference to recognize these delegates, and President Wilson's unwillingness to demand their admission, turned Irish and Irish-American sentiment against Wilson, the Peace, and the League, and led



disappointed Sinn Feiners in Ireland to resort to violence as their one remaining weapon. With increasing frequency, attacks were made on the Royal Irish Constabulary, the British troops, and British officials, while British troops began wrecking shops and burning villages by way of reprisal.

Under such disquieting circumstances, Premier Lloyd George persuaded his Parliament to enact, in December, 1920, a new Home Rule Bill, creating separate parliaments and ministries for the six Ulster counties of Northern Ireland and the remainder, inaccurately styled Southern Ireland, with a joint Council of Ireland to harmonize the two. Neither Parliament was to have power to control customs and excise duties, army and navy, treaties, titles, external trade, cables, coinage, trademarks, or religion. Ulster accepted the law forthwith, elected its Parliament in May, 1921, organized its cabinet under Sir James Craig, and was congratulated by King George in person. Southern Ireland likewise held elections in May, but the Sinn Feiners elected by all constituencies except Dublin University were pledged not to accept mere home rule. Encouraged, Sinn Fein intensified the irregular warfare it had been waging against the British and especially against the "black-and-tans," ex-service men enrolled as auxiliary police and clad in khaki with black hats and black armbands. The shooting of British soldiers and constables and seizures of arms by Sinn Fein troops increased, and the burning and pillaging of Irish towns and villages by the British grew more frequent. Sinn Fein courts and police were organized, and "Castle" government, the British government, ceased to have any real functions of administration.

At length, Premier Lloyd George in desperation invited the Sinn Feiners, hitherto regarded as rebels, to negotiate with him. Through the mediation of General Smuts, a "truce" was signed, July 10, 1921. England's offer of Dominion status, at first rejected by de Valera and the Dail Eireann, was ultimately accepted in principle as the basis for a tripartite conference of Sinn Fein, Ulster, and British delegates, October to December, and incorporated in a definite treaty dated Dec. 6, 1921. Article 1 conferred on the Irish Free State the same constitutional status as that of Canada and other dominions. Ireland was to have her own Parliament and an executive responsible to it (Article 1), its own army (Article 8), and, in short, the almost complete independence of a dominion (see BRITISH EMPIRE), but with a strict proviso against religious discrimination (Article 16) and transitional fiscal and naval restrictions (Articles 5-6 and 10). Ulster was permitted either to accept inclusion in the Free State, with local autonomy, or to continue as a part of Great Britain with the Northern Ireland Parliament retaining the rights granted by the Home Rule Act of 1920. Naturally, Ulster chose the second alternative, and the government of Northern Ireland remained precisely as established in 1921. The provisions of the 1920 Act regarding a joint Council for Ireland also remained in force, as a result of Ulster's choice (Article 12).

This treaty, liberal as it was, compared with earlier British offers, failed to placate President de Valera and other Sinn Fein irreconcilables, who still cherished the ideal of a united

independent republic, and bitterly assailed Article 4 of the treaty, requiring members of the Free State Parliament to swear allegiance to King George. On the other hand, Arthur (Griffith), Michael Collins, and other Sinn Fein leaders who had signed the treaty believed it to be as much as could practically be obtained, and persuaded the Dail Eireann to accept it by 64 to 57 votes. De Valera indignantly resigned from the Presidency, to which Griffith naturally fell heir, in January, 1922, and the Southern Irish Parliament formally ratified the treaty. As Great Britain also had ratified, the Free State came into being on January 10; its provisional government, with Michael Collins as Premier, took over Dublin Castle from the British administration and joyfully watched 60,000 British soldiers depart from Ireland. Soon, however, de Valera's uncompromising Republican adherents took up arms against the provisional government, and Ireland was once more in the throes of guerilla warfare. The death of President Griffith on August 12 and the killing of Premier Collins on August 22 by Republicans might well have discouraged the Free State forces, but the latter event seemed to have the contrary effect of arousing indignation against the Republicans. William T. Cosgrave succeeded Collins as head of the Government. Meanwhile, a provisional Parliament favorable to the treaty had been elected in June, and in the autumn, this body adopted a constitution on October 11, making Gaelic the official language of the Free State, guaranteeing personal and religious liberty, and creating the bicameral Free State Parliament (Oireachtas) with the Executive Council or cabinet of ministers responsible to the Lower House. The House of Representatives (Dail Eireann) of 153 members was to be elected for four years, unless dissolved, by universal suffrage of men and women over 21, with proportional representation. The Senate (Seanad Eireann) of 60 members was to be chosen, one-fourth every three years, by a vote of citizens aged 30 and over, with proportional representation, from a list of prominent citizens nominated by the Irish Parliament. The constitution was confirmed by the British Parliament early in December, 1922, and the new Government was at once established; the provisional Parliament now became the first House of Representatives, and the first Senate was chosen, half by the House and half by the President of the Executive Council. Cosgrave became President of the Executive Council, and Timothy Healy was appointed by the Crown as Governor General, an almost purely honorary post.

The Republicans, meanwhile, had proclaimed a rival government, and though obviously in a minority, refused to abandon their irregular warfare against the Free State until thousands had been killed or wounded, 15,000 Republicans imprisoned, and scores executed in reprisal for Republican deeds of violence. In April, 1923, de Valera ordered a truce, in view of approaching elections; he was, however, arrested on August 14, to be subsequently released in the July following. Though large numbers of Republicans were released in course of time, several thousand were held in jail regardless of hunger strikes. By 1924 the country was fairly well pacified, and the Free State government was functioning in an orderly fashion. Elections for the House held on Aug. 27, 1923, had given

the Cosgrave government 63 seats; Republicans, 44; Labor, 15; Farmers, 15; Independents, 16. As the 44 Republicans absented themselves when the new Parliament met in September, the Government had a working majority and addressed itself earnestly to the difficult tasks of extending peasant proprietorship and balancing an unbalanced budget. On Sept. 10, 1923, the Irish Free State was admitted to the League of Nations, and the once despised Gaelic tongue was heard as a national language in the assembly of nations at Geneva. See IRISH FREE STATE.

**IRELAND, JOHN** (1879— ). An English composer, born at Inglewood, Bowden, Cheshire. He was a pupil in composition of Stanford at the Royal College of Music. From 1901 to 1909, he wrote several choral works with orchestra, orchestral works in the larger forms, and much chamber music, all of which he later discarded. His principal works, published after 1909, included a prelude for orchestra, *The Forgotten Rite*; a symphonic rhapsody, *Mai-Dun*; two piano trios; two violin sonatas; a 'cello sonata; pieces for piano; and songs.

**IRELAND, NORTHERN.** The official name of that part of Ireland remaining in the United Kingdom of Great Britain and Ireland. It is made up of the following counties and county boroughs: Antrim, Armagh, Belfast (County borough), Down, Fermanagh, Londonderry, Londonderry (County borough), Tyrone. Its area is 5238 square miles; its population in 1911 was 1,250,531; on Apr. 18, 1926, 256,561. Estimated population on June 30, 1928, was 1,248,000. See GREAT BRITAIN; IRELAND.

**IRIGOYEN, HIPÓLITO** (1850— ). A President of Argentina, who was born in Buenos Aires and entered Congress in 1880. After the Revolution of 1890, he became the leader of the Radical Party and struggled to wrest power from the rich landowners. In 1911 he got a law passed which provided for compulsory and secret voting in elections, and in 1916 he was elected President by two votes, having refused to campaign for himself. In spite of great popular feeling for war with Germany in 1917, he rejected this course because he felt that war would interrupt his labor reforms. In 1922 he retired, as required by law, but in 1928 he was reelected for the term 1928-34, again without campaigning and without a platform, by a two to one vote. He lived simply, refusing to occupy the presidential palace while in office, gave his salary to charity, and was considered almost a prophet by the masses.

**IRISH FREE STATE.** A dominion of the British Empire, with an area of 26,592 square miles and a population, in 1911, of 3,139,688. According to the census of 1926, the population was 2,971,992.

The Irish Free State is essentially an agricultural country. In 1927 there were 4,047,013 cattle, 1,177,737 swine, 3,120,308 sheep, 185,810 goats, 428,502 horses, 197,004 asses, and 19,065 mules. The principal crops are hay, potatoes, oats, turnips, barley, and wheat. The completion of the Shannon River hydroelectric plant in 1929, which was to develop 90,000 horse power, was expected to assist materially in the industrialization of the country. Industries, such as exist, are confined chiefly to the preparation of dairy and meat products, boot and shoe making, and brewing and distilling.

In the calendar year 1927, the exports of the Irish Free State were valued at \$214,701,000

and the imports at \$295,565,000. The adverse trade balance in that year was the smallest in the four years since separate trade statistics had been maintained, imports having declined slightly and exports having gained by nearly \$15,000,000, or 7 per cent, as compared with 1926. Exports in 1926 were valued at \$200,087,000, and imports at \$295,896,000. Great Britain supplied 66.8 per cent of the imports in 1927 and purchased 84.6 per cent of the exports.

The budget for the fiscal year ending Mar. 31, 1929, carried revenues of £22,914,000 and expenditures of £26,080,681. The public debt on Mar. 31, 1927, amounted to £17,074,300. There are approximately 3028 miles of railway line in the country. In 1927, 13,494 vessels of 9,262,000 net registered tons entered the ports of the Free State in the foreign trade, and 13,368 vessels of 9,282,000 tons cleared.

**History.** Outstanding events in the history of the Irish Free State after its establishment were the settlement of the boundary dispute with Northern Ireland in 1925, the rise of Eamonn De Valera's new Republican Party, the Fianna Fail, as the principal opposition party in the Dail Eireann, and the pacification and stabilization of the Free State in the status of a British dominion.

Provision for the settlement of the boundary question by a special commission had been made in the Anglo-Irish Treaty of 1921, but the commission had not been established and the question remained a fertile source of animosity between the people of the Free State and Ulster. Several times civil war appeared imminent. The Free State government laid claim to the counties of Tyrone and Fermanagh in Ulster and several towns along the border in which Roman Catholics were in the majority. The Ulster government, contending that it had no part in the treaty of 1921 and that the six northern counties had been placed within its jurisdiction by the Government of Ireland Act of 1920, repeatedly refused to appoint a representative to the commission.

The commission was finally established in 1924 through the intervention of the British government. The Free State member, Professor John MacNeill, resigned toward the end of 1925, shortly before the report was to have been submitted, asserting that the other two members had failed to respect the provisions of the Anglo-Irish Treaty in their deliberations. It was forecast that the commission would not only reject the Free State claim to the extension of its boundary but would also allot a portion of Donegal to Northern Ireland. At this juncture, the issuance of the report was forestalled by an agreement for the settlement of the dispute which was signed Dec. 3, 1925, after the premiers of both the Free State and Northern Ireland had conferred with Premier Baldwin in London. The agreement amended the treaty of 1921, revoked the powers of the boundary commission, and fixed the boundary permanently as it had been fixed provisionally in the Northern Ireland Act of 1920. The financial obligations assumed by the Free State toward the British government under the Anglo-Irish Treaty were remitted in consideration of the payment of £5,000,000 as compensation for damages done in the Free State area during the Anglo-Irish struggle after Jan. 21, 1919. The agreement was ratified by the British, Free State, and Northern Ireland parliaments but was repudiated by the Irish Republicans.

The refusal of the Republicans originally

elected to the Dail to take the oath of allegiance left the Government without effective opposition until August, 1927, when De Valera and his Fianna Fail deputies decided to accept the oath and take their seats. They announced, however, that they did not consider the oath binding. Fianna Fail was organized by De Valera in January, 1926, when he broke with Sinn Fein over tactical measures for securing the abolition of the oath of allegiance. In the election of July 9, 1927, he doubled his 22 members in the old Dail, largely at the expense of the Sinn Fein Republicans, who lost 18 of 23 seats. The Government, which lost 12 seats, was no longer able to command a majority.

Premier Cosgrave continued in office, however, and was reelected president of the Executive Council. The seating of the Fianna Fail deputies was followed by an attempt to form a coalition government of Labor and National League members with the support but not the participation of Fianna Fail. The defection of one National League deputy saved the Government. Shortly afterward Premier Cosgrave called a new election, which was held September 15. The two main parties gained at the expense of minor groups, the Government and Fianna Fail winning 61 and 57 seats, respectively. With the aid of the Farmers' Group and the Independents, the Government continued with a small but safe majority over Fianna Fail and Labor during 1928 and most of 1929. In the latter year in several important by-elections, Government candidates defeated their Fianna Fail opponents. While denying sympathy with a wave of political terrorism which swept the country early in 1929, De Valera and his chief lieutenants declared that violence would probably continue as long as candidates for the Free State Parliament were required to take the oath of allegiance to the British King.

Internal peace was disturbed early in 1924 by a mutiny led by officers in protest against the reorganization and reduction of the Free State Army. The Government failed to deal firmly with the situation and in the following December was obliged to discharge a number of soldiers and civil servants who had continued the agitation. Republican raids upon police barracks and rioting occurred again in November, 1926, apparently as a result of the Government's participation in the British Imperial Conference held at that time. The Public Safety Act, establishing a virtual state of siege, was put into effect in the affected districts, some fifty arrests were made, and the disturbances quickly subsided.

On July 10, 1927, at the conclusion of the bitter political campaign, the country was aroused by the assassination of Kevin O'Higgins, vice president of the Executive Council, by three men believed to be agents of an unknown secret society. The Government adopted drastic measures against political crime, including the death penalty for the carrying of arms. After an interval of peace these were repealed in December, 1928. In October of that year, a few days before Princess Mary paid a visit to her husband's estate at Portunna, County Galway, incendiaries attempted unsuccessfully to burn Portunna Castle. There was a revival of political terrorism early in 1929; jury members were threatened, injured, and murdered and armed guards were assigned to protect the members of the Government. The Government again adopted severe measures and appealed for popular support but barely carried a

by-election in North Dublin fought on this issue.

Early in 1928 Premier Cosgrave visited the United States and Canada and was enthusiastically received. The same year Government spokesmen declared that the cabinet did not favor an Irish republic, believing that greater freedom and security could be found within the British Commonwealth of Nations. Governor General Timothy M. Healy resigned in December, 1927, after completing his five-year term, and was succeeded by James McNeil, Free State High Commissioner in London. Timothy Smiddy, Free State Minister at Washington, was then appointed High Commissioner in London, being replaced at Washington by Michael McWhite. The Free State was one of the original signatories of the Kellogg-Briand Treaty for the renunciation of war and the pact was ratified by the Dail on Feb. 22, 1929, although opposed by members of the Fianna Fail. In August, 1929, Charles Bewley, of Dublin, was appointed the first diplomatic representative to the Vatican City.

**IRON AGE.** See ANTHROPOLOGY.

**IRON AND STEEL.** Since 1913 the iron and steel industry of the world has furnished a notable illustration of the intimate relation of the development of natural resources and modern industrial activity to the maintenance of conditions of civilization. The importance of iron and steel manufactures to modern civilization was generally realized before the World War, but if any further proof were needed, it was found in the demands made on these industries during the great struggle. The forced operation of the iron and steel industries on a war basis, and the possession of raw materials for these industries was naturally an important military asset. After the Armistice, France secured the return of the valuable iron basin in Lorraine. As a result, the importance of France as an iron- and steel-producing nation has shown an appreciable relative increase.

A feature of the European iron and steel trade during the post-war period has been the general adoption of the cartel idea of production control and, within the individual nations, the widespread tendency toward industrial rationalization. Despite the loss of important raw-material-producing regions in the geographic and economic readjustments that followed the War, Germany was in some respects in better position than either France or Belgium, whose industrial plants were, in large part, within the zone of operations, and required complete rehabilitation.

The United States has been the leading producer of iron and steel for many years. In 1913 the world's production of pig iron was 77,174,000 long tons, of which the United States produced 30,653,000 tons; Germany, 19,000,000; Great Britain, 10,260,000; France, 5,126,000;

#### UNITED STATES PRODUCTION OF PIG IRON AND STEEL, 1916-28

Year	Pig iron	Steel ingots
	Gross tons	Gross tons
1916	39,432,797	42,773,680
1917	38,621,216	45,060,607
1918	39,054,644	44,402,432
1919	31,015,364	34,671,232
1920	36,925,987	42,132,934
1921	16,688,136	19,783,797
1922	27,219,904	35,602,926
1923	40,361,000	44,943,700
1924	31,405,800	37,931,900
1925	26,700,500	45,393,500
1926	339,101,000	48,294,000
1927	30,289,000	44,935,000
1928	37,400,000	51,544,180

and Russia, 4,536,000. In 1921 the world's production of pig iron was only 37,401,000 long tons, of which the United States produced 16,500,000; France, 9,890,000; Great Britain, 6,630,308,000; Great Britain, 2,616,000; and Russia, 112,000. A new world-production record was established in 1928, when the output totaled 86,130,000 long tons. Of the 1928 total, the United States produced 37,400,000 tons; Germany, 11,500,000; France, 9,890,000; Great Britain, 6,630,000; Belgium, 3,815,000; and Russia, 3,290,000.

The production of steel ingots and castings has shown a much greater increase since 1913 than that recorded by pig iron. In 1913 the world's production of steel ingots and castings amounted to 74,687,000 long tons. The leading contributors to this total were the United States with 31,301,000 tons; Germany, with 18,632,000; Great Britain, 7,664,000; France, 4,614,000; and Russia, 4,181,000. In 1928 the leading contributors to the record output of 107,210,000 long tons were the United States, with 51,400,000 long tons; Germany, 14,000,000; France, 9,170,000; Great Britain, 8,495,000; Russia, 4,150,000; and Belgium, 3,865,000.

In Great Britain, the failure of the iron and steel industry to assume a position of relative importance in the world trade similar to that held prior to the War has been a great disappointment. The general strike of 1926 naturally resulted in a decrease in productive operations in the iron and steel industry of Great Britain,

BRITISH IRON AND STEEL OUTPUT AND EXPORTS DURING PEACE YEARS  
(In Gross Tons)

Year	Pig iron	Steel	Exports
1912	8,748,000	6,792,000	4,807,200
1913	10,260,000	7,688,000	4,969,200
1919	7,404,000	7,896,000	2,223,200
1920	8,034,000	9,067,200	3,250,800
1921	2,611,200	3,625,200	1,706,400
1922	4,899,600	5,880,600	3,400,800
1923	7,440,000	8,481,600	4,320,000
1924	7,318,800	8,221,200	3,852,200
1925	6,236,400	7,396,800	3,730,800
1926	2,441,500	3,497,000	2,987,700
1927	7,320,000	9,170,000	4,220,000
1928	6,630,900	8,542,000	4,205,000

for not only was the industry directly affected by the walk-out but it was indirectly affected for several months after the general strike ended by the continued unsettled conditions in the coal industry. The immediate result of this stopping of production was to throw open the domestic market to continental steel, which, imported in unprecedented tonnages during and immediately after this period was, of course, exceedingly difficult to dislodge once it had attained an extensive foothold. Exports of iron and steel products from the British Isles reached their highest point since the War in the 1927 trade—a circumstance due, no doubt, to the intensely stimulated production accomplished in the early months of the year and to the presence of a number of orders held over from 1926 which the British steel makers had been unable to fill over the duration of the coal strike.

In 1928 the leading political and industrial factors apparently began to realize that the condition would be permanent unless corrective measures were taken within the industry. Consequently, steps were taken to reduce operating and manufacturing costs, numerous consolidations were reported and, as unfavorable trade barriers and foreign tariffs took more and more from the British export trade, agitation and propaganda for a tariff to protect the home trade

was started. Early in 1929, it seemed inevitable that some step in this direction would be taken.

The German iron and steel industry reported that iron and steel production costs have grown substantially since 1923 and 1924, so much so that in 1928 they practically balanced the economies attained by the rationalization of the industry. A favorable report of the reparations committee, meeting in Paris in the early months of 1929, seemingly was needed to assure any marked future expansion or prosperity for the German industry. An appreciable decrease in production was recorded in 1928, as compared with 1927, largely accounted for by the labor disturbances resulting in a lockout in the Rhenish-Westphalian district late in 1928. These differences were patched over and productive operations were resumed at the beginning of 1929, but the fundamental controversial point remained unsolved and it seemed likely that further disturbances might be expected.

The iron and steel industries of France and Belgium have experienced steady growth since the Armistice. In considering this record, however, it should be remembered that France gained vast resources from Germany at the close of the War. On the other hand, many of the existing plants in France and in Belgium were razed by the Germans during the period of hostilities and, as a result, post-war reconstruction was expensive and time-consuming. The improvement in operating conditions is largely attributable to the control to which continental iron and steel makers have submitted themselves with respect to production. Industrialists in France and in the neighboring countries also have adhered to a number of agreements with regard to the sales of their products in their respective countries that did something toward removing barriers between continental nations owing to the complicated tariff system.

**United States Iron and Steel Industry.** Despite the fact that a vast excess of capacity for iron and steel production and manufacturing had been developed in the domestic industry during the War, the larger corporations in the trade made a practice of turning back large shares of their profits into additions to plant equipment up to 1927. The advisability of this procedure seemed highly questionable at the time, but the great increase in consumption recorded in 1928 and 1929 utilized, in large part, all the existing production capacity.

A feature of the domestic industry since the War has been the numerous mergers and consolidations, so that, in 1928, over 90 per cent of the entire ingot production of the United States was controlled by 10 companies. About 45 per cent of the entire capacity is controlled by the United States Steel Corporation, with the Bethlehem Steel Corporation next, with slightly over 15 per cent. The Youngstown-Inland interests, a consolidation not entirely completed by 1929, is next in size with about 10 per cent, and Jones & Laughlin follow with about 6 per cent. Other companies of the first 10 are the Republic-Trumbull companies, American Rolling Mills Company, Central Alloy Steel Corporation, Wheeling Steel Corporation, Colorado Fuel & Iron Co., and the Corrigan, McKinney Steel Company.

The year 1928 was a remarkable one for the steel industry in the United States, remarkable for its high production rate, in the stability of the market under increased output, in a steady

UNITED STATES PRODUCTION OF STEEL INGOTS AND CASTINGS  
 (By Processes)

Year	Basic	Open-hearth Acid	Total	Bessemer	Crucible	Electric	Miscella- neous	Total Gross tons
1914	16,271,129	903,555	17,174,684	6,220,846	89,869	24,009	3,522	23,513,030
1915	22,308,725	1,370,377	23,679,102	8,287,213	113,782	69,412	1,527	32,151,036
1916	29,616,658	1,798,769	31,415,427	11,059,039	129,692	168,918	604	42,773,680
1917	32,087,507	2,061,286	34,148,893	10,479,960	126,716	304,543	495	45,060,607
1918	32,476,571	1,982,820	34,459,391	9,376,236	115,112	511,364	329	44,462,432
1919	25,719,312	1,229,382	26,948,694	7,271,562	63,572	384,452	2,952	34,671,232
1920	31,375,723	1,296,172	32,671,895	8,883,087	72,265	502,152	3,535	42,132,934
1921	15,082,564	507,238	15,589,802	4,015,938	7,613	169,499	945	19,783,797
1922	28,387,171	921,812	29,308,983	5,919,298	28,606	346,039	....	35,602,926
1923	34,665,021	1,234,636	35,899,657	8,484,088	44,079	515,872	....	44,943,696
1924	30,719,523	857,827	31,577,350	5,899,590	22,473	432,526	....	37,931,939
1925	37,087,342	947,146	38,034,488	6,723,962	19,562	615,512	....	45,393,524
1926	39,653,315	1,038,664	40,691,979	6,934,568	15,496	651,723	....	48,293,763
1927	37,144,268	924,067	38,068,335	6,191,727	9,036	666,087	....	44,935,185
1928	43,200,483	913,473	44,113,956	6,620,195	7,769	802,260	....	51,544,180

ness of demand which permitted an unusually uniform and thus more economical operation of mills, and finally in the almost unprecedented scale of steel output in the summer months. Rated in figures, 1928 was an 86 per cent production year, while 1927 was a 75 per cent year, and 1926 was an 81 per cent year. A new record in steel output featured the year despite the poor railroad demand.

In an effort to surmount barriers set up by the abolition of Pittsburgh plus, steel producers took greater advantage of water transportation in 1928. Among the unusual cross movements were shipments of steel from Buffalo to Chicago and Detroit by the Great Lakes; transportation of wire products from Pittsburgh to Minneapolis via the Ohio and Mississippi rivers and heavy loadings of pipe and other products from Pittsburgh mills to Memphis and New Orleans.

*Iron ore produced in 1927.* The iron ore mined in the United States in 1927, exclusive of ore that contained 5 per cent or more of manganese in the natural state, was, according to the U. S. Bureau of Mines, 61,778,000 gross tons, a decrease of 9 per cent as compared with that mined in 1926. The ore shipped from the mines in 1927 is estimated at 61,232,473 tons, valued at \$151,125,820, a decrease of 12 per cent in quantity and of 13 per cent in total value, as compared with the figures for 1926. The average value of the ore per gross ton at the mines in 1927 was estimated at \$2.47; in 1926 it was \$2.51. The stocks of ore at the mines, mainly in Michigan and Minnesota, increased from 9,565,880 tons in 1926 to 10,104,673 tons in 1927.

About 83 per cent of the iron ore shipped in 1927 came from the Lake Superior district, in which 52,357 gross tons were mined and 51,183,000 tons were shipped. The ore shipped in 1927 was valued at \$130,453,000. The ore is chiefly hematite. The average value of the ore at the mines in the Lake Superior district in 1927 was \$2.55 a ton; in 1926 it was \$2.56. The southeastern States, which constitute the second largest iron-ore-producing area, including the Birmingham and Chattanooga districts, mined 6,455,061 gross tons of iron ore in 1927, a decrease of 6 per cent, as compared with 1926. It is mainly hematite and brown ore. The average value of the ore produced in these States in 1927 per gross ton was \$2.04; in 1926 it was \$2.07.

The northeastern States, which include the Adirondack district, New York, and the Cornwall district, Pennsylvania, in 1927 mined 2,248,000 tons of iron ore and shipped 2,269,000 tons valued at \$7,649,000, increases of 16 per cent in quantity mined, 16 per cent in quantity shipped, and 19 per cent in value of shipments, as com-

pared with 1926. The stocks of iron ore in this group of States decreased from 403,742 tons in 1926 to 366,000 tons in 1927. These stocks are considerably less than usually carried over at these mines, being about 201,000 tons below the average for the preceding five years. The average value of the ore in these States in 1927 per ton was \$3.37; in 1926 it was \$3.28.

The Western States that ordinarily produce iron ore named in the order of their importance are Wyoming, Utah, New Mexico, Colorado, Montana, and California. Occasionally, Idaho, Nevada, and Washington contribute small quantities. All the ore from Wyoming, New Mexico, and Colorado and most of that from Utah is used for the manufacture of pig iron. Much of the remainder is used as a flux in smelting copper and lead ores. Reliable estimates indicate that the Western States mined and shipped in 1927 approximately 1,007,000 tons of iron ore, valued at \$1,523,000. The ore comprises hematite, magnetite, and brown ore.

 IRON ORE SHIPPED FROM MINES  
 BY STATES (U. S. Bureau of Mines)

State	1927		1928	
	Gross tons	Value	Gross tons	Value
Alabama	6,508,419	\$12,973,597	6,159,863	\$11,599,176
Colorado	32,206	(*)	52,713	(*)
Georgia	50,312	147,068	73,952	209,877
Michigan	14,532,831	37,135,364	14,241,102	37,039,644
Minnesota	35,563,177	87,935,099	38,129,018	94,258,899
Missouri	78,805	315,670	94,899	377,847
Montana	2,337	10,156	1,640	5,900
New Jersey	202,720	860,393	350,616	1,357,877
New Mexico	214,747	(*)	184,623	(*)
New York	936,850	4,568,224	767,743	2,906,055
No. Carolina	32,528	81,753	.....	.....
Pennsylvania	1,124,683	2,559,196	1,013,791	2,411,114
Tennessee	121,220	274,620	128,478	286,524
Utah	222,879	(*)	320,655	(*)
Virginia	66,897	172,877	27,970	83,114
Washington	550	(*)	1,012	(*)
Wisconsin	937,935	2,567,078	1,394,371	3,700,797
Wyoming	602,877	(*)	491,240	(*)
Undistributed	(b)	1,524,005	.....	1,551,833
	61,232,473	151,125,820	63,432,826	155,788,657

\* Included under "Undistributed."

b Includes value for States entered as (\*) above.

As is generally known, the ore after being mined is transported to blast furnaces where it is made into pig iron. A part of the pig iron is utilized in the production of rolled and



wrought-iron products, and for the manufacture of castings in iron foundries. The greater part, however, is utilized in the making of steel by the open hearth, Bessemer, electric, and crucible processes, which produce ingots, blooms, billets, bars, and slabs which are then rehandled by the rolling mills, forges, and presses, by which various products such as rails, sheets, pipe, etc., are derived. The proportion of iron ore to be treated by one or more of the various methods of beneficiation in common use continues to increase. In 1927, for example, about 38 per cent of the ore shipped from the Mesabi Range of Minnesota was beneficiated; most of this was crushed merely, a lesser amount than usual was washed, some was dried, and none was magnetically separated.

tures, \$83,662,000 of steel mill products classed as finished manufactures, \$82,558,000 of advanced manufactures, excluding machinery and vehicles, and \$861,000 of ferro-alloys. Imports of iron and steel semi-manufactures and of steel-mill products in 1928 were valued at \$28,174,000, a slight decrease from 1927, while advancing iron and steel manufactures imported totaled \$8,835,000, an increase of 23 per cent over the 1927 total. Ferro-alloying materials valued at \$13,886,169 were imported in 1928, as compared with \$10,440,003 in 1927. The most important raw material imports were iron ore, \$5,428,000; manganese ore, \$5,396,000; ferro-manganese and other manganese alloys, \$4,806,000; chrome ore or chromite, \$1,705,000. Pig iron, structural shapes and building forms, steel bars, iron and

TOTAL UNITED STATES PRODUCTION OF ALL KINDS OF FINISHED ROLLED IRON AND STEEL 1914-28

Year	Iron and steel rails	Plates and sheets	Nail plate	Wire rods	Structural shapes	All other finished rolled	Total Gross tons
1914	1,945,095	4,719,246	88,573	2,431,714	2,081,124	7,204,444	18,370,196
1915	2,204,203	6,077,694	31,929	3,095,907	2,437,003	10,546,188	24,392,924
1916	2,854,518	7,453,980	30,088	3,518,746	3,029,964	15,493,093	32,380,389
1917	2,944,161	8,267,616	22,864	3,187,188	3,110,000	15,585,921	33,067,700
1918	2,540,892	8,799,135	18,810	2,562,390	2,849,969	14,385,058	31,155,754
1919	2,203,843	7,872,814	12,832	2,538,476	3,614,036	10,359,543	25,101,544
1920	2,604,116	9,337,680	20,577	3,186,907	3,306,748	13,941,835	32,347,863
1921	2,178,818	4,260,574	14,573	1,564,330	1,272,624	5,483,087	14,774,006
1922	2,171,776	7,968,397	21,969	2,654,741	2,718,768	10,916,353	26,452,004
1923	2,904,516	9,497,717	22,833	3,075,892	3,405,197	14,370,921	33,277,076
1924	2,443,332	8,087,833	22,175	2,522,545	3,283,708	11,786,792	28,086,435
1925	2,785,257	9,807,659	22,038	2,844,656	3,604,130	14,323,220	33,386,960
1926	3,217,649	10,529,056	17,337	2,722,032	3,911,663	15,098,155	35,495,892
1927	2,806,486	9,627,784	18,051	2,770,271	3,742,445	13,914,044	32,879,031
1928	2,647,493	11,006,050	16,200	3,080,816	4,096,143	20,846,702	37,662,916

*Imports and Exports.* The imports of foreign iron ore into the United States in 1928 were 2,452,646 gross tons against 2,620,717 tons in 1927, and 2,190,697 tons in 1925. Over 75 per cent of all the imported ore came from the Bethlehem Steel Corporation mines in Chile and Cuba and was consumed at their plants. Most of the balance of the imported ore came from Northern Africa and Sweden. The exports of iron ore in 1928 amounted to 1,282,306 gross tons, as compared with 898,793 tons in 1927, and 630,521 tons in 1925.

As in the other years, practically all export iron ore was shipped to Canadian furnaces. The exports of iron and steel products from the United States in 1928 were 2,889,546 tons, or 687,577 tons greater than they had been in 1927, while the imports at 774,213 tons were higher than the previous year by 52,438 tons. The increase in exports over 1927 was generally reflected by the trade as a whole and, as in former years, the bulk of the exported iron and steel products was taken by Canada. Japan was the next largest purchaser of steel, followed by China, Argentina, and Italy.

The total tonnage of imports of iron and steel products in 1927 decreased almost 25 per cent from that of 1926; in 1928 imports increased slightly in tonnage over 1927. Belgium attained the lead in export of iron and steel to the United States during 1927, with 209,126 tons; followed by France, with 132,878; and Germany, with 129,103. These three countries shipped about 63 per cent of the iron and steel imported into the United States.

In 1928 the total value of iron and steel exports was \$267,872,000, as compared with \$238,379,000 in 1927, \$189,255,000 in 1922, \$663,280,000 in 1920, and an average of \$139,440,000 in 1910-14. Of the 1928 total, \$4,798,000 consisted of iron ore, \$95,993,000 of semi-manufac-

steel scrap, cast iron pipe, and manganese alloys in the order named provided the largest tonnage among imports. The bulk of the exports consisted of iron and steel scrap, structural steel, steel sheets, rails, tin plate, piping, steel bars, pig iron, and skelp iron or steel.

An important development in 1928 was the beginning of a joint effort, on a large scale, to develop American foreign trade in iron and steel. To cultivate markets abroad more effectively, the United States Steel Corporation joined with the Bethlehem Steel Corporation to form a common export organization, the Steel Export Association of America, thereby providing a single outlet for 75 to 80 per cent of the rolled steel shipped out of this country.

*Electric Steel.* Prior to 1913, only two or three countries made any electric steel. As early as 1908 and 1909, steel was being produced in electric furnaces, particularly in Germany and France, and in the United States. In 1913 when the industry first really attained any magnitude, Germany was easily the leader. The peak in production up to and including the close of the War was in 1918, when 1,149,600 tons were produced.

In 1913 Germany produced over 50 per cent of all the electric steel made in that year. In 1925 the German production was less than 12 per cent. In Italy, the electric-furnace steel industry has expanded about 300 per cent in the period since the War. Japan has shown about the same percentage of growth. In Sweden also, large gains have been made though the country's industry as a whole has not yet regained its pre-war volume in either pig iron or steel.

A satisfactory and complete up-to-date statistical review of the electric-furnace steel industry for the last few years is impossible, as adequate information is not available. However, it is known that the electric-steel industry

in the United States is growing more or less in direct proportion with the iron and steel industry as a whole. In 1927, for example, the production of electric steel in the United States totaled 666,087 long tons of which 371,278 tons were ingots, and 294,809 tons were castings.

**Working Conditions.** The long hours which had prevailed in the iron and steel industry for certain classes of labor were almost completely abolished by the end of 1923. President Harding was perhaps the leading factor in securing this change. The principal objection against making the change had been the probability of a shortage of labor. When the change from the two- to the three-shift day was actually placed in effect in 1923, conditions were quite favorable to making the change, as most of the plants were not operating at capacity, and consequently, though there was a shortage of labor, it was not a preponderating condition in the industry. Since the change became operative, its effect has been most apparent. In the last few years, considerable work has been done along the lines of mechanizing operations in the hope of cutting costs, but the high rate of productive operations has obviated the possibility of an unemployment problem. General conditions among the industry's labor appear to be highly satisfactory.

**IRRIGATION.** See DAMS; RECLAMATION.

**IRWIN, WALLACE** (1876– ). An American humorous writer, born at Oneida, N. Y., brother of William Henry (Will) Irwin. He studied at Leland Stanford, Junior, University, 1896–99, and became editor of the *Overland Monthly Magazine* in 1902. As a writer of burlesques and topical verse, he drew wide attention, especially by *The Love Sonnets of a Hoodlum* (1902). Other successes soon followed, including *Nautical Tales of a Landsman* and *At the Sign of the Dollar* (1904), and *Chinatown Ballads* (1905); but the most widely cited of his writings was the humorous series of papers dealing with an imaginary Japanese youth called Togo and collected as *Letters of a Japanese Schoolboy* (1909) and *Mr. Togo, Maid of All Work* (1913). Among his later books may be mentioned: *Pilgrims into Folly* (1917); *Venus in the East* (1918); *The Blooming Angel* (1919); *Suffering Husband* (1920); *Seed of the Sun* (1921); *More Letters of a Japanese Schoolboy* (1923); *Lew Tylor and the Ladies* (1928).

**IRWIN, WILLIAM HENRY (WILL)** (1873– ). An author and war correspondent, born at Oneida, N. Y., brother of Wallace Irwin. He graduated at Leland Stanford, Junior, University in 1899 and was on the staff of the *San Francisco Chronicle* in 1901–04, and of the *New York Sun*, 1904–06, and managing editor of *McClure's Magazine*, 1906–07. After 1908 he was mainly engaged in writing for the magazines. During the World War, he was with the Allied Armies as correspondent for the various American periodicals, 1914–15, and for the *Saturday Evening Post*, 1916–18. Among his books may be mentioned: *The Hamadryads* (verse, 1904); *The City That Was* (1907); *Old Chinatown* (1908); *Confessions of a (Jon) Man* (1909); *The Readjustment* (1910); *Where the Heart Is* (1912); *Men, Women, and War* (1915); *Latins at War* (1916); *The Thirteenth Chair*, a play, with Bayard Veiller (1916); *A Reporter at Armageddon* (1918); *The Next War* (1921); *Christ or Mars?* (1923); *Highlights of Manhat-*

*tan* (1927); *Herbert Hoover: a Reminiscent Biography* (1928); and *The House That Shadows Built* (of Adolph Zukor and the motion-picture industry, 1928).

**ISHERWOOD SYSTEM.** See SHIPBUILDING.

**ISMET PASHA** (1884– ). A Turkish soldier and Prime Minister, born in Smyrna. He served in the Turkish Armies throughout the World War, rising to the rank of corps commander, and in 1920–22 was commander-in-chief of the Western Turkish Army in Asia Minor which routed the Greeks. He was Turkish delegate to the Mudania Conference in 1922 and in 1923 was chief of the delegation to the Lausanne Conference. He was successful in negotiations there and shortly after his return was named Prime Minister, serving through 1924. He again became Prime Minister in 1928. He is president of the People's Party, a radical, nationalist, protectionist party founded by Kemal Pasha in 1923. The abolition of the caliphate and of the sultanate took place during his first term as Prime Minister. See **TURKEY**, under *History*; **CALIPHATE**.

**ISOSTASY.** See **GEOLOGY**.

**ISOTOPEs.** See **CHEMISTRY**; **PHYSICS**.

**ITALIAN LITERATURE.** A retrospective glance cast over Italy from the dawn of the twentieth century up to the present time discloses, first of all, a loosely organized but courageous government struggling to lay the foundations to a nationalistic régime which resulted in a conscious and intensified nationalism during the World War, and culminated eventually into aggressive nationalism striving for recognition on a par with the leading nations of Europe. Parallel with the political and national readjustment is the development of philosophical thought which is constructed to a marked degree along a "nationalistic consciousness." Contemporary thought finds its impetus in the historical idealization or neo-idealism of Benedetto Croce which in turn gives rise to "activism" and reaction. What characterizes all the branches of Italian thought since 1900 is an evident self-assertiveness gained through the careful examination of its social, political, and intellectual life. We might call it a period of re-orientation and reconstruction of its historical, traditional, and intellectual heritage.

If the first 15 years of the twentieth century in Italian literature were distinguished by the development of Crocean thought, we may say that the following years were dominated by Benedetto Croce and by the men, such as Giovanni Gentile, who either continued and perfected his philosophy or reacted against it. Croce's most novel and influential ideas were in the field of aesthetics, which, furthermore, he approached from the angle of literary criticism. His *Philosophy of the Spirit* had had the effect of making virtually all educated Italians under 45 years of age amateur philosophers and professional literary critics. At any rate, the balance of literary production was shifted in the later years in the direction of "thought" and away from what might be called "creation."

The typical Italian experience had been that of Giovanni Papini, as portrayed in his autobiographical confessions published in 1912, *Un uomo finito* (*The Failure*). This is a record of a strenuous philosophical life. The problem of the young man is to find his place in the universe, acquire a satisfactory solution of the

questions that life puts to him. The mood is one of passionate research, with ups and downs of exalted hope and anguished disillusionment. What distinguishes the European mind in general and the Italian in particular from a common American outlook on life is the sense of individual impotence before the weight of tradition, the feeling of being caught in an unescapable fixity. The young Italians had made and were making frontal attack on this situation. The yearning for freedom, in Papini among others, takes on violent and almost incoherent forms; and it furnishes the motive for much of that thinking of a neo-idealistic character which, inspired by Croce and perfected by Gentile, is fashionably known as "activism."

This is one characteristic that tends to separate the young from the old, the new from the old, in Italian literature; a gap, or rather a rift more or less perceptible, of which the War is made to serve as an unsatisfactory marker. The men who came forward in the decade proclaimed their denial of the "three crowns" of the generation preceding: of Carducci, of Pascoli, of d'Annunzio—we may even add Fogazzaro. It is a denial, one must understand, not so much of these masters themselves, as of their followers and imitators, and of the influence, tending to express itself in precept, which they exert on the future.

The spirit of revolt is variously formulated. The young poets (conveniently presented in Olindo Jacobbe's anthology *Le più belle pagine dei poeti d'oggi*—The Poets of Today) raise the standard of "pure art"—an art that is pure impression, pure image, pure "intuition" (to use a Crocean phrase), as distinguished from the art of Carducci, which is thought of as "parasitically exploiting" various practical emotions engendered by the liberal and national risorgimento. Carducci, in fact, expresses in poetical form an ideal of Italian citizenship; and he glorifies the Italian past to sustain that ideal of citizenship. How much of his fame does the poet owe, therefore, to his morality and how much to his poetry? The indictment of Carducci was drawn, curiously enough, by a critic who had stood aloof from the Crocean tradition and had even been scorned by the young men for his fogynism: by Enrico Thovez, a Piedmontese writer, author of *Mimi dei moderni* (Mimes of the Moderns), *Il pastore, il gregge e la zampogna* (The Shepherd, the Flock, and the Reed), *Il viandante e la sua orma* (The Trail of the Wayfarer), *L'arco d'Ulisse* (The Bow and Quiver of Ulysses), and various volumes of verse.

The poets who may be taken as objectifying this reaction are, among others, Sergio Corazzini (1887-1907), author of *Liriche* (Lyrics); Ettore Cozzani, author of *Orazione ai giovani* (An Address to Youth), *La siepe di emeraldo* (The Emerald Hedge), *Le sette lampade accese* (The Seven Lighted Lamps), and other things; Aldo Palazzeschi, author of *I cavalli bianchi* (The White Horses), *Lanterna* (The Lantern), *L'incendiario* (The Incendiary), and a famous whimsical romance, *Il codice di Perelà* (The Code of Perelà); Corrado Govoni, author of 11 volumes of verse, and in the later years of novels and short stories; Luciano Folgore, a Futurist, and Guido Gozzano (1883-1916), who, with Corazzini, was regarded as among the greatest of these. No review of Italian poetry could, of course, omit Filippo Tomaso Marinetti, author of *Mazurka*, of a play, *Il tamburo di fuoco* (The

Fiery Drum), and various manifestoes of Italian futurism of which he was founder and publicity agent.

In prose writing, "activism" expressed itself as a kind of anti-d'Annunzianism—a preference for "substance" as against "rhetoric," for "things" as against "words," d'Annunzio being taken as a symbol for "rhetoric" and "words." A keen contemporary critic, Adriano Tilgher, had pointed out that d'Annunzio's sensual dilettantism, with its passionate affirmation of the autonomy of the individual spirit, is really closer to the new moods of the Crocean era than had been supposed. In fact, d'Annunzio is the man who connects this later period with its roots in the old romanticism. However, both the kind of life that d'Annunzio seemed to exemplify, and his florid, splendidous, gold-dripping sentence no longer pleased. The younger men set up the plain, solid, meaty novels of Giovanni Verga (1840-1922, author of the cycle called *I vinti*—The Vanquished) as a better expression of the Italian literary ideal; just as they leaped over Fogazzaro to go back to Manzoni, to find a congenial expression of a religious ideal. As significant of the changing trend as these "revivals" are one or two rehabilitations of living men: of Alfredo Panzini (born 1863) who reached maturity in the Carduccian spirit, but won the favor of the young men (his best novel, *Il padrone sono io!*—The Boss? That's me!); and of Luigi Pirandello, whose *Il fu Mattia Pascal* (The Late Mattia Pascal) sold to 2000 copies in 20 years, and later to 100,000 in five years.

Not that the young men produced much that is truly exceptional in the field of the novel. The closest approach to an artistic sensation was the *Filippo Rubé* (Rubé) of the critic-scholar-poet-journalist, G. A. Borgese, who reviewed the pre-Fascisti period of Italian reconstruction in the manner of Stendhal and with something of the sweep of imagination with which Stendhal, a century before, reviewed post-Napoleonic reconstruction. But the promise of *Rubé* was hardly kept in Borgese's subsequent *I vivi e i morti* (Living and Dead). So a temporary excitement welcomed Gino Rocca's *L'uragano* (Hurricane). Much was expected from Rosso di San Secondo after the collection of tales called *Ponentino* (West Wind); but apart from a certain lubricious perversity in *Le donne senza amore* (Women without Love) and some pretty pages in *La fuga* (Flight), his novels had proved in no sense as interesting as his plays (see below).

Some faithful workers and accomplished technicians came forward in the latter years: Marino Moretti, in, for example, *La voce di Dio* (The Voice of God), *I puri di cuore* (The Pure of Heart), and *Il trono dei poveri* (The Kingdom of the Poor); Mario Puccini, in *Dov'è il peccato è Dio* (The Miracle); Salvatore Gotta, in *Il figlio inquieto* (The Restless Child); Corrado Govoni, more famous as a poet, in *La terra contro il cielo* (Earth Against Heaven); and Virgilio Brocchi, in *Il posto nel mondo* (His Place in the World), and *Il sapore della vita* (A Taste of Life) which is a departure from the author's optimistic view on life.

For the rest, the public that reads for amusement continued to depend upon older writers of established reputation who had not indulged to any great extent in poses of novelty: Luciano Zuccoli, in two of his best things, *L'amore di*

*Loredana* (The Love Affair of Loredana), and *Le cose più grandi di lui* (Things Bigger Than He); Grazia Deledda, in *Il dio dei viventi* (The God of the Living), and *Annalena Bilsini* (Country Folk). Deledda is enjoying a real eminence in her declining years; she was awarded the Nobel Prize in 1926; Antonio Beltramelli, whose patient studies among the customs of Romagna gained a certain actuality from the triumph of Mussolini, a Romagnolo—see *Gli uomini rossi* (The Reds and the Blacks); Annie Vivanti, a woman of international culture—having lived in New York and Wyoming, as well as in Ireland, England, and Germany—who continued her gaiety and humor in *Zingaresca*, in *Gioia* (Joy), and in *Meca culpa* (My Fault). Guido da Verona, in spite of everything, has to be regarded (see *La vita comincia domani* (Life Begins Tomorrow) as one of the masters of the European novel of large canvas and close-worked detail, who, as Tilgher again has said, has expressed certain European states of mind in enduring form and even created moods of life which hosts of people have imitated. Da Verona's vogue was waning, and perhaps his power too; though *La mia vita in un raggio di sole* (My Life in a Ray of Sunshine) is worth reading.

The real recent discovery in the field of the novel was Federico Tozzi (1890-1920), whose premature death did not prevent the revelation of a great genius in the style of Dostoevski in *Tre croci* (Three Crosses), *Il potere* (The Farm), *Ad occhi chiusi* (With Eyes Closed), and *Amore* (Love).

In the world of the theatre, the old and the new came into self-conscious conflict, with new authors, new styles, and a new criticism combating old authors, old styles, old conceptions of the drama. The critic who emerged in this connection is Adriano Tilgher (*Studies on the Contemporary Drama*, trans., New York), whose works are fundamental for a knowledge of the new tendencies (see also *Riconoscimenti—Riconoscimenti*). Tilgher connects the Italian movement with its romantic origins and with the French drama of Sarment, the Belgian drama of Crommelinck, the German "expressionistic" theatre, the Russian plays of Andréev, and the English work of Synge (*The Playboy of the Western World*).

To strike the contrast: the "old" Italian drama, as represented by Roberto Bracco, Sabatino Lopez, Dario Niccodemi, Marco Praga, Salvatore di Giacomo, etc., was more or less the "bourgeois" drama of Paris, reformed by Ibsen (see especially the works of E. A. Butti, who died in 1907). It accepted the social organization of Europe as a fixed organism and pressed the dramatic emotion from the conflict of the individual with the unbreakable restriction that hemmed him in: he could evade them—the ever-recurring salacious comedy of the triangle; he could succumb to them—the ever-recurring "drama," or tragedy, of sentimental motivation. The new drama, in keeping with the revival of Hegelian idealism (Croce-Gentile), but also influenced by Bergson (anti-intellectualism and the "dynamic spirit"), by American pragmatism ("the world is what we make it") and by the forces of which Einstein is at once an interpreter and a creator (relativism), is a philosophical approach to life: What is reality? What is personality? What is morality? Where the old drama looked primarily at what is fixed and unchanging, the new centres its attention

on life's contradictions, incoherences, mutations: life is a flux—therefore reality is never fixed, even people are not today what they will be tomorrow and what they were yesterday. We are phantoms labeled with a name: we are, as Pirandello says, "one, no one, a hundred thousand."

The dramatists of the new tendencies are numerous: Luigi Chiarelli, in *La maschera e il volto* (The Mask and the Face); Rosso di San Secondo in *Marionette—che passione!* (Love's Puppets) and *La bella addormentata* (The Sleeping Beauty); Fausto Maria Martini, in *Ridi Pagliaccio* (Laugh, Clown, Laugh); Pensuti, *L'uomo di legna e la donna di cera* (The Wooden Man and the Wax Woman); and Cavacchioli, author of a host of plays; but overtopping them all for the power and variety of his production, for success at home and international fame, Luigi Pirandello: *Six Characters in Search of an Author*; *Henry IV*; *The Pleasures of Honesty*; *Right You Are*; *Naked*; *Each in His Own Way*; *Think It Over*; *Gimpy*; which are known in every capital of the Western world.

Fad or permanent contribution as the new theatre might be, it bore witness to an activity which had proved stimulating to all factions of the theatre. Nino Berrini and Giovacchino Forzano came forward in a type of poetic, post-romantic historical drama in which Sem Benelli was still a recognized master, though Benelli had never surpassed his old *La signola* (Bookworm), and *Arrigogolo* (The Hour Glass) is inferior to his sensational *La cena delle beffe* (The Jest). One real masterpiece, moreover, distinguished a new type of fantastic classical drama—the *Glauco* of Ercole Luigi Morselli (1881-1921), author also of *Orione*, of three one-act plays and the very readable *Parole per i re d'oggi* (Fables for the Kings of Today). The epigrams of *Glauco* are already numerous: let us mention only *La tela di Penelope* (The Return of Ulysses), of Raffaele Calzini.

Two historical dramas of distinction have been contributed in Enrico Corradini's *Julius Caesar*, and Gellio Cassi's *The Nails of San Casciano* (a play on the life and political activity of Machiavelli). Both these plays have been written in the nationalistic vein and have been dedicated to the Fascist régime.

However, in the Italy of this period, we are confronted with a fascinating insurgence of new forces of which the political manifestations astounded everybody in the triumph of Fascism, and of which the literary manifestations constituted, as was said above, the most distinctive feature of recent years. Aristocracy as against democracy, nationalism as against liberalism and internationalism, discipline and obedience as against the "rights of man"; counter-Reformation as against Reformation, "spirit" as against "stomach," Latinism as against Anglo-Saxon industrialism, materialism, and hygienic "civicism"—such ideas and slogans were being bandied about by young Italians with genius or without genius, in a language full of the strangest and wildest technicalities and in a style taut with straining cerebration. With these youngsters, logic is in bad repute. What one must do is "experience." Struggle is the law of life! *Lottiamo!*

If the War helped to individuate these new tendencies and give them distinctiveness, they go back fully 20 years to self-conscious movements dating from the first lustrum of the century. The first corollary drawn from Crocean idealism by Papini and Giuseppe Prezzolini

(founders, in 1903, of the review called *Leonardo*, and later *La voce*) was that life must be lived or created and not accepted or taken for granted: hence rebellion against passive politics, passive religion, passive culture. Here are to be found the remote origins of Fascism, as indeed the immediate origins of proletarian insurrectionism (the Mussolini of that day), of anti-parliamentarianism (the Mussolini of the present), of Catholic modernism (Ernesto Bonaiuti). In this connection also there were revivals and rehabilitations: if philosophical thought was influenced by Croce, political thought found its Old Testament in the *Sociology* of Wilfred Pareto (1844-1923) and its New Testament in *La rivolta ideale* (The Ideal Revolt) of Alfredo Oriani, who lived in the last half of the nineteenth century and who was also the author of *La lotta politica in Italia*, a history of Italian revolutions and of an influential novel, *La disfatta* (The Defeat). Over against a militant proletarian inspired by Karl Marx, there thus developed in Italy a militant middle class which accepted the class struggle in socialistic terms and fought the Socialists on their own grounds with their own weapons.

This mental unrest may be sensed most fully in Papini, as above suggested—read in addition to *The Failure*, *Il crepuscolo della filosofia* (The Twilight of Philosophy); and *Four and Twenty Minds*, especially if Papini's world-famous *Life of Christ* is to be appraised with any understanding. But hardly less important is the painter-poet, Ardengo Soffici, author of *Lemmo Boreo* (a novel that anticipates Fascism to the letter), of *Arieccchino* and many critical and political essays. Domenico Giulietti, author of a frantic and paradoxical Catholic diatribe—*L'ora di Barabba* (The Hour of Barabbas)—well styles himself the "wild man" in the *Dictionary of a Wild Man* which he wrote in collaboration with Papini. Giulietti's histrionic violence stands out in contrast with another Catholic writer of a real mystic temperament, Giosuè Borsi (1888-1915), author of *Letters from the Front*. Certain characteristic and influential states of mind may be found in Curzio Suckert, *L'Italia vivente* (The Living Italy). Though in this connection we must not forget the speeches and editorials of Mussolini himself now collected in volume form, with his war diaries.

But when the tumult and the shouting dies, a certain bulk of unquestionably sound and coherent achievement will be left as the permanent record of this Italian period. Already the *Letters* and critical essays of Renato Serra (1881-1915) had acquired an almost classic prestige. Giuseppe Prezzolini (read *La cultura italiana*—Italian Civilization) lived all his life of thought and passion and worked it into a literary product that has judgment and fairness and character, as well as brilliancy. He has made two important contributions in *I maggiori* (Most Important Authors of Italian Literature), and *Machiavelli*, an appreciation on the life and milieu of the Florentine statesman. Mario Missiroli is a publicist who saves himself many palinodes by thinking before he writes. Gaetano Salvemini entered political and social polemics with the sobriety of the historian and the courage of a warrior.

In pure literature, we may mention the work of Massimo Bontempelli, *I sette savi* (The Seven Sages); *La vita intensa* and *La vita*

*laboriosa* (The Strenuous Life and The Laborious Life); the tales of Ferdinando Paolieri (the real successor, perhaps, of Renato Fucini in the Tuscan spirit), the varied work of Enrico Pea, *Spaventaccio* (The Scarecrow), and a play, *Judas*, and the delicate humor of Giuseppe Zucca, *Il morbo della virtù* (The Disease of Virtue). A young critic from whom something was to be expected was Piero Gohetti (see *La frusta teatrale*, The Theatrical Whip).

And now, collecting some loose but important ends, we may add that Lorenzo Viani throws an enigma in the recent literary output in his novel, *Angiò, uomo d'acqua* (Angiò, Man of the Seas) which deals with a wonderful picturization of sea dregs that know no law except that of instinct; no reality except that which borders on tragedy and on the grotesque. Another puzzling author is Achille Campanile who has thrown Italian critics into confusion in his two books, *Ma che cosa è questo amore?* (What is This Thing Called Love?), and *Se la luna mi porta fortuna* (If the Moon Brings Me Luck). Both are humorous novels abounding in comic situations and libertine observations. Critics are at variance with regard to Campanile's humor which has been denounced, for the most part, with unsavory adjectives such as, "slapstick," "in the manner of Charlot," "asinine." In the meantime the public has "devoured" close to a hundred thousand copies of his two books. The Roman poet Trilussa (Carlo Alberto Salustri) has continued, in his screamingly funny sonnets in Roman dialect, the more recent traditions of Pascarella (author of *The Discovery of America* and *Villa (Flora)*), Augusto Sindici, and the immortal Oronzo Marginati (Luigi Lucatelli, a prose "columnist," and author, for instance, of *Come ti erudisco er pupo*—Bringing up the Kid; and *Così parlano due imbecilli*—Thus Spake Two Fools, translated by Maurice Bishop as *Theodore the Sage*). The great "dime novelists" still remained, Mario Mariani, Pittigrilli, and Carolina Invernizio (1857-1917). Authors of children's books, since the classic Pinocchio of Collodi, were Vamba, Beltramelli, and Barzini. One of the best works of historical scholarship is Corrado Ricci's *Beatrice Cenci*. The editor Formigini of Rome has published an Italian Who's Who—*Chi è?* (It is curious to note that in the notices on the important women, as a special courtesy, the date of birth is not given). The best foreign study on contemporary Italian literature is Benjamin Crémieux' *Panorama de la littérature italienne contemporaine* (Paris). And last but not least among the loose ends is the *Notturmo* (Nocturne) of Gabriele d'Annunzio.

In conclusion we may write a few words with regard to the ever-increasing activities and efficient reorganization of the publishing houses. These houses are not only offering a steady market and lucrative returns to the *letterati* of established reputation, but are actually rendering invaluable service to the young men by opening their doors to them, even though frequently they speculate with losses in giving the youngsters a chance. The houses vie with one another in establishing prizes for the different literary genres, thereby stimulating directly the production in general. Indirectly, they are contributing in no small degree to the establishment of a vast reading and discriminating public without parallel in the history of Italian publication. The Fascist cry of "ef-



iciency" has reached the publishers with the result that their systems have been completely recast. For the first time in the history of their existence, the Italian publishing houses have dared detach themselves from their sterile and traditional policies, and, if you please, have dared be enterprising and original. The influence which Italian editors will have on the future output will not pass unnoticed. This is a period of stimulation, of work, and results—a period of literary production supported by a government made up of members of the same family, a family of *politico-letterati*.

**ITALIAN SOMALILAND.** See SOMALILAND.

**ITALY.** A constitutional monarchy of southern Europe; area before the World War, 110,632 square miles; population (census of 1911), 34,671,377; population for the same area by the census of 1921, 37,276,738; population per square mile (1921), 336.9. The annexed territories by the Treaty of St. Germain were: Venezia Tridentina, area 4027 square miles, population (1921) 648,208; Gorizia and Gradisca and districts, area 1138 square miles, population (1921) 310,642; Trieste, area 37 square miles, population (1921) 238,655; Istria, area 2035 square miles, population (1921) 342,979; Zara and islands annexed from Dalmatia, area 113 square miles, population (1921) 18,719. Total area in 1921, 117,982 square miles; total population, 38,835,941; estimated, at the beginning of 1928, 40,796,000. Comparative vital statistics for the period discussed were as follows (figures for 1912 and 1922, based on ratio per 1000 of population and applying only to pre-war boundaries): marriages, 7.6 and 8.74; living births, 32.38 and 28.55; deaths, 18.15 and 16.66. The influenza epidemic of 1918 raised the mortality to 32.97 per 1000 inhabitants (exclusive of war deaths). The average number of births from 1923 to 1927 was 27.8 per 1000 inhabitants; deaths, 16.5 per 1000. Emigration, which had reached its peak in 1913 with 872,598, fell off during the war years, dropping to its lowest level in 1918 with 28,311; but by 1921, emigration had once more mounted to 255,166, and in 1927, to 228,052. Whereas, in 1913, almost two-thirds of the emigrants had migrated overseas, in 1927 only a few more than one-half did so. In 1927 emigrants overseas totaled 136,094; to Europe, etc., 91,958. This was occasioned by the fact that many Italians sought work in the devastated French areas, although the restriction imposed on immigration into the United States was a contributing cause. Before the War, the ratio of immigrants (i.e., returning Italians) to emigrants varied from one-third to one-half. In 1927, 140,625 Italians returned, of which number 43,787 were from the United States and Canada. The population of the large cities in 1921 (1911 figures in parentheses) were as follows: Naples, 780,220 (678,000); Milan, 718,304 (599,000); Rome, 691,314 (542,000); Turin, 502,274 (427,000); Palermo, 400,348 (341,000); Genoa, 300,784 (272,000); Catania, 255,394 (211,000); Florence, 253,565 (233,000); Bologna, 210,969 (173,000); Messina, 176,794 (127,000); Venice, 171,665 (161,000); Bari, 131,143 (104,000); Leghorn, 114,813 (105,000). Principal cities in the annexed territories were: Trieste, 238,655 (1921); Pola, 49,900; Trento, 35,125; Gorizia, 25,576.

**Local Government.** Following the census of 1921 there were certain changes in the local gov-

ernment of Italy and several small communes were annexed to the older communes so that on Aug. 20, 1928, there were 7915 communes. In all of the various communes there is a *podestà* at the head of the communal organization, except in the cases of Rome, which has a governor, and Naples, which has an extraordinary royal commissioner. The *podestà*, nominated for five years by royal decree in the larger communes, may be assisted by one or two vice-*podestàs* or deputies; while associated with him the prefect of the province may nominate for a corresponding term a municipal council drawn from persons designated by the local syndical associations. The nomination of such a council, the function of which is advisory and concerned with such subjects as the budget, imposition of taxes, etc., is obligatory in communes which are the capital of provinces, or have a population of more than 20,000.

**Education.** In recent years, the State has applied itself seriously to the problem of illiteracy and in 1919 set up a national institute for the instruction of illiterate adults. Many districts, notably in the provinces of Novara, Turin, Como, and Cuneo, could record the fact that all young people 20 years of age were able to read and write. Under Mussolini, educational legislation, while frequent, took on a reactionary tinge. Compulsory religious education, conducted by teachers receiving the approval of the Church authorities, and the displaying of the crucifix in all schools, were ordered. Limitations were also placed on the number of free students, and, to this end, severe competitive examinations were fixed. In all elementary schools, public and private, there were 4,523,183 pupils in attendance in 1915-16. The increase was slight over the previous recorded year, 1907-08, as is indicated by the fact that there were 3,002,168 attending public elementary schools in 1907-08, and 3,167,245 in 1915-16. In all government and private secondary schools, the enrollment in 1919-20 was 346,218. The increase in technical schools was particularly noteworthy, attendance in government schools in 1919-20 being 173,296 as compared with 103,118 in 1910-11. The eagerness for higher education was even more marked in the universities, for the attendance increased from 21,615 students in 1911-12 to 41,176 in 1919-20. The number of pupils enrolled in elementary public schools in 1926-27 was 3,690,698, and the number in other educational institutions of all grades, other than infant schools, was about 525,000.

**Agriculture.** Recovery in the field of agriculture was rapid after the War, though government requisitions of crops in 1919 and 1920 made resumption somewhat tardy. The table on page 822 furnishes a basis for comparison.

Orchards, yielding large crops of oranges, lemons, chestnuts, pomegranates, quinces, apples, and pears, as well as walnuts and almonds, continue to flourish, though by 1929 the crops had not yet reached pre-war levels. Silk culture, after a period of decline, assumed its pre-war importance in 1923. In the three-year period, 1910-12, the silk-cocoon crop averaged 41,200 metric tons. In 1922 it was 31,000 tons; but in 1923, 755,100 tons. The decline prior to 1923 was due to the destruction of the mulberry trees in Piedmont, Lombardy, and Venetia—the chief centres. After the War, the factory capacity of the silk mills similarly declined, as

## CROPS: AREA, PRODUCTION, AND YIELD PER

Crop	Area (thousands of acres)		Production (thousands of units—bushels, except as indicated)	
	1909—1913	1927	1909—1913	1927
	1913		1913	
Wheat	11,798	12,320	184,393	195,808
Rye	346	307	6,317	5,937
Barley	647	583	10,638	9,443
Oats	1,276	1,203	37,537	30,720
Corn	4,090	3,755	102,676	87,378
Rice	358	351	23,273	34,102
Potatoes	759	874	87,514	71,476
Sugar beets	130	219	1,799	2,026
Olive orchards	5,702 <sup>b</sup>	5,668 <sup>c</sup>	47,283 <sup>d</sup>	39,110 <sup>d</sup>
Grapevines	10,983 <sup>b</sup>	10,574 <sup>c</sup>	1,215,621 <sup>b</sup>	941,769 <sup>e</sup>

<sup>a</sup> Unit, metric tons.<sup>b</sup> Within former boundary.<sup>c</sup> Includes land carrying also one or more other crops.<sup>d</sup> Unit, gallon of oil.<sup>e</sup> Unit, gallon of wine.

many plants were sold during the War for their metal. Live-stock figures for 1926 revealed (1908 figures in parentheses): horses, 1,001,000 (955,878); asses, 505,000 (1,238,000); mules, 955,000 (1,230,060); cattle, 7,150,000 (6,198,861); pigs, 2,750,000 (2,507,928); sheep, 12,170,000 (11,162,926); goats, 3,130,000 (2,714,878). The wool yield maintained an average of 33,000 tons and had to be supplemented by importations.

**Mining and Manufacturing.** The capacity of the hydroelectric plants of Italy in 1926 was 2,117,000 kilowatts (equal to about 2,839,000 horse power) as compared with 1,239,000 in 1922. The output in 1926 was 7,281,000,000 kilowatt-hours. In addition, there are steam-electric plants with a capacity in 1926 of 555,000 kilowatts and an output of 363,000,000 kilowatt-hours. In view of the fact that Italy produces practically no coal, the hydroelectric developments are of great importance. The potential capacity of the waterfalls of the country, developed and undeveloped, is estimated at 3,800,000 horse power.

According to the industrial census of Oct. 15, 1927, there were in Italy 728,150 establishments employing 3,965,500 wage earners. The number

MINERAL AND METAL PRODUCTION  
(Metric Tons)

Product	1913	1926	1927
Iron ore	603,116	504,556	411,300
Lead ore	44,654	54,206	52,380
Zinc ore	153,273	177,932	173,790
Iron pyrites	817,334	594,479	604,300
Lignite	701,079 <sup>a</sup>	1,181,342	1,075,220
Sulphur, crude and ground	406,406	305,012	338,000
Asphalt rock and crude bitumen	171,490	313,525	386,000 <sup>b</sup>
Metallic mercury	1,004	1,871	1,990
Marble	509,342	634,162	730,970
Granite and porphyry	389,015	441,660	173,000
Talc and soapstone	24,001	43,085	32,000
Pumice	14,973	45,308	38,000
Lead	21,674	23,590	22,850
Salt, marine	585,028	461,116	416,895

<sup>a</sup> Including anthracite, etc.<sup>b</sup> Not including crude bitumen.

## INDUSTRIAL PRODUCTION

Product	1913	1926	1927
Pig iron	metric tons 426,755	513,425	596,100
Crude steel	do 933,500	1,779,519	1,530,600
Ferro alloys	do 4,700	45,111	.....
Coke, metallurgical	do 498,442	591,528	.....
Silk, raw	1000 lbs 10,366	9,825	9,887
Rayon	do 331	37,000	48,400
Cotton yarn	do 886,956	431,772	404,844
Cotton fabrics	1000 yds 710,450	1,022,320	983,700
Woolen fabrics <sup>a</sup>	do 71,000	98,370	88,533

<sup>a</sup> Estimates.

of employees by principal industries was as follows: Textiles, 636,687; transport and communications, 514,729; clothing 490,798; machinery and related industries, 408,699; foodstuffs, 339,520; construction, 328,734; lumber and wood-working, 284,931.

The total value of mineral production proper, in Italy in 1926 was \$29,773,000. The value of the principal metallurgical and mineral products in that year was as follows: Pig iron, \$14,383,000; crude steel, \$61,286,000; coke, \$7,031,000; mercury, \$3,639,000; and lead, \$3,685,000.

**Commerce.** Imports in 1913 were valued at \$707,664,101; in 1927, at \$1,051,000. Exports in 1927 were \$806,000,000, as against \$500,241,667. (The 1927 figures are converted from the average exchange rate for the year.) In 1913 countries of origin of Italian imports ranged in the order: Germany, Great Britain, United States, France. In 1927 the order was: United States, Germany, Great Britain, and France. Countries taking Italian exports in 1913, in order, were: Germany, Switzerland, United States, France, Austria-Hungary, Great Britain. In 1927 the order was, Germany, United States, Great Britain, France. In 1927 the United States' sales to Italy amounted to \$204,252,000; purchases from Italy amounted to \$84,873,000. Italian imports continue to be such basic raw materials as wheat, raw cotton, metals and minerals, mineral oils, hides, tobacco, lard, and bacon. This dependence on foreign countries for wheat and scrap iron, particularly, continually operates to Italy's disadvantage. The tendency after the War for nations to restrict their exports of important articles or to charge higher prices abroad than those asked at home, accounted for a bitterness of feeling that often was publicly voiced. Leading exports were, in order of value (1927), cotton manufactures, raw silk, silk manufactures, hemp, spun cotton, automobiles, wines, hats, etc. Leading foodstuffs exported were lemons, olive oil, cheese, fruits, vegetables, tomato conserve. In 1914 the Italian merchant marine consisted of 644 steamers of 1,534,738 gross tons and 523 sailing vessels of 237,821 net tons; in 1927 the marine consisted of 1329 steamers of 2,072,672 gross tons and 3064 sailing vessels of 187,290 gross tons. During the War, Italy's shipping losses were the severest, proportionately, of all the combatant nations. Thus, 677,207 tons were lost by sinkings alone, while in all, 1,070,171 tons were lost, made up of sinkings, sale to foreigners, those broken up for material, etc. However, Italy was compensated by the accretions of Austro-Hungarian ships, as well as the active building carried on over the whole of 1915-27. In 1911, 173,437 vessels of 56,056,306 tons had entered Italian ports; 173,353 vessels of 56,082,448 tons had cleared. Nothing indicates better the tardy commercial recovery than the fact that in 1919 only 98,189 vessels of 24,093,639 tons entered and 98,144 vessels of 24,143,487 tons cleared Italian ports. In 1927 243,378 vessels of 67,810,006 tons entered and 243,231 vessels of 67,542,887 tons cleared.

**Communications.** In 1913 there were 11,015 miles of railway; in 1928, 13,355 miles. In 1913, 8540 miles were under government management; in 1927, 10,300 miles. A serious concern after the War was the sad state of disrepair into which the railways had fallen. The loss and depreciation of railway stocks, the

overmanning of the entire system (employees had increased 46.6 per cent between 1914 and 1920), the eight-hour day and the lowered efficiency of the workers, all contributed to a general deplorable condition. The deficit of the fiscal year 1920-21 was 1,034,000,000 lire, and of 1921-22 was 966,000,000 lire; this in spite of the continually rising tariffs. (Freight rates from 1915 to 1922 increased 400 per cent.) Electrification of railways was a theme of continual discussion, though the unfavorable financial situation militated against any extensive projects. It was proposed to electrify nearly 4000 miles of line. As a way out, the Mussolini government expressed itself as favoring the resurrection of private management, but, while extensive reforms and reductions of personnel were carried out, no definite move, by 1929, was made toward private operation, possibly because by that time the State railways were on a paying basis.

**Finance.** Italian budget estimates for 1928-29 showed an estimated surplus of 271,000,000 lire. The estimates for both revenues and expenditures indicated a considerable reduction from the estimates of the 1927-28 period and a still greater decline from the actual returns for the 1926-27 period. The revenues were placed at 17,643,000,000 lire and expenditures at 17,372,000,000 lire. The public debt at the beginning of 1929 was 86,500,000,000 lire.

GOVERNMENT RECEIPTS AND EXPENDITURES  
(Millions of Lire)

	1924- 25, actual	1925- 26, actual	1927- 28, budget
<b>Receipts</b>	20,440	21,044	19,621
Direct taxes	5,531	5,909	5,428
Registry, stamp, and transfer taxes	3,199	3,674	3,704
Indirect taxes	3,156	3,190	4,438*
Tax monopolies and lottery (gross)	3,767	4,018	4,092
All other	4,787	4,253	1,961
<b>Expenditures</b>	20,023	18,775	19,329
Debt service	5,174	3,874	4,652
National defense	3,042	3,449	4,062
War pensions	(b)	(b)	1,138
Public instruction	995	1,170	1,156
Tax monopolies and lottery (gross)	(b)	(b)	1,118
All other	10,812	10,282	7,203
Equivalent (\$1,000,000):			
Receipts	858	825	1,095
Expenditures	841	730	1,079

\* Including 1,500,000,000 lire, estimated additional sum to be collected in paper lire to cover duties assessed on gold basis.

(b) Not available.

**History.** Although Italy had been linked with Germany and Austria-Hungary in the Triple Alliance since 1882, the Italian government, on Aug. 3, 1914, declared its neutrality in the War, on the grounds, first, that since the War had been caused by the aggression of the Central Powers, the *casus foederis* provided for in the strictly defensive Triple Alliance had not arisen; and, second, that by failing to acquaint Italy, in advance, with the terms of the note to Serbia, Austria-Hungary had disregarded the terms of the Alliance. As a matter of fact, by secret agreements with France (1902) and Russia (1909), Italy had pledged herself not to aid Germany and Austria-Hungary in an aggressive war. Moreover, the entrance of Great Britain into the struggle removed all thought of participation against the Entente. The neutralist attitude at first was strongly championed.

The low state of the finances and the fact that Italy had not fully recovered from the Libyan War (see LIBYA) together with a belief that hostilities against her erstwhile allies must be contemptuously regarded, were the more important factors contributing to this view. Some measures were taken to relieve the stringency that war conditions brought in their train. Exports of cereals were prohibited; a moratorium was declared; and steps were taken to further a ready importation of raw materials. Meanwhile, the war establishment—five classes had been mobilized—necessitated great outlays of money, and a cabinet crisis precipitated over the need for tapping new sources of revenue resulted in the formation of something like a coalition government with Baron Sonnino at the Foreign Office.

As the War, however, took on ever-increasing proportions and as the intrigues about the Italian Foreign Office became more numerous, it began to appear that a change had taken place in Italian public and official opinion. The character of the sentiment, with 1915, took on a more bellicose hue; Italy meant to join the Entente, every one saw, at a price. The recovery of the northern provinces had of course always had a certain appeal to popular sentiment, but that Italy's entry into the War was to be purely a matter of diplomatic arrangements was not to be concealed. Germany, sensing this, sent the astute Prince von Billow to Rome in order to keep Italy neutral if possible. Austria was urged to satisfy Italian demands for territory as far as she was able. Protracted negotiations were carried on between Austria and Italy, but neither of Austria's offers came up to the minimum of Italy's demands. See TYROL, GERMAN SOUTH. The result was, Sonnino terminated the conversations and turned to the Entente. On April 26, the secret Treaty of London was signed. By it, for full participation in the War, Italy was to receive the Trentino and South Tyrol to the Brenner Pass, the city of Trieste, Gorizia, Istria, Dalmatia as far as Cape Planka, Valona (which had already been occupied on Oct. 30, 1914), the Adriatic islands, and the Dodecanese including Rhodes. Other promises of territory included a sphere of influence in Asia Minor, and grants in Africa.

That the anti-war party was still strong was shown when Premier Salandra resigned because of the failure of Giolitti and his followers to approve of his policy; but war demonstrations and the agitations of d'Annunzio had touched the popular temper with the result that Signor Salandra once more assumed the reins of office, and boldly asked the Parliament for a war declaration. On May 20, 1915, the Chamber invested the Government with complete powers; on May 23, the army was ordered mobilized; and on May 24, war was declared against Austria. Later in the year, Italy declared war on Turkey and Bulgaria, but it was not until August, 1916, that she broke relations with Germany.

Italy's rôle in the World War, at least down to the latter half of 1918, was hardly glorious. Her loss in men was 650,000 killed, with close to another quarter-million permanently incapacitated. By November, 1918, however, Italian troops occupied all the territories assigned to Italy by the London Treaty. See WORLD WAR.

In the discussions of the peace, Italian public opinion centred not only in the necessity for the rectification of the northern frontier line

(in spite of a preponderance of alien populations in some sections) but also in the need for retaining Fiume and Dalmatia, which had been occupied at the close of the War. On this matter, the hostility of the Yugoslavs was encountered so that the settlement of the question continued to absorb Italian attention for the next three years. Italy's representatives at the Peace Conference were Orlando, Sonnino, Salandra, Barzilai, and Salvago-Raggi. These readily acquiesced to the partition of the German Africa colonies between France and Great Britain, accepting, by way of compensation for Italy, only promises of slight additions to Libya and the Italian Somaliland, but on the questions of Dalmatia and Fiume, they stood firm. Yugoslavia, however, had gained a friend in President Wilson. On Apr. 23, 1919, after protracted conversations among the Big Four had yielded no results, President Wilson issued a public statement to the Italian people in which he counseled renunciation of Fiume and Dalmatia. Instead of having the desired result, President Wilson's action only served to solidify all branches of opinion. Orlando, having withdrawn from the Peace Conference, received an overwhelming vote of confidence in the Chamber, even the Socialists and the Laborites giving him their support. The failure, however, of the delegates to gain any concessions on this point resulted in a negative vote of confidence in the ministry with the result that Orlando was compelled to resign on June 19, 1919. Signor Nitti accepted the Premiership. The increasing difficulties at home because of the lack of raw materials and the ever-recurring labor disturbances only added to the trials of the Government, but interest, in large part, was diverted by the Adriatic question.

The failure of the Peace Conference to bring out a settlement that could be acceptable to Italian opinion strengthened the hand of the irreconcilables, with the result that d'Annunzio, on September 12, entered Fiume at the head of a small force and confronted the peace-makers with a *fait accompli*. Public support rallied to him at once. In spite of Nitti's official disavowal, the heated protests of the Peace Conference, and the frequent clashes between Yugoslavia and Italians, d'Annunzio stayed on. Even the very favorable treaty with Austria, signed at St. Germain on September 10, by which Italy gained her northern frontier, elicited no real enthusiasm: Fiume was the question of the day.

On Nov. 16, 1919, the new elections were held. The results marked the entry of a new force into Italy's political life, for 103 members were elected who belonged to the (Catholic) Popular Party. For the first time since 1870, therefore, the Catholics as an official body took their place in the country's political activities. Their programme resembled in large part the typical proposals of the Centrist and Christian Socialist parties with which continental Europe already was familiar. The Socialists were the only other well-integrated force, and succeeded in electing 160 members. Their stand was frankly revolutionary: they looked to Russia for inspiration, and the economic chaos of the moment gave them strength.

The opening session of the Parliament was a noisy one, and the King's speech from the throne was greeted with derision; but in spite of the weaknesses of the constitutional parties, Nitti,

by maintaining a precarious balance of power, continued in office. The year 1920 was characterized by an intensification of the same problems. The question of the Fiume settlement was no nearer a solution. The hard feeling engendered by President Wilson's insistence upon his scheme of a Fiume Free State and the fact that Italy's counter-proposal, though acceptable to the Supreme Council, was wholly rejected by Yugoslavia, were elements that made the tangle more and more snarled.

The revolutionary disorders of the year, accompanied by rioting and anarchistic outbreaks, and the mounting cost of living, indicated that Italy was living on a volcanic crater. These uncertainties were reflected in the political life. A cabinet crisis in the spring forced a reconstruction of the Nitti government; on May 12, the Premier was compelled to resign, and after several unsuccessful manoeuvres, was supplanted by Signor Giolitti. The entrance of the Albanian question into prominence involved Italy in another international controversy. In 1917 Italy had proclaimed Albania her protectorate, but the status had been refused recognition by her allies. Up to 1920, an army had been maintained in the country to the general dissatisfaction of the populace, with the result that fighting broke out between Albanians and Italians in the summer. The universal attention given to the controversy, together with the support the Albanian cause found among the Italian Socialists, forced Giolitti to open negotiations with the Albanians. The result was the evacuation of the country, Valona, which had been held since 1914, being given up on Sept. 2, 1920.

It was not until late in the year that the settlement of the Adriatic dispute appeared a possibility. The disappearance of President Wilson from the scene, and the realization by both Italy and Yugoslavia that an understanding could more easily be reached by agreement between themselves, led to the signing of the Treaty of Rapallo (Nov. 12, 1920). By it, Italy gave up Dalmatia and restored to Yugoslavia two small territories lying to the southeast of Istria, but received the town of Zara. On their part, the Yugoslavs agreed to an Italian frontier enclosing all of Istria and extending as far as Monte Nevoso. Fiume was made a Free State and was connected with Italy on the west by a territorial corridor along the sea. It was also stipulated that the city of Susak (together with the small Baros Basin) was to be joined by Yugoslavia. Ratification immediately followed. It was necessary to apply force before d'Annunzio could be dislodged. In June, 1921, Italy and Yugoslavia signed an agreement for the creation of a port board to regulate the commerce of Fiume and other harbors in the territory. For the ultimate solution of this dispute, see FIUME-ADRIATIC CONTROVERSY.

There were other foreign problems which occupied the attention of the Government in 1920 and 1921. Italy in August, 1920, signed the later discredited Treaty of Sèvres with Turkey by which Italy received important concessions in Anatolia and the right to exploit the Hieraclea coal mines. In turn, Italy, by a separate understanding, agreed to relinquish the Dodecanese to Greece, except that Rhodes and two others were to be held for 15 years. A plebiscite was to determine their disposition later. In 1921 a commercial agreement was signed with Soviet Rus-

sia and the Ukraine and treaties also were concluded with Germany, Czechoslovakia, and Poland.

Between Italy and France an ever-widening breach, not surprising in the light of the old hostility, was becoming perceptible. A French decree which denied Italian citizenship to the many Italians residing in Tunis was bitterly resented, the ill feeling manifesting itself in the attacks on the French military mission which visited Italy in October, 1921. These matters, naturally, were overshadowed by the grave internal situation which developed in 1920. Throughout the whole of the year, Italy was in the grip of disputes that took on the character of civil war: the seizure of the factories, the agrarian uprisings, the street fighting, and the local disturbances that, in Bologna in particular, took on all the familiar forms of a people torn by internal dissension, contributed to the general feeling of uncertainty.

In the light of these happenings, it was inevitable that a violent form of dissidence should manifest itself. Armed bands, strongly nationalistic in spirit, and bearing the name Fascisti, appeared in the industrial cities of the centre and north and openly attacked Socialist and Labor halls and assemblies. In Bologna, where Socialists controlled the local government, hostile attacks destroyed the labor exchange and forced into flight the Socialist officials. The same events took place at Modena, Ferrara, and elsewhere. Fascisti were meeting Socialists on their own ground, with the result that blood was frequently spilled. The reaction made itself felt in the internal policies of the Socialist Party. In January, 1921, the reformist Socialists and the Communists parted company, the points of disagreement being adherence to Russia and the espousal of violent means. The Communists and the Fascisti now came into conflict at Florence, Palermo, and Spezia. There was fighting in Rome in July and again in November, but everywhere it began to appear that Fascisti and not Communists were gaining the upper hand. The events of the next year were being foreshadowed with remarkable clearness.

Meanwhile, the Government was in difficulties. The price of bread, still fixed by the Government, which was compelled to make purchases abroad at great losses, was the greatest cause for dissension. This and the feeling that Parliament no longer represented the country, hastened Giolitti's decision to dissolve the Chamber. The new election, held on May 15, 1921, did not produce any startling results. Of the 535 members, 107 returned were Catholics, 122 were Socialists, 16 Communists, and 275 Constitutionalists of various shades. In the new Parliament, the Government's foreign policy met with the sharpest criticism, with the result that Giolitti resigned. Signor Bonomi now constituted a cabinet that represented all parties except the Socialist. His stay was not long, for criticisms appeared from all quarters. The failure to secure participation in the Four Power Treaty, the inability to cope with the economic problems and the ever-present lawlessness of Communists and Fascisti, and the antagonism that greeted what seemed a too friendly attitude toward Catholicism, precipitated a crisis. On Feb. 2, 1922, Bonomi resigned and only with difficulty could a new ministry be formed. Signor Facta eventually constituted a cabinet

which fell on July 10 but was compelled to return because no other group could gain the confidence of the Chamber. The menace to the state was not Communism now, but Fascism. See FASCISM.

The strength of the Fascisti waxed greater as the year progressed. Fascisti and Communists continued their warfare openly amid a general helplessness. There was fighting in Rome, Bologna, Genoa, Trieste, Alessandria, and Parma, and a Fascisti force took Fiume and drove out the provisional government (March 3). New recruits were continually filling out the ranks. On Aug. 21, 1922, the syndicate of railway men went over to the Fascisti; in the same month, with the connivance of the transport workers, Fascisti seized the ports of Genoa and Naples. On September 1, a body of 4000 moved on the town of Terni and captured it. In October, the Fascisti took it upon themselves to Italianize the German populations of the Trentino which had been accorded racial autonomy. The schools were closed and the local councils dismissed while the military was unable to intervene.

It was thus evident that Fascism was exerting a force far superior to that of the constituted authorities. Signor Mussolini, the leader of the movement, demanded for his party the cabinet portfolios of Foreign Affairs, War, Navy, Labor, and Public Works. An offer of several minor cabinet posts was tartly refused, and at the annual convention of the Fascisti at Naples, Signor Mussolini declared, "Either the government of the country must be given peacefully to the Fascisti, or we will take it by force." As the cohorts of black-shirted Fascisti began to mobilize against the capital, Premier Facta bowed before the impending storm and resigned office, October 26. Thereupon, Mussolini, summoned by the compliant King, entered Rome in triumph, formed a cabinet on October 30, and declared, "Today Italy has not only a cabinet, but a government." His successful intimidation of the Chambers gained him a vote of complete authority.

In the ensuing years, the career of Mussolini was, in large part, the history of Italy. The conciliatory tone of the new government surprised many, and the strong measures for the economic reconstruction of the country gave a new impetus to manufacturing and trade. Opposition was stilled, the fear of the swift arm of the black-shirted Fascisti succeeding in overawing dissident groups. On December 16, Mussolini, not as head of the state, but as leader of the Fascisti, moved against all armed organizations through the creation of a newly nationalized militia of 80,000 men. Fascisti organs frankly advocated the suppression of the freedom of the press and the death penalty for the opponents of Fascism. Throughout the year 1923, Mussolini's hold tightened. The parade of reforms executed made a brave show. The desperate financial situation was manfully tackled and the budget for 1923-24 showed a smaller deficit than any previous post-war year; the middle classes were conciliated by the abolition of 9 out of the 13 sources of direct taxation; the inheritance tax was dropped; many onerous duties on necessities were removed; expenditures were cut down through the elimination of useless functionaries and the dismissal of extra employees, on the railways in particular. In the field of public works, sums



were allotted for the rebuilding of Messina, the construction of aqueducts in Sardinia, the rebuilding of the harbor at Naples, and for constructing new railways in Sicily. Railways, something unheard of before, ran on schedule time, notable reforms were achieved in the Department of Justice, as many as 500 local courts and four of the five courts of cassation being suppressed. In educational matters, the changes were far-reaching. Religious education was made compulsory; vocational guidance was stressed; and, as a move against too zealous an application of the democratic dogma, a limit was placed on the number of free students in state institutions.

The state, too, proceeded to relinquish its participation in industry. Several state monopolies, notably the match industry, some telephone services, and concessions for building railways, were surrendered. In administration, the process of centralization went on speedily: five ministries concerned with internal affairs were consolidated into one, as were also the ministries of Finance and the Treasury; the former practice of ministerial reports to Parliament was replaced by a single message for all the departments from Mussolini himself; the rule of merit was applied to promotions; working conditions for state employees were improved. Never were relations between Italy and the Vatican more cordial. In short, in every field of activity the new administration could point with pride to some just change or some alleviation of old distresses. Whether, however, reforms of this character had any claims to permanency or whether they had the whole-hearted approval of the Italian population, it was impossible to say, at least in 1923, for the free exercise of opinion and the give and take through which a democracy functions were almost wholly lacking.

The Communists were moved against with severity. On February 10, leaders of the party were seized and arrests in all parts of the country followed. On January 25, on a charge of interfering in politics, the General Workers' Union of Turin was dissolved; and in March, the editor of the radical Socialist *Avanti* was arrested by order of the Prime Minister. At Venice, Rome, and Florence, Communist disorders were put down with a high hand. A general order prohibited the publication by newspapers of false or biased reports, or reports tending to excite class hatred, or subvert the respect due to national institutions, the Pope, and the State. By the passage of an electoral reform measure in July, 1923, Fascism's hold was strengthened, for the act gave the party polling a plurality of the votes in an election two-thirds of the seats in the Chamber. On December 10, a decree, was promulgated dissolving the Chamber and ordering a new election. Mussolini made it plain on that occasion that he would request a renewal of his dictatorial powers from the new Parliament.

In the domain of foreign affairs, the same resoluteness of purpose was marked. It became increasingly evident that Mussolini's foreign policy was aimed at a speedy intimidation of Yugoslavia and the establishment of Italy in a commanding position not only in the Adriatic but in the Mediterranean as well. Several events pointed to this end. The murder on Greek soil, in August, 1923, of Italian officers on their way to participate in the delimitation

of the Greco-Albanian frontier was immediately followed by a drastic ultimatum to Greece which demanded full apologies and an indemnity of 50,000,000 lire. Greece's desire to discuss the matter first, before yielding up, as she believed, her national honor, was sternly rejected, with the result that an Italian fleet was sent to Corfu and ordered to open fire. In the bombardment of the island, 20 refugees were slain and 30 others wounded. Mussolini's refusal to consider the matter as lying within the jurisdiction of the League of Nations and his defiance of Great Britain even in the face of a threat to cut off his coal supply, for the moment seemed to threaten an international crisis. For a week, uncertainty prevailed, when Mussolini was induced to accept the Council of Ambassadors as arbiter. On September 7, the Council decided in favor of practically all of the Italian claims: apologies were to be rendered to the Allied representatives as well as naval salutes to the flags of the Allied ships; official mass for the dead was to be celebrated at Athens; and military honors bestowed on the Italian victims. Inasmuch as the search for the murderers had been carried on half-heartedly, Greece was ordered, on September 26, to pay the 50,000,000 lire demanded as an indemnity. On the other hand, Italy agreed to evacuate Corfu before October 1.

Toward Yugoslavia, Mussolini applied something of the same methods. The execution of the Treaty of Rapallo he regarded as a surrender of Italy's just claims and upon Yugoslavia's insistence that the matter be brought to a close, Mussolini on August 30 dispatched a peremptory note to Belgrade in which he declared that the only settlement acceptable to Italy would be the inclusion of Susak (including the Baros Basin) in the Fiume Free Port area. Yugoslavia refused to be intimidated. The result was the dispatching of an Italian force into Fiume on September 16 and the establishment of a military protectorate. It is true that this did not change matters any, for it merely gave official approval to what had been a virtual Italian occupation by the Fascisti over the previous 18 months. In the face of so trying an incident, the Yugoslav government remained cool, contenting itself with the statement that the matter was to be submitted to the League of Nations which had, only shortly before, registered the Treaty of Rapallo. The crisis, however, was settled without recourse to the League. Direct negotiations led to the signature at Rome in January, 1924, of a treaty whereby Fiume was yielded to Italy and the River Eneo fixed as a boundary. Porto Barros, however, was included in Yugoslavia, and arrangements were made to facilitate Yugoslav commercial access to the sea through Fiume and Porto Barros. Furthermore, each nation pledged neutrality in case the other should be attacked by a third power; and both agreed to maintain the peace settlement. See FIUME-ADRIATIC CONTROVERSY.

In the eastern Mediterranean, the same success attended Italy's efforts. In the fall of 1922, as Turkish success over Greece seemed assured, the Italian government repudiated the Treaty of Sèvres by which it had consented to the evacuation of the Dodecanese and indicated that it meant to prolong its occupation of the islands. The Treaty of Lausanne of 1923 put the stamp of approval on this act. By it, the 13 islands in question, including Rhodes, were yielded up

to Italy and not to Greece, in spite of the pre-vaillingly Greek population. Other incidents of the year pointed to the fact that Italy meant to assume a more important position in world affairs. In November, the Spanish royal family, accompanied by Rivera, was received at Rome and the conversations carried on pointed to the fact that both nations meant to adopt a common Mediterranean and South American policy. This was indicated by the insistence of Italy on representation at the Tangier Conference, and later, in January, 1924, by the sending of a mission to South America for the creation of a more cordial attitude toward both Italy and Spain.

That Italy was drawing away from France and once more assuming her traditional hostility was evident. On November 16, Mussolini declared that his Government was opposed to further occupations of German territory; on November 30, he indicated that he was sympathetically disposed toward granting Russia *de jure* recognition. By the adoption throughout 1923 of commercial treaties with Spain, Albania, the Baltic States, Russia, Switzerland, Austria, Canada, and Czechoslovakia, it was seen that attempts were being made to shake off the old economic dependences and turn to new sources for raw materials.

The year 1924 opened auspiciously for Fascism. Italy, by the Treaty of Rome, had gained Fiume and was firmly established in the Adriatic. Mussolini's foreign policy continued to meet with triumph after triumph. First Yugoslavia, then Russia (which was granted *de jure* recognition, February 7), then Poland (which was promised, in April, a loan of 400,000,000 lire), then Czechoslovakia (as a result of the treaty of friendship of May 17), were drawn into the Italian European system and the hold of France on central and eastern Europe greatly weakened; also, Mussolini, in June, had come to an amicable understanding with Great Britain over the Jubaland question. (see AFRICA) and negotiations were under way with Rumania for the settlement of the long-standing dispute over the repayment of the Italian loan. In internal affairs, Fascism seemed firmly entrenched. In the election of April 6, the Fascisti polled 65 per cent of the vote cast and returned 375 seats to the new Chamber. The Opposition was hopelessly divided, being made up of 40 for Popular Party, 25 Socialists, 22 Maximalists, 17 Liberals, 17 Communists, 12 for Constitutional Opposition, 11 Social Democrats, 7 Republicans, 3 for Peasant Party, 2 Slavs, 2 Germans, 2 Sardinian autonomists. The new Parliament was opened with the old pomp, May 24, and King, Court, and Mussolini basked in the approbation openly manifested by the Roman populace.

Trouble soon developed. The chief opposition in Parliament was led by the Socialists at whose head stood Signor Matteotti. In June, 1924, Matteotti was murdered after it was rumored that he would uncover instances of graft touching members of Mussolini's cabinet. The murder caused a storm of indignation throughout Italy since it was only the worst case in a series of acts of violence or "squadristism." Mussolini quieted the storm by dismissing those connected with the scandal and by promising various reforms. Hereupon, he proceeded to make himself supreme in Italy by forbidding Parliament to initiate legislation; making the Prime Minister solely responsible to

the King; ordering Parliament to empower him to issue decrees which would have the force of law; establishing complete press censorship; abolishing secret societies, and, in 1926, abolishing all opposition parties.

Further, a law of 1928 vested supreme power in the Fascist Grand Council, controlled by Mussolini. This council was empowered to draft all new legislation, fill its own vacancies, and name the successors both of Mussolini and Victor Emmanuel. By a policy of "purification," all anti-Fascist lawyers and professors were disbarred, and prominent opponents, like Signor Nitti, forced into exile. All children's organizations, even the Catholic Boy Scouts, were suppressed, and replaced by the Balilla organization which includes boys between the ages of 8 and 14. At 14 the boys transfer to the Advance Guard where they receive military training. When they reach 18, some of the members of the Advance Guard are taken in as regular members of the Fascist Party.

In 1926, too, the process whereby Italy was to be converted into a "corporate state" was begun. A law of Apr. 3, 1926, recognized as legal 13 syndicates or associations—6 of employers and 7 of employees, including one of the nonmanual workers. These syndicates were grouped into seven "corporations," each corporation including the employers and workers of the particular industries. Thus, there is the Agriculture Corporation, the Industries Corporation, the Maritime and Aërial Transport Corporation, etc. The same law prohibited strikes and lockouts, and established a labor court to settle disputes. To further improve labor conditions, a "Fascist Charter of Labor" was promulgated April 21, 1927. It asserted the state's undisputed right to exercise complete control over labor and capital and all the forces of production in the interest of the nation, the Fascist state. And then, under a law of May 21, 1928, Italy's transformation into a corporate state was completed by provision for a legislative body based directly on economic representation. According to the terms of this law, all Italy was formed into one single constituency with the right to elect 400 deputies. The candidates, to the number of 800, are nominated by the 13 syndicates, each syndicate nominating a definite number. From this list of 800 nominees, the Fascist Grand Council chooses 400. The Council's list is then submitted to the people who may vote yes or no on the whole list. If a majority of the votes cast is in favor of the list, the 400 men take their seats in the Chamber of Deputies. If a majority of the votes opposes the list, then new elections must be held under a complicated and round-about system. Universal suffrage was abolished and certain qualifications for voters set up. In the first elections held under this new law (March 24, 1919) the list presented by the Government received about 90 affirmative votes out of every 100 votes cast. See FASCISM.

Mussolini continued to follow a strong, and at times blustering, foreign policy. An incessant Italian propaganda campaign for a greater population, together with a host of oblique references to Italian rights in certain areas bordering on the Mediterranean, caused much uneasiness to various statesmen in the Balkans, in North Africa, and elsewhere. A vigorous and oftentimes unreasonable policy of Italianization among the quarter-million Germans in the South Tyrol (see TYROL, SOUTH GERMAN) led to several

protests from Austria, Bavaria, and Germany, notably in 1926 and 1928. This area remains one of the chief sore spots of Europe.

Relations with France approached a breaking point in 1927 over the Garibaldi incident. Garibaldi was an Italian who migrated to France ostensibly because he was hostile to the Fascist régime. But the French police discovered that he was a Fascist secret agent sent by Italy to see what France was doing for Italian émigrés. A break was averted by Briand who preferred to smooth the matter over, and in the same year the two countries came to an agreement over the question of Italian emigration to France. Relations were still further improved in the spring of 1928, when Italy was allowed to share in the international government of the free city of Tangier on the west coast of Morocco.

Mussolini further fortified himself by a number of treaties of conciliation and arbitration concluded with Great Britain, Switzerland, Yugoslavia, Austria, Hungary, Germany, Spain, Rumania, Czechoslovakia, and Albania. The latter country almost became an Italian protectorate in 1925. In that year, President Ahmed Zogu of the Albanian Republic called upon Mussolini for financial aid to help him put down numerous revolts. Italy acquiesced with alacrity and then, in June, 1926, handed Zogu a treaty which would have given her complete control over Albania. Zogu refused to sign at the time, but after another serious revolt in northern Albania, he finally affixed his signature to what became known as the Treaty of Tirana, on Nov. 27, 1926. Under the terms of this treaty, Italy could land troops in Albania whenever Zogu so requested, and Zogu really became but a puppet of Mussolini—much to the chagrin of Yugoslavia. See ALBANIA.

On Feb. 11, 1929, the representatives of the Kingdom of Italy and of the Holy See signed three documents comprising the Lateran Accord which apparently solved the seemingly eternal "Roman question." This question of the relations between the Kingdom and the Pope dated from the occupation of Rome by Italian troops on Sept. 29, 1870. Mussolini, however, realized that the support of the Church was invaluable to the continued dominance of Fascism, and in 1926 he authorized conversations with a Papal representative with a view toward some settlement of the outstanding differences between the Church and the State. As a result of these negotiations, a treaty of reconciliation, a concordat, and a final convention were drawn up and then signed by Mussolini for Italy and

Cardinal Gasparri for the Pope. The Accord set up a sovereign state known as the City of the Vatican, under the exclusive jurisdiction of the Holy See. As a result of this settlement, the Italian government secured the coöperation of the Church in Italy, thus adding materially to the strength of Fascism. A concrete example of this coöperation was afforded in the elections of March, 1929, when the clergy advocated the acceptance of the list of candidates presented by the Fascist Grand Council, and the priests and bishops set an example by going to the polls in large numbers. Moreover, the Fascist Party could now feel fairly safe from attack by the ecclesiastical power—which, in Italy, was a real power.

**IVANOV**, è-vü'növ, VYATCHESLAV I. (1866–). A Russian poet, historian, philologist, and philosopher. Joining the Decadents as a critic and essayist, his first volume of poems, *Guiding Stars*, was published in 1903. He published three later volumes, the last one in 1917. After Pushkin, he was perhaps the greatest mold of the Russian language; in his earlier poems, he used Greek words and syntax to a point of incoherence, but his later works, the majority lyrical, showed no trace of this pedantry. His models were Pushkin, Dante, Petrarch, and especially Goethe. The sonnet was his favorite poetic form. Besides verse, he wrote essays and tragedies. Consult *The Path of the Modern Russian Stage and Other Essays*, by Alexander Bakshy (trans. 1926).

**IVOGÜN**, MARIA (1891–). A Hungarian coloratura soprano, born in Budapest. In 1907 she became a pupil of Irene Schlenner-Ambros at the Vienna Akademie, where Bruno Walter discovered her and secured her engagement for the Mozart Festival in Munich in 1913, at the Staatsoper. Her extraordinary success led to a permanent engagement there and she remained until 1925. Richard Strauss was so much impressed with the rare beauty of her voice and the flawless technical execution that he rewrote the difficult coloratura rôle of Zerbinetta in his *Ariadne auf Naxos* and engaged her for the première of the revised version in Vienna (1916). He even made her engagement as guest a condition for all performances of that work in all Austrian and German theatres. In that rôle, she made her London début in 1924. Her American début was made with the Chicago Opera Company as Rosina in Rossini's *Barbiero di Siviglia* (Jan. 14, 1922). Her success as a concert singer has been equally remarkable. In 1921 she married the tenor, Karl Erb.

# J

**JACKSON, A (BRAHAM) V (ALENTINE) WILLIAMS** (1862- ). An American Orientalist (see VOL. XII), professor of Indo-Iranian languages at Columbia University since 1895. He traveled in India, Persia, and Central Asia between 1901 and 1918. In 1926 he again made a journey of research in India, Afghanistan, Baluchistan, and Eastern Persia. He is editor of a *History of Persia* and, among other works, of *Early Persian Poetry* (1920).

**JACKSON, CHEVALIER** (1865- ). An American laryngologist, born at Pittsburgh, Pa. He obtained his medical degree at Jefferson Medical College in 1887 and was appointed professor of laryngology in the University of Pittsburgh, resigning in 1916 to accept the chair of laryngology at Jefferson Medical College. He was also professor of bronchoscopy and esophagoscopy at the University of Pennsylvania. Dr. Jackson is one of the pioneers in the new development of laryngology known as tracheo-bronchoscopy, having studied under Professor Kilian of Germany, the inventor of the bronchoscope, an instrument which is of great value not only in diagnosis but in the location and removal of foreign bodies in the deep air-passages. He has been a prolific contributor to periodical literature in various subjects which pertain to laryngology, bronchoscopy, rhinology, otology, etc. His first textbook, *Tracheobronchoscopy*, appeared in 1907; *Peroral Endoscopy and Laryngeal Surgery* in 1914; and *Bronchoscopy and Esophagoscopy* in 1922. In 1923, there appeared in French the volume *Endoscopie et chirurgie du larynx*.

**JACKSON, FREDERICK JOHN FOAKES** (1855- ). A British-American theologian, born at Ipswich, England. He graduated from Trinity College, Cambridge, in 1879, and was fellow of Jesus College from 1886, and dean and assistant tutor at the same college from 1893 to 1916. In the latter year, he was appointed Briggs graduate professor of Christian institutions at the Union Theological Seminary. In 1916 he was also Lowell lecturer in Boston. He was a member of several learned societies and was the author of *The Christian Church* (1891); *Biblical History of the Hebrews* (1903); *St. Luke and a Modern Writer* (1916); *Introduction to Church History* (1921); *Anglican Church Principles* (1924); *Studies in the Life of the Early Church* (1924); *Life of St. Paul* (1926); *Rise of Gentile Christianity* (1927); *Peter, Prince of Apostles* (1927). He also edited several theological works.

**JACKSON, HENRY EZEKIEL** (1869- ). An American clergyman and author, born in Chester County, Pa., and educated at Lafayette College and Princeton Theological Seminary. He was ordained to the Presbyterian ministry in 1896, and after holding several pastorates, the Community Organization of the United States Bureau of Education at Washington, D. C., secured his services as special agent, which

post he held from 1916 to 1920. He became president of the National Community Board at Washington, D. C., and later president of the Social Engineering Institute of New York. His writings include: *Benjamin West, his Life and Work* (1900); *Great Pictures as Moral Teachers* (1910); *The Legend of the Christmas Rose* (1914); *The New Chivalry* (1915); *A Community Center, What It is and How to Organize It* (1918); *The League of Nations* (1919); *A Community Church* (1919); *What America Means to Me* (1920); *Robinson Crusoe, Social Engineer* (1922); *The Thomas Jefferson Bible* (1923).

**JACKSONVILLE.** A city of Florida. The population increased from 57,699 in 1910 to 91,558 in 1920 and to 140,700 in 1928, by estimate of the Bureau of the Census. A new charter was granted by the State Legislature in 1917 providing for an elected council of 21 members and a commission of five members. The mayor is elected for two years. In 1921 a bridge 3800 feet long with a vertical lift draw was built across the St. Johns River at a cost of \$1,250,000. The city owns and operates its electric-light plant, thereby offering one of the lowest electric-light rates in the South. Through its natural harbor, which has a 30-foot channel depth at low water, Jacksonville carries on an extensive deep-sea and foreign commerce. Its total foreign commerce in 1927 was 494,429 tons.

Jacksonville is the financial, manufacturing, and jobbing centre of the State and next to the largest naval-stores market in the world. It has more than 400 manufacturing establishments that produce commodities valued at approximately \$142,000,000 annually. Some of the major industries are naval stores, lumber and wood products, fertilizers, cigar manufacturing, coffee roasting, shipbuilding, and steel and stone products. The resources of Jacksonville's 10 banks in 1927 were \$96,764,600; the deposits were \$86,120,449. The assessed valuation of property in 1928, according to local estimate, was \$99,004,820. All property is assessed on a basis of 50 per cent of the fair market value, the city tax rate being 24.5 mills. The net debt in 1927 was \$14,939,000.

**JACOBI, FREDERICK** (1891- ). An American composer, born in San Francisco. He studied in New York, piano under Gallico and Joseffy, and composition under R. Goldmark and E. Bloch. During 1912-17 he was assistant conductor at the Metropolitan Opera House. His works include *Assyrian Symphony*; a symphonic poem, *The Pied Piper*; a symphonic prelude, *The Eve of St. Agnes*; an orchestral suite, *California*; *Festival Prelude*; *Nocturne*, for string quartet; and a string quartet on Indian themes.

**JACOBS, THORNWELL** (1877- ). An American educator, born at Clinton, S. C. He was graduated from the Presbyterian College, Clinton, S. C., in 1894, and from Princeton Theological Seminary in 1899. In the same year, he was

ordained to the Presbyterian ministry and was pastor in North Carolina for several years following. In 1915 he founded at Atlanta, Ga., Oglethorpe University, and was its president from that date. He is the author of *The Law of the White Circle* (1908); *Midnight Mummer*, poems (1911); *The Oglethorpe Story* (1916); *Life of Plumer Jacobs* (1918); *The New Science and the Old Religion* (1927); *Islands of the Blessed* (poems, 1928).

**JACOBS, WILLIAM WYMARK** (1863- ). An English novelist and writer of short stories of the sea (see VOL. XII). His later novels include *The Castaways* (1916); *Deep Waters* (1919); and *Sea Whispers* (1926). He also wrote, in collaboration, *The Monkey's Paw* and other plays.

**JACOBSON, YÄ'KÖP-SÖÖN, SIEGFRIED** (1881-1926). A German writer. He was born in Berlin and studied at the university there. He became dramatic critic of *Die Welt am Montag* and in 1905 founded his own magazine devoted to the drama, *Die Schaubühne* (changed in 1918 to *Die Weltbühne*), through which he exercised considerable influence over the theatrical life of Germany. He was also dramatic correspondent for *Die Zeit* and other Viennese papers. He wrote *Das Theater der Reichshauptstadt* (1904); *Mao Reinhardt* (1910); *Der Fall Jacobsohn* (1913); and *Die ersten Tage* (1917).

**JACOBY, HENRY SYLVESTER** (1857- ). An American engineer, born at Springtown, Pa. He was graduated from Lehigh University in 1877. During 1879-85, he was chief draftsman in the United States Engineer's Office in Memphis, Tenn. In 1886 he returned to Lehigh, where until 1890 he was instructor of civil engineering; he then accepted a call to Cornell, where in 1897 he became professor of bridge engineering. He retired in 1922. Besides numerous papers on his specialty of bridge engineering, he wrote *Notes and Problems in Descriptive Geometry* (1892); *Outlines of Descriptive Geometry* (part 1, 1895; 2, 1896; 3, 1897); *Text Book in Plain Lettering* (1897); with Mansfield Merriman, *Text Book on Roofs and Bridges* (1890-98); with R. P. Davis, *Foundations of Bridges and Buildings* (1914); and *Structural Details, or Elements of Design in Timber Framing* (1919).

**JADWIN, EDGAR** (1865- ). An American military engineer and army officer (see VOL. XII). He held the temporary rank of brigadier general in the World War and organized and commanded the 15th U. S. Engineers, the first American regiment to pass under arms through England in 1917. He was at first director of light railways and roads for the A. E. F. in France and later directed a general construction programme employing 160,000 men. He was a member of the American Mission to Poland and observer in Ukraine in 1919. Returning to the United States, he became engineer of the 8th Corps Area at San Antonio, Tex. (1920-22), division engineer of the Southeast Division at Charleston, S. C. (1922-24), assistant to the Chief of Engineers, with the rank of brigadier general (1924-26), and in 1926, Chief of Engineers with the rank of major general. In that capacity, he formulated the Mississippi River flood-control plan that bears his name. He was retired Aug. 7, 1929, with the rank of lieutenant general. He was senior member of the American section, Joint Engineering Board, St. Lawrence Waterway Project.

**JAENSCH, ERICH R. F.** (1883- ). A German philosopher and director of the psychological institute and philosophical seminary at Marburg. He strove for a closer relation between philosophy and psychology and has written among other works *Einige allgemeine Fragen der Psychologie und Biologie des Denkens* (1920).

**JAGGAR, THOMAS AUGUSTUS** (1871- ). An American geologist, born in Philadelphia, Pa. He was graduated at Harvard in 1874, (Ph.D. in 1897) and also studied at Heidelberg and at Munich. In 1895 he became an instructor and later assistant professor of geology at Harvard. In 1906 he accepted a call to the Massachusetts Institute of Technology, where he was professor of geology (1904-17) and head of the Department (1906-12). During 1898-1904 he also served the United States Geological Survey as an assistant geologist. He was director of the Hawaiian Volcano Observatory (1912-19) and in 1919 became volcanologist to the United States Weather Bureau, stationed in Hawaii. He has studied the volcanoes of the Aleutian Islands, Hawaii, Japan, Italy, New Zealand, and Central America, to most of which he has made expeditions and descriptions of which he has published. Since 1926 he has been chief of the section of volcanology of the U. S. Geological Survey. In 1928 he led the National Geographical Society's Paulof expedition.

**JAGGER, CHARLES SARGEANT** (1885- ). A British sculptor, born in Yorkshire and trained at Sheffield and the Royal College of Arts. His works include the British memorial to Belgium in Brussels; the Royal Artillery memorial, Hyde Park Corner, London; the Great Western Railway memorial, Paddington Station; a statuette of the Prince of Wales. In 1924 he was awarded the Rome Prize in sculpture and in 1926 the gold medal of the Royal Society of British Sculptors.

**JAGIC, YŪ'GICH, VATROSLAV** (1838-1923). An Austrian philologist (see VOL. XII). His recent works are *Beitrag zur Erforschung der altkirchenslavischen Evangelientexte: Evangelium Bucovinense* (1916) and *Zum altkirchenslavischen Apostolus* (1919-21). He also edited *Johannes Paprek's Slavische Brautwerbungs- und Hochzeitsebräuche* (1914).

**JAGOW, YÄ'GÖ, GOTTLIEB VON** (1863- ). A German diplomat (see VOL. XII). He was State Secretary for Foreign Affairs from 1913 to 1914, and was retired in 1916. He added to the literature of the World War with his *Ursachen und Ausbruch des Weltkrieges* (1919).

**JAHN, YÄN, GEORGE MAX** (1885- ). A German political economist, professor at the University of Halle since 1924. He was born in Leipzig and studied history, philosophy, and political science at the universities of Leipzig and Jena. He was director of the municipal high school for girls in Jena and lecturer on political economy at Leipzig and at the technical high school of Braunschweig. He is the author of: *Die Gewerbepolitik der deutschen Fürsten vom 16. bis zum 18. Jahrhundert* (1909); *Verstaatlichung und Vergesellschaftung* (1919); *Grundzüge der Volkswirtschaftslehre* (1920); *Sozialpolitik* (1926); and *Der Studienplan der Nationalökonomie* (1927).

**JALOUX, EDMOND** (1878- ). A French novelist who was born in Marseilles. In 1927 he became editor of the *Revue des arts asiatiques*. In 1920 he won the Grand Prix de Littérature. His works include: *L'Agonie de*



*l'amour* (1899); *Les Sangsues* (1904); *Le jeune homme au masque* (1905); *L'École des mariages* (1907); *Le Démon de la vie* (1908); *Le Reste est silence* (1909); *Le Boudoir de Proserpine* (1910); *L'Éventail de Crêpe* (1911); *Fumées dans la campagne* (1915); *L'Incertaine* (1918); *Les Amours perdues* (1919); *Vous qui faites l'endormie* (1920); *L'Ennemi des femmes* (1921); *L'Escalier d'or*; *Les profondeurs de la mer*; *Les Barricades mystérieuses*; *Le Roi Ophétua* (1922); *Le coin des cyprès* (1925); *Pierre Laprade*, a critical study (1925); *O toi que j'cusse aimée!* (1926); *Soleils disparus* (1927); *La branche morte* (1928); and a volume of literary criticism, *De Pascal à Barrès*.

**JAMAICA.** An island of the British West Indies; area 4450 square miles; population in 1921, 858,118 and in 1927, 953,768. According to the census of 1921, the East Indian population was 17,494, as compared with 17,380 in 1911, and the Chinese 3696, as compared with 2111. Kingston, the capital, had 62,707 inhabitants in 1921 and 57,379 in 1911. The leading activity of the population is agriculture. Sugar cane is of great importance, the acreage under cane being 43,605 in 1927-28 (31,753 in 1912-13). Other crops with their acreage in 1927-28 are (1912-13 figures in parentheses): bananas, 88,974 (81,071); coffee, 19,195 (22,275); coconuts, 39,070 (17,377); cocoa, 4782 (11,236); ground provisions, 50,238 (99,632). The values of imports in 1912 and 1927-28, were, respectively, £3,040,500 and £6,001,768. Exports for the same years were valued at £2,709,283 and £4,257,750. There has been no change in administration. Women were enfranchised in 1919. Government accounts for 1927-28 follow (1912-13 figures in parentheses): revenue, £2,275,094 (£1,432,400); expenditure, £1,980,888 (£1,549,667); public debt, £4,922,330 (£3,843,974).

**JAMES, HERMAN GERLACH** (1887- ). An American lawyer and author, born at Philadelphia, Pa. He was graduated from the University of Illinois in 1906 and studied law at the Harvard Law School. In 1909 he was admitted to the bar and after official service in Santiago, Chile, was lecturer at the University of Leipzig in 1911. From 1912 to 1925, he was professor of government in the University of Texas. He was a research associate of the Carnegie Institution of Washington to study Brazilian government, 1922-23, and since 1925 has been professor of political science and dean of the college of arts and sciences, University of Nebraska (dean of the graduate college since 1926). He was the author of *A Handbook of Civic Improvement* (1915); *Municipal Functions* (1917); *Local Government in the United States* (1921); *The Constitutional System of Brazil* (1923); and *Brazil after a Century of Independence* (1925). He was editor of the *Southwestern Political Science Quarterly*, 1923-25.

**JAMES, MONTAGUE RHODES** (1862- ). A British classicist, who was educated at Eton and King's College, Cambridge. He was director of Fitzwilliam Museum (1894-1908), provost of King's College (1905-18), vice chancellor (1913-15), and Schweich lecturer before the British Academy (1927). He compiled catalogues of the manuscripts at Peterhouse, Trinity (4 vols.), Emmanuel, Pembroke, Clare, Christ's, and Queens colleges, Gonville and Caius College (2 vols.), Corpus Christi College (7 parts), St. John's College, and various other public and private collections. Other publications include *Ancient*

*Libraries of Canterbury and Dover* (1903); chapters in the *Cambridge Modern History*, the *Cambridge History of English Literature*, *Cambridge Medieval History*, and *Medieval France*; *Biblical Antiquities of Philo* (1927); *The Apocryphal New Testament* (1924); *Life of St. Alban* (1924); *The Carew MSS.* (1927); *Eton and King's, 1875-1925*, and many other translations and descriptions of ancient documents.

**JAMESON, JOHN FRANKLIN** (1859- ). An American historian (see Vol. XII). He retired as director of the department of historical research of the Carnegie Institution of Washington and also as managing editor of the *American Historical Review*, in 1929. Since 1929 he has been connected with the Manuscripts Division of the Library of Congress. He projected the *Dictionary of American Biography*. He wrote *Privateering and Piracy* (1923) and *The American Revolution Considered as a Social Movement* (1926).

**JAMMES, FRANCIS** (1868- ). A French poet and novelist, born in Tournay (Hautes-Pyrénées). His prose was almost as poetic as his verse, and in both he was usually a chronicler of the country side. *Feuilles dans le vent* (1914) contained the best of his first-period poetry. His other poetry includes *Clairières dans le ciel* (1906); *Géorgiques chrétiennes* (3 vols., 1911-12); *Oeuvres de Francis Jammes*, some of his poetry (1913); *La vierge et les sonnets* (1919); *Épithèses* (1921); *Le tombeau de Jean de la Fontaine*, followed by *Poèmes mesurés* (1921), and *Quatrains* (3 vols., 1923-24). His novels and other prose include *Clara d'Ellébeuse* (1899); *Le roman du lièvre* (1903); *Ma fille Bernadotte* (1910); *Le rosaire au soleil* (1916); *M. le curé d'Ozéron* (1918); *Le poète rustique* (1920); *Le livre de Saint Joseph* (1921); *Mémoires* (3 vols., 1921-23); *Cloches pour deux mariages* (1923); *Brindilles pour rallumer la foi* (1925); *Ma France poétique* (1926); *Cardinal Lavigerie* (1928); and *Divine douleur* (1928). In 1925 his works were published in two volumes. Consult *Six French Poets*, by Amy Lowell (1915); *Les chapelles littéraires: Claudel, Jammes, Péguy*, by Pierre Lasserre (1920); *Choix de poèmes*, with a study, by Leon Moulin (1922); and *Francis Jammes*, by E. Pilon (1924).

**JANÁČEK, LEOS** (1854-1928). A Czech composer, born at Hukvaldy, Moravia. He received his musical education at the Organ School in Prague and at the conservatories of Leipzig and Vienna. After unsuccessful efforts to win a reputation as a piano virtuoso, he settled in 1881 in Brünn, as conductor of the Philharmonic Society. In the same year, he opened there his own Brünnner Orgelschule and in a short time he was recognized as a teacher and choral conductor of exceptional ability. When the Brünn Conservatory was founded in 1919, he became professor of composition there, retaining that post until his death. In 1884 he wrote his first opera, *The Beginnings of a Romance*, followed, in 1887, by *Sarka*. Unable to secure their performance, he became discouraged and turned to the composition of choral works, which immediately found great favor with his countrymen and established his reputation as the foremost national composer. For almost twenty years, he made no further attempts at opera, until the very effective text of *Jenufa* aroused his interest. However, the premiere of this work at Brünn, in 1904, passed almost unnoticed, and during the

next 12 years only sporadic performances on provincial stages can be recorded. But when *Jenufa* was heard at Prague, in 1916, it scored an overwhelming success, so that from then on the composer devoted his energies chiefly to the stage. After numerous productions in Austria and Germany, *Jenufa* was produced at the Metropolitan Opera House, New York, (Dec. 6, 1924), but failed to make an impression. Janáček's musical idiom is, in the main, impressionistic, with a strong admixture of Czech folk elements producing a certain individuality. The operas following *Jenufa* are: *Fate* (written 1905, not produced); *The Adventures of Mr. Bruck* (two parts: *Mr. Bruck's Excursion to the Moon*, and *Excursion into the Fifteenth Century*, Prague, 1920); *Katya Kabanova* (Brünn, 1921); *The Sly Little Viven* (Brünn, 1924); *Sarka* (written 1887; Prague, 1925); *The Makropulos Case* (Prague, 1926), and *The House of the Dead* (completed just before his death, not yet produced). The principal non-dramatic compositions are the choral works with orchestra, *Amarus, Our Father, The Eternal Gospel*; the symphonic poems, *The Musician's Child, Taras Bulba*, and *The Ballad of Blanik*; *Sinfonietta*; a string quartet; a sextet for woodwind; male choruses; a cycle of 22 songs, *The Day-Book of One Who Vanishes*; piano pieces and songs.

**JANET**, zhá'ná', PIERRE (1859- ). A French psychologist, born in Paris. Like Freud, he was the pupil of the great French alienist, Charcot, but he developed the latter's theories along lines much more sober than those of his Viennese colleague. After teaching philosophy in a lycée at Le Havre, he began to devote himself to a clinical observation of psychopathic cases. His first work, *L'Automatisme psychologique* (1889), singled him out as a leader in this field. Then followed in succession researches on hysteria, *L'Etat mental des hystériques* (2 vols., 1893) and on neuroses, *Névroses et idées fixes* (2 vols., 1898). On the death of Ribot, he succeeded to the latter's chair at the Collège de France (1896), and in 1903 he founded the *Journal de Psychologie*, which he directed. He was elected in 1918 to the Académie des Sciences Morales et Politiques. Professor Janet made two visits to the United States. On his first visit, he delivered a course of lectures on *The Major Symptoms of Hysteria* (published 1908).

Without building a system, M. Janet oriented his psychology around the notion of a hierarchy of states of consciousness, ranging from conscious reflection to a biological automatism that is almost indistinguishable from the mechanism of a machine. No attempt is made to "construct" consciousness, but all analyses are made from within conscious experience.

Besides the works mentioned above, his works include *Les Obsessions et la psychasténie* (2 vols., 1903); *Les Névroses* (1909); *Les Médications psychologiques*, translated as *Psychological Healing* (3 vols., 1919-21); *La Médecine psychologique*, translated as *Principles of Psychotherapy* (1923); and *De l'angoisse à l'extase*, Vol. 1, *Un délire religieux, la croyance* (1926), Vol. II, *Les sentiments fondamentaux* (1928). See **PSYCHOLOGY, ABNORMAL**.

**JANEWAY**, THEODORE CALDWELL (1872-1917). An American physician, son of the late Dr. E. G. Janeway. He was born in New York City, took his bachelor's degree at Yale and re-

ceived his medical degree from Columbia (College of Physicians and Surgeons) in 1895. He followed in the footsteps of his father as diagnostician and consultant, was visiting physician to St. Luke's Hospital and in 1907 became professor of the practice of medicine at the College of Physicians and Surgeons, resigning in 1914 to occupy the chair of medicine at Johns Hopkins, where he was also physician in chief of the University Hospital. Dr. Janeway did much to promote the study of blood pressure. His only publication in book form is *Clinical Study of the Bloodpressure* (1904).

**JANIS**, (BIERBOWER), ELSIE (1889- ). An American actress born in Columbus, Ohio. She first appeared on the stage as Cain in *The Charity Ball* (1897); played in vaudeville (1898-1903); then starred in *The Belle of New York* (1904). She appeared later in *The Fortune Teller* and *The Duchess*, and starred in *The Vanderbilt Cup* (1906-08). Under the management of Charles B. Dillingham, she took the leading rôle in *The Hoyden*, *Fair Co-ed*, *The Slim Princess*, and also in *Elsie Janis and Her Gang* (1920), of which she is the author. A revue by Miss Janis, *Puzzles of 1925* was produced in New York.

**JAN MAYEN ISLAND**. Located at about 71° north latitude and 8° west longitude, this desolate isolated island of only 142 square miles is dominated by the semi-active, ice-clad volcano, Beerenberg. Probably known to the Norsemen, Jan Mayen was a centre for Dutch whaling activities in the early part of the seventeenth century. After the extinction of local whaling, only occasional explorers visited the island until 1921 when Norway established a wireless and meteorological station to aid in forecasting storms on the mainland. Jan Mayen is considered by Norway to be within her sphere of interest.

**JANSON**, yā'n'son, KRISTOFER NAGEL (1841-1917). A Norwegian author (see VOL. XII). Among his last works were: *Aspasia*, novel (1914); *Norske Eventyr som taletikster* (1915), and *Mangeslags kjaerlighed*, published in 1923.

**JANTZEN**, HERMANN (1874- ). A German writer, who was born at Breslau and studied at the university of that city. He was director of the Victoria Institut of Breslau (1900-05), then went in the same capacity to the Königin Luise Institut at Königsberg. His works include: *Geschichte des deutschen Strikedichts im Mittelalter* (1896); *Gotische Sprachdenkmäler* (1898); *Saxo Grammaticus* (1901); *Deutsche Literaturgeschichte* (1904); *Königin Luise* (1910); *Ostpreussische Sagen* (1912); *Von deutscher Schule und Erziehung* (1915); *Ueber Erziehung und Unterricht* (1918); *U. S. A. Poetry and Prose*, an anthology (1923); *Ein altschlesisches Osterspiel* (1925); *Hartmann von der Aue und Gotfried von Strasburg* (1925); *Wolfram von Eschenbach* (1925). He also edited: *Literaturdenkmäler des 14. und 15. Jahrhunderts* (1903); *Goethe's Egmont* (1914); *Hobbel's Nibelungen* and *Agnès Bernauer* (1919).

**JAPAN**. An Empire of the Far East. It consists of Japan proper, made up of the islands of Honshu (mainland), Shikoku, Kyushu, and Hokkaido (Yezo), and of Chosen (Korea), Taiwan (Formosa), Karafuto (Sakhalin), as well as 600 smaller islands, including the four archipelagoes, the Pescadores, Agasawara (or Bonin group), Okinawa (or Linchu group), and Chishima (or Kuriles). The total area is 265,129

square miles. The total population of Japan, according to the census of 1925, was 83,456,629, an increase from 76,988,379 in 1920, distributed as follows: Japan proper, 59,736,822; Formosa, 3,993,408; Karafuto, 203,754; Korea, 19,524,945. The population of Japan proper at the end of 1926 was 83,006,595, or a density of population of 428 to the square mile. About one-sixth of the land is under cultivation, and the population is predominantly rural. According to the census of 1920, 41 per cent of the people live in villages of between 2000 and 5000 inhabitants, 19 per cent in towns of between 5000 and 10,000 inhabitants, and 9 per cent in towns of between 10,000 and 20,000 inhabitants. Only 12 per cent of the population were in cities of over 100,000 inhabitants. In 1926 there were 640,099 Japanese residing abroad: 267,191 in Asia; 3360 in Europe; 229,734 in America; and 148,734 in Oceania, principally in the Hawaiian Islands. Principal cities with population in 1925: Tokyo, 1,995,567; Osaka, 2,114,804; Kobe, 644,212; Nagoya, 768,558; Yokohama, 405,888; and Kyoto, 679,963.

**Agriculture.** In 1926 there were in Japan, out of a total area of 94,289,000 acres, 7,269,000 acres of rice fields, 6,765,000 acres of upland farms, 4,099,000 acres of moors and pastures, and 20,980,000 acres of forests. All agricultural statistics here presented are for Japan proper unless otherwise noted. Agricultural conditions were more favorable in 1927 than in the previous year. The rice crop, by far the most important, was officially estimated at 317,952,000 bushels of brown rice (550,175,000 bushels of rough rice) an increase of 11.7 per cent, compared with 1926, 7.6 per cent above the five-year average, and the largest crop since 1920. The production of rice in Chosen and Taiwan also showed an increase over 1926. The wheat crop was larger than the year before, but production of barley showed a decrease, partly on account of reductions in area planted. Under normal conditions, large crops in Japan tend to increase the purchasing power of the landlords and farmers who constitute approximately one-half of the total population. Returns from agriculture in 1927 were greatly reduced, however, as farmers had difficulty in financing their crops because of a bank crisis and were forced to sell at low prices.

The production of silk cocoons was 610,275,000 pounds in 1924; 701,060,000 pounds in 1925; 717,350,000 pounds in 1926; and 753,309,000 pounds in 1927. On Dec. 31, 1926, there were in Japan proper, 1,465,000 cattle, 621,000 swine, 18,000 sheep, 179,000 goats, and 1,444,000 horses.

copper, \$23,921,000; coal, \$108,867,000; crude petroleum, \$7,055,000.

MINERAL AND METAL PRODUCTION (Japan Proper)			
Product		1913	1926
Gold	troy ozs.	178,075	292,519
Silver	1000 troy ozs.	4,702	4,477
Copper	met. tons	66,501	67,865
Pig iron *	1000 met. tons	240	1,179
Steel ingots *	"	305	1,499
Iron pyrites	met tons	114,576	417,513
Coal	1000 met. tons	21,316	31,427
Crude petroleum	1000 bbls.	1,922	1,698
Sulphur	met. tons	59,448	47,775

\* Including the production in Chosen and Manchuria.

**Fisheries.** The annual catch of Japan is valued at about 250,000,000 yen. In 1926 the total catch was valued at 227,291 yen, while manufactures of fish amounted in value to 183,204 yen, including edible preparations, fish manure, and fish oil.

**Industries.** The industrial population of Japan was slightly over 5 per cent of the total adult labor power of 31,000,000, amounting in 1921 to 1,686,353 people and 916,252 in 1913. Of this 1921 total, 945,788 were engaged, as against 609,638 in 1916, in textile factories; 249,102 in machine and tool factories, compared with 146,477 in 1916; 171,249 in chemical works and 105,139 in 1916; 143,554 in breweries, tea-drying establishments, flour and rice mills, compared with 44,908 in 1916; and 154,908 in printing, woodenware, gas and electric works, and foundries, compared with 79,188 in 1916. Government works employed 15,752 in 1921, a tremendous reduction from 157,902 in 1916, most of whom were in military factories. Wages paid laborers ranged in 1921 from 40 cents per day paid female silk spinners to \$1.50 per day for bricklayers. In 1913 the former were paid 14 cents per day and the latter 55 cents. Japanese labor was relatively inefficient compared with European and American labor, four or five persons being required, as a rule, to do the work of one skilled Western workman. Hydroelectric power is of large and growing importance in Japanese industry. The potential water-power resources, developed and undeveloped, in Japan, are estimated at 4,500,000 horse power. The capacity of water wheels and turbines in central electric plants in 1926 was 1,082,000 horse power, in factories, 21,000, and in mines 80,000 horse power, representing one-third the total capacity of prime movers in these three classes of establishments, which amounted

#### CROPS: AREA, PRODUCTION, AND YIELD PER ACRE (Japan Proper)

Crop	Area (thousands of acres)				Production (thousands of units—bushels except as indicated)			
	1909-1913	1921-1925	1926	1927	1909-1913	1921-1925	1926	1927
Wheat	1,179	1,197	1,146	1,159	23,635	26,903	28,430	29,248
Rye	1,683	1,440	...	...	39,993	34,860	...	...
Barley	3,189	2,630	2,431	2,343	95,786	82,994	88,078	71,559
Oats	110	278	269	...	4,928	10,848	10,764	...
Rice	7,299	7,705	7,740	7,777	445,205	510,640	492,505	550,175
Tea	120	110	109	106	70,729 *	78,772 *	79,862 *	81,497 *
Tobacco	97	94	91	91	93,716 *	141,675 *	132,278 *	147,986 *

\* Unit, pound.

**Minerals.** The total value of mineral products in Japan proper has been as follows: 1913, \$72,719,000; 1925, \$175,687,000; 1926, \$200,710,000. The value of the leading mineral products in 1926 were: Gold, \$6,016,000; silver, \$2,838,000;

to 3,271,000 horse power. Nearly all the water power and much of the steam power is applied electrically, the capacity of electric motors in electric plants, factories, and mines, in 1926, being 2,681,000 horse power.

PRINCIPAL MANUFACTURED PRODUCTS (Japan Proper)					Value (thousands of dollars)			
Product		Quantity	1914	1926	Product	1914	1925	1926
Cotton yarn	1000 lbs.	726,001	908,763	1,043,097	Cotton fabrics	57,799	288,521	350,250
Spun silk	"	1,647	8,752	.....	Silk fabrics	27,189	99,633	110,251
Wheat flour	met. tons	226,889	652,276	.....	Woolen fabrics	13,665	75,910	96,715
Crude camphor *	1000 lbs.	1,817	3,530	2,597	Porcelain earthenware	7,725	32,082	34,855
Camphor oil *	"	2,237	3,280	4,503	Vegetable oil	8,203	18,640	20,843
Cigarettes	millions	7,687	28,331	25,960	Mats and matting	3,694	11,904	10,682
Tobacco, cut	1000 lbs.	58,266	52,243	52,218	Lacquered wares	4,811	12,697	14,331
Sake	1000 gals.	192,541	276,171	276,168				
Printing paper	1000 lbs.	131,297	775,978	808,140				

\* Years ended Mar. 31.      \* 1915.

**Communications.** In 1927 Japan had 185,256 miles of telegraph, and 2,165,243 miles of telephone wire in operation, all under government ownership, compared with 121,677 miles of telegraph and 503,302 miles of telephone in 1914. Japanese-owned cables connected Japan with China, Siberia, the Philippines, Guam, and the outlying possessions in the Pacific. Danish and American-owned cables entered Japan, but the Government operated the radio stations. Japan had 300,000 miles of roads, but few were highways wide enough to permit use of automobiles, most of them being built for narrow-tread native carts and rickshaws. The 351,000 bridges, except those on the 1600-mile Tokkaido highway, extending from Nagasaki to Tokyo, and a few other wide roads, were mostly too narrow and too light for motor vehicles. An extensive programme of road construction along standard specifications was under way. There were 11,345 miles of railway in Japan in 1927, 3337.58 miles, mostly short lines, being privately owned, and the balance, mostly trunk lines, being government owned. Only a few miles were as yet electrified. In 1913 there were 5987 miles of railroad. There were in 1927 2042.11 miles of municipal and private electric tramway lines. Canals are important only in the areas around Tokyo and Osaka, which are located on plains near shallow bays. Canal systems in these cities are important transportation factors.

**Shipping.** In 1927 Japanese steamer tonnage amounted to 4,033,304 compared with 1,513,000 tons in 1913 and sail tonnage to 1,259,934 compared with 487,000 tons in 1913. After 1920, Japanese shipping was greatly affected by decrease in tonnage which had fallen to Japanese ships as a result of withdrawals of European ships during the War. In 1922, 13,451 steamers and 447 sailing vessels entered Japanese ports, representing 35,795,276 and 65,037 tons, respectively. During the same year, 13,421 steamers and 489 sailing vessels cleared, representing 35,556,897 and 69,561 tons, respectively. In 1927, 16,899 steam vessels of 49,294,455 net registered tons and 126 sailing vessels of 17,819 tons entered Japanese ports. In the same year 17,031 vessels of 49,811,000 tons cleared the ports of the country.

**Foreign Trade.** In 1927 Japan's foreign trade amounted to \$1,981,448,735, or \$96,991,086 less than the 1926 figure. Exports during 1927 totaled \$946,350,653, against \$961,022,109 in 1926, while imports were valued at \$1,035,089,082, against \$1,117,417,712 in 1926—thus developing a decrease of 7.4 per cent in imports and 1.5 per cent in exports as compared with the preceding year. The leading exports in order of value in 1927 were raw silk, cotton and silk textiles, cotton yarn, and fish; the leading imports, raw cotton, iron and steel, lumber, wool, and oil cake. Japan's exports to the United

States during 1927 amounted to \$396,057,022 against \$404,613,872 in 1926, and imports from the United States were valued at \$320,000,805 as compared with \$319,687,308 in 1926.

**Finance.** Because of the failure to pass a budget law for 1928-29, the 1927-28 budget providing for a total expenditure of over 1,730,000,000 yen was to be in force for another year. There was also a supplementary budget of 16,000,000 yen provided to cover the expenses of the Emperor's coronation. The national debt increased about 4 per cent during 1927, entirely in internal debt. On Mar. 31, 1928, the total debt was 5,397,866,581 yen (equivalent at par to \$2,689,000,000). The state revenues estimated for 1928-29 were 1,484,305,834 yen ordinary receipts and 301,163,679 yen extraordinary receipts, while ordinary expenditures were 1,199,986,070 yen and extraordinary 509,139,579 yen. The table shows receipts and expenditures for earlier years.

#### GOVERNMENT RECEIPTS AND EXPENDITURES (Thousands of Yen)

	1913-14,	1925-26,	1927-28,
	actual	actual	estimated
<b>Ordinary receipts</b>	575,428	1,443,235	1,458,151
Income tax	35,991	234,972	224,160
Land and business tax	102,029	140,405	117,906
Customs	73,722	111,161	127,413
Liquors, sugar, and textiles	134,288	345,458	348,954
Stamp receipts	30,831	91,530	81,469
All other taxes	23,900	62,813	64,824
Posts, telegraphs, and telephones (gross)	57,904	209,619	240,549
Monopolies (net)	69,298	153,029	160,508
Other public enterprises	21,810	62,965	62,725
All other	26,105	31,283	29,646
<b>Extraordinary receipts</b>	146,547	628,134	300,818
<b>Ordinary expenditures</b>	415,636	1,016,289	1,184,526
Debt service	142,627	221,462	290,336
Army and navy	116,037	293,003	309,592
Public instruction	9,597	79,198	119,218
Communications (gross)	61,530	254,717	279,579
All other	85,845	167,909	185,801
<b>Extraordinary expenditures</b>	157,998	508,699	574,444
<b>Equivalent (\$1000) at par:</b>			
Ordinary receipts	286,851	719,453	726,888
Ordinary expenditures	207,195	506,620	590,486
Extraordinary receipts	73,054	313,125	149,958
Extraordinary expenditures	78,762	253,586	286,360

**Effects of the Earthquake.** On Sept. 1, 1923, Japan was visited by one of the greatest catastrophes in history. An area 50 miles square was completely devastated by an earthquake and a much larger area severely affected; most of the buildings were injured or destroyed, and many were burned, while the rails on the railway were twisted and telephone and telegraph wires were thrown down. The total losses were officially estimated at from \$3,500,000,000 to \$5,000,000,000. They included the total destruction by fire of the City of Yokohama and the destruction of 70 per cent of

Tokyo. Property in these cities insured to the extent of \$950,000,000 was a total loss to its owners because of the so-called "earthquake clause" in insurance contracts protecting the insurance company against "fire resulting from earthquake." It was estimated that 150,000 persons were killed by the quake and at least half a million houses were burned and a like number wrecked. The chief economic result of the disaster was the necessity for Japan to find immediately large supplies of lumber, iron and steel, hardware and other construction materials abroad. In the four months after September, 1923, import statistics indicated a purchase of nearly \$150,000,000 of these materials. Early in 1924, Japan floated two new foreign loans, one for \$150,000,000 in the United States, with a share subscribed in dollars in Europe and one for £25,000,000 in England. All of the £25,000,000 loan and about \$60,000,000 of the dollar loan were to be set aside to take up two outstanding issues of 4½ per cent municipal bonds of the City of Tokyo coming due early in 1925. The gold holdings abroad of the Government and the Bank of Japan on Jan. 15, 1924, were \$227,500,000, and this, together with about \$90,000,000 of the dollar loan, was to be used to finance purchases of raw materials for reconstruction. A reconstruction programme was adopted by the Japanese Diet in December, 1923, calling for expenditures for widening streets in Tokyo, providing for fire-prevention zones, rebuilding walls, and paving streets. This was to cost \$350,000,000 covering a period of five years, or \$70,000,000 a year.

The earthquake also profoundly affected Japan's foreign policy, both economic and diplomatic. Money for the exploitation of Manchuria would not be available for some years, and the markets in China for Japanese cotton goods and in the United States for raw silk became such important factors in maintaining a volume of reconstruction materials, that the good will of these markets had to be assiduously cultivated. The result was apparent, in the studious forbearance from any action that might tend to affect good will toward Japan in either China or the United States. The fact that 65 per cent of Japan's exports were marketed in China and the United States and that in neither case were the commodities making up most of this amount of such a nature as to prove essential, or incapable of substitution in time of war or boycott, was a tremendous factor leading Japan, dominated by military clans, along the path of peaceful settlements.

## HISTORY

**Domestic Affairs.** Social unrest and the demand for constitutional government and democratic reform grew apace in Japan with the increasing modernization and industrialization of the country. This tendency became strongly manifest in the beginning of 1914, when a widespread opposition to proposed naval increases was intensified by the exposure of extensive corruption among high naval officials. The scandals forced the resignation, on March 24, of the Yamamoto government. On April 16, Count Okuma formed a cabinet with a programme calling for economic reform, the elimination of corruption and true constitutionalism. When the Lower House in December, 1914, rejected the budget increases for the army induced by the

events of the War, it was dissolved by Imperial Decree.

Following the complete victory of the ministerial party in the elections of the next March, the budget was adopted by a large majority. The opposition first attacked the Government's Chinese policy and then charged it with corruption. When the latter charge was partially substantiated, in particular through the disclosure of the bribing of deputies by a cabinet member, Count Okuma resigned (July 30), but on the insistence of the Mikado resumed office with a reconstructed cabinet. However, he was finally forced out in the summer of 1916. As his successor, he designated Viscount Kato, leader of the newly formed Kenseikai, or Constitutional Party, which had a majority in the Diet; but the Genro, or Elder Statesmen, who wielded the real power in the Japanese Empire, brought about, on October 9, the appointment of Marshal Terauchi, Governor General of Korea, who had the reputation of being an arch-militarist. This disregard of constitutional rule highly incensed the Diet, whose sharp opposition brought its dissolution early in 1917. The following elections of April 20 resulted in a victory for Marshal Terauchi and the military party.

The Terauchi government remained in undisputed power until the fall of 1918, when a political explosion occurred which in many ways signified the evolution of a new Japan irreconcilably opposed to the party and the spirit which the ministry represented. Japan had enjoyed an era of great prosperity during the World War. Manufacture of war materials for the fighting nations had greatly expanded Japanese industry, bringing also social and industrial complications and a demand for democratic reform. In the early fall of 1918, a shortage of rice and its high price, causing great suffering among the poor, loosed the accumulated forces in a storm of serious disorders known as the "Rice Riots," which with other manifestations of unrest brought about the fall of the Terauchi cabinet on September 29. The appointment of Takashi Hara was a concession to this new spirit. Hara was the first commoner to become chief of the cabinet and he was, moreover, the leader of the Seiyukai, the party which had for a long time opposed the war policy and the Siberian policy of the Japanese government.

Already in March, 1918, popular demand had brought an extension of the franchise lowering the property qualifications for voters and increasing the electorate from 1,500,000 to 3,000,000. Since this latter figure, however, represented only one-twentieth of the total population, this measure failed to satisfy the people, who early in the following year renewed their loud demands for universal suffrage. In various ways, the Hara government showed itself sympathetic, but when the opposition in 1920 offered bills for universal suffrage, the ministry opposed them as premature, and on that ground dissolved the Diet by Imperial Decree when the bills came up for final consideration on February 26.

In the elections of May, 1920, the government party won 280 seats against 199, 39, and 29 for the three opposition parties, but notwithstanding the victory and the vote of confidence given the Government on the question of national defense in February, 1921, active agitation for universal suffrage continued throughout the country.

On Nov. 24, 1921, the Crown Prince Hirohito was appointed Regent, the Emperor Yoshihito



having been long incapacitated by illness. The Regent was born in April, 1901, had been proclaimed Heir Apparent in 1912 on the accession of his father to the throne, and had been consecrated Crown Prince in 1916. Already, in May, 1920, his father had handed over to him certain functions and had sent him on a mission to Europe.

After holding office for three years, Prime Minister Hara was assassinated on Nov. 4, 1921, at a time when the Washington Conference was about to begin and problems of the utmost importance for Japan were pending. A new ministry was formed by Baron Takahashi, who had been Minister of Finance in the Hara cabinet and who continued in substance the policy of his predecessor. Lack of harmony among the ministers brought about the early fall of the Takahashi cabinet in June, 1922. Thereupon, Admiral Tomosaburo Kato, a member of the Liberal Party and an opponent of the militarists, agreed to head a new government, constituted on a nonpartisan basis, on the condition that the army leaders submit to a reduction of the army budget by 40,000,000 yen. After some minor reductions before that time, the Government took final steps on Nov. 25, 1922, for the retirement of 60,000 men and an annual saving of the before-mentioned sum. At the same time, Japan, having ratified the Washington Treaties on July 6 of the same year, reduced its naval budget on assurance from the United States government that its own naval budget would be framed in accordance with the treaties of the Washington Conference. In pursuance of this policy of retrenchment, further substantial economies in connection with military and naval expenditures were made in the budget for 1923-24. An important forward step in juridical reform was a measure for the introduction of a limited jury system. The bill was laid before the Lower House on Feb. 10, 1923, and passed the Upper House on March 10. Its provisions, however, did not go into effect until Oct. 1, 1928.

On August 28, Admiral Baron Kato died and it devolved upon Foreign Minister Count Uchida to conduct the government as prime minister, ad interim. Count Yamamoto undertook immediately the formation of a new cabinet and he was still engaged upon this task when Tokyo and surroundings were visited, on Sept. 1, 1923, by one of the most disastrous earthquakes in the history of the country.

The earthquake affected an area extending some 80 by 120 miles, and the resulting destruction to life and property was terrific. Yokohama was practically wiped out by the disaster and Tokyo was partially destroyed. The toll in killed and missing amounted to nearly 150,000 lives. The Government which at the time was in process of formation, and which held its first meeting in the open air amid smoking ruins, now faced the vast problem of reconstruction. The people and officials alike put themselves to the task and in a surprisingly short time reconstruction was begun. The whole nation, from the Imperial Family down to the last laborer, rallied heroically to the assistance of the Government and by generous contributions helped in allaying misery and repairing the losses. Relief poured in from all parts of the world, especially from the United States. The Capital Restoration Council and the Restoration Board, established by an Imperial edict, took under consideration immediately plans for the

rebuilding of the destroyed cities on a greater and more modern scale. The supplementary estimates, amounting to 468,438,849 yen, for the preliminary work of reconstruction for the period 1923-29, were passed by the Diet, as was also a bill concerning the organization and procedure for town planning in Tokyo and Yokohama. The plans for rebuilding these cities were drawn up with the assistance of the American expert, Dr. Charles A. Beard, who came to Japan for this special purpose by invitation of Minister Baron Goto. In a statement to the Diet, the Minister of Finance estimated the damage caused by the earthquake at between seven and ten billion yen.

On Dec. 27, 1923, an unsuccessful attempt was made on the life of the Prince Regent as he was on his way to the Diet to deliver a speech from the throne. Since no such attack on the Imperial House had occurred in modern times, the entire ministry felt compelled in consequence to hand in its resignation. The Prince Regent refused to accept it, but the cabinet persisted and its resignation was finally accepted on Dec. 29, 1923. The position of the Yamamoto government had been precarious for some time, due to the opposition of the Seiyukai. A new cabinet, formed by Viscount Kiyoura on a nonpartisan basis, came into office on Jan. 1, 1924. It received little support in the Diet and its early fall would have been certain, had not a split occurred in the Seiyukai and had not the seceding group, which adopted the name of Seiyuhonto, or Original Constitutional Party, and mustered 148 votes in the Lower House, thrown its support to the Kiyoura cabinet. As a result of the attempted wrecking of a railroad train which had three opposition leaders aboard, a storm broke loose in the Diet which led to the dissolution of the Diet on Jan. 31, 1924.

The first loan placed by Japan on the American market since the Russo-Japanese War was offered on February 11. The American share of this loan was to be \$150,000,000 and another section offered to the English public amounted to £25,000,000. Both issues were greatly oversubscribed. The proceeds of the American and English shares of this loan were intended to be used for the retirement of the remainder of sterling 4½ per cent bonds and the balance was to be applied to the financing of reconstruction measures growing out of the earthquake disaster, the total cost of which was placed at approximately \$700,000,000.

Elections for the Lower House were held on May 10 and resulted in the defeat of the Seiyuhonto, the newly-formed party supporting Premier Kiyoura. The returns were reported as follows: Kenseikai, 146; Seiyuhonto, 120; Seiyukai, 101; Kakushin Club, 30; Business Men's Party, 8; Independents, 57. An outstanding feature of the election was the defeat of many members of the preceding Diet and the return of 250 deputies without parliamentary experience. The resignation of the Kiyoura cabinet, necessitated by the adverse vote, was postponed until after the celebration of the wedding of the Prince Regent on June 5. Since no party commanded a majority in the Diet, Viscount Kato formed subsequently a coalition cabinet which represented the Kenseikai, the Seiyukai and the Kakushin Club.

The new American immigration policy and the discrimination against Japanese resulting therefrom aroused a storm of indignation in

Japan. Protest meetings were held, five Japanese patriots committed hara-kiri in protest, and the anti-exclusion organization, called the "Kokumin Taiheikai," was formed. A boycott of American moving-picture films, which had been instituted in retaliation, had to be subsequently abandoned as a failure. On the whole, the American measures had the effect of creating a wave of anti-American feeling in Japan which the Government strove earnestly to keep within bounds so as to prevent any untoward incidents which might further strain Japanese-American relations. Japanese indignation was not so much aroused by the general exclusion policy of the United States as by the special discrimination between Japanese and other aliens and by the placing of members of the proud Japanese nation on the same level with other Asiatics whose governments did not sit at the council table of the great powers of the world. The feeling of friendship and gratitude generated by American generosity on the occasion of the earthquake was seriously impaired by the policy of the United States. While the Immigration Bill was under consideration, the Japanese government took steps to bring about, and actually effected in July, 1924, a change in the laws of citizenship whereby the "dual citizenship" was abolished and Japanese nationals would henceforth lose their Japanese citizenship upon naturalization in another country. It was a measure of the deep hurt inflicted on Japanese national pride that for years the issue continued to be a live one, and as late as 1929 was discussed in the premier's official statement of policy. On July 1, 1925, a day of "national humiliation" was observed, that date being the anniversary of the day on which the American law went into effect. The attitude of people and Government alike remained one of refusing to consider the matter as permanently closed.

In the evolution of Japanese political and social life, it became manifest that the ideals of Western democracy were making continued headway, while at the same time the populace retained its strong sense of loyalty to the Imperial tradition and on the other hand were not greatly swayed by communist doctrine. The outstanding political change of the first post-war decade came in March, 1925, when the long-demanded measure for universal manhood suffrage was adopted. It increased the electorate from about 3,000,000 to 14,000,000, giving the right to vote to every male over 25 years of age who had lived in his locality one year prior to the election, and the right to become a candidate to every male over 30. Property qualifications for voters were practically abolished, and voting was to be by secret ballot.

While this was a striking advance toward a more democratic practice, full parliamentary government was still a matter of future development. The ministry continued to be responsible to the Emperor alone, although in practice cabinets did not continue in office in the face of a vote of no confidence by the Diet. The step in the direction of political liberalism was accompanied by severe restrictions against radical economic agitation.

In March, 1925, a law was passed providing severe penalties for organizing or belonging to a party which attacked private property or the established social and political system centring in the Imperial house. Under this "peace-preservation" law, a new party representing

labor and agriculture was dissolved in the fall of 1925. It was reorganized in the following spring, professing purely constitutional aims, but enlisting only lukewarm support, and two years later it faded away. A new Labor Party with a yet more moderate programme was organized in 1928.

In July, 1925, Viscount Kato reconstructed his cabinet by accepting the resignations of the Seiyukai members over a question of tax reduction. Baron Tanaka succeeded to the leadership of the Seiyukai Party when that position was relinquished by K. Takahashi and attempted without success to unite it with the Seiyuonto Party in a coalition which was intended to displace the controlling Kenseikai Party. In January, 1926, Premier Kato died. R. Wakatsuki, Home Minister, assumed the premiership, retaining the Kato cabinet and policies, and he also became the leader of the Kenseikai Party. The ministry's position in the Diet was somewhat precarious, as it could obtain a majority only with the help of a part of the Seiyuonto Party. In June, the premier sought to strengthen his cabinet by a reorganization, but it remained entirely of Kenseikai complexion.

Perhaps the most prominent piece of legislation enacted under this government was the new land act made effective in November, 1926. It gave to aliens the right to acquire land in Japan, except in certain defensive areas, where the consent of the army and navy heads was required. Aliens of countries which discriminated against Japanese in extending land-ownership rights might be similarly restricted in Japan, but only by Imperial edict. Among the other legislative enactments of this period were an act prohibiting the employment of children under 14 in factories, an act providing for large increases in the duties on wheat and flour, and the grant of increased subsidies for education.

On Dec. 25, 1926, the nation was saddened by the death of the Emperor Yoshihito, after a long illness, at the age of 47. Elaborate funeral ceremonies were held in February, and the rest of the year was observed as a period of mourning.

While the nation rested in the shadow of this event, it was confronted with disaster in the shape of the severest financial depression it had ever known. For a long while, a number of factors had combined to bring ever nearer a widespread liquidation. The reaction from abnormal war activity in industry brought a continuing instability to many lines of manufacture and trade, and this was sharply accentuated by the disastrous earthquake. Early in the year 1927, many commercial failures were reported. The crisis came in March and April, reaching its peak on April 5 in the failure of Suzuki Company, Ltd., with gross liabilities of \$250,000,000. The crash led to the fall of the Wakatsuki government, whose proposal to extend aid to the Bank of Taiwan, heavily involved in the Suzuki crash, was disapproved by the Privy Council. The cabinet resigned on April 17 and on the following day Baron Tanaka, leader of the Seiyukai Party, took over the reins of government, with a cabinet drawn entirely from his own party except for the portfolios of War and Navy.

The new ministry, representing the Conservatives, could number among its assured supporters only a minority of the Lower House, the Kenseikai on March 1 having united with a part of

the Seiyuhonto to form a new Liberal Party, the Minseitō, which controlled some 30 or 40 more votes than the Government. Party lines, however, were not strictly drawn and the cabinet could count on support for its emergency measures in the special session which was called in May. These included an immediate moratorium of three weeks and the providing of funds by which the banks could receive help through the Bank of Japan. A heavy increase in the note issue of the Bank of Japan, made possible by the high gold reserve it had previously maintained, helped supply desperately needed financial aid. Conditions slowly improved, although the strain on the financial structure had been so severe that, one year after the April crash, a large number of the banks affected had not reopened.

The Tanaka government continued in power after the short special session of the Diet in May had adjourned, but a ministerial crisis was expected when it should meet in the following January, as the opposition controlled a clear majority against the cabinet. On January 21, the first day of the session, however, the premier was able to secure a vote dissolving the Diet and making new elections necessary. These were held on February 20. The Government appealed for indorsement of its domestic policy of extending aid to banks and business houses during the panic and its foreign policy of assuming a strong "positive" attitude toward China, and the electorate responded by giving the Seiyūkai Party a small plurality but not a majority. It won 221 seats as against 214 for the Minseitō. The Independents won 16, Labor 8, the Business Men's Party 4, and the Shinsei Club 3.

The election was the first under the new manhood suffrage law, and the interest of the new voters was shown by the fact that four-fifths of the eligible electorate went to the polls. While the Government could command a slender majority on major issues, it could not prevent the opposition from forcing out Mr. Suzuki, the Home Minister, in April. In August, the premier's hand was strengthened by the secession of T. Tokonami and some 30 followers from the Minseitō Party. In November, party politics were momentarily forgotten in the three weeks of festivities beginning November 10, that marked the coronation of the new Emperor, Hirohito.

An item of much concern to the Government in 1928 was the continued activity of communist elements. In February, 84 Koreans were sentenced to prison for communist plotting in the previous summer, and in the spring and summer months many arrests were made because of alleged plots against the Government. In June, the Emperor by ordinance made the maximum sentence under the peace-preservation law the death penalty instead of 10 years imprisonment, and the Diet in its 1929 session readily confirmed the amendment. A special police organization was set up to ferret out offenders. Wholesale arrests of communists following the 1928 elections resulted in the sentencing of 99 persons to prison terms.

On July 2, 1929, Premier Tanaka and his cabinet resigned. The action was precipitated not so much by any single issue or occurrence as by a rising liberal sentiment throughout the country which objected to the "strong" policy toward China. There was also an undercurrent of dissatisfaction over the premier's maladroit

handling of a number of incidents in such a way as to appear too careless about preserving the Imperial dignity. He was succeeded by Yuko Hamaguchi, president of the Minseitō Party and formerly Minister of Finance and Home Minister. The new cabinet brought Baron Shidehara back to the direction of Foreign Affairs. The ministry faced a very uncertain future, as the Shinto Club, a minor party, held the balance of power in the Diet. Late in July, it was reported that it had joined the opposition, and general elections were freely presaged for the near future.

**Foreign Policy.** In 1914, before the outbreak of the War, Japan was confronted with two great international problems, the effects of the unsettled conditions in China on Sino-Japanese relations and the difficulties with the United States arising from the treatment of Japanese citizens on the American Pacific Coast. The outbreak of the War pushed these issues temporarily into the background and supplied the astute statesmen of Japan with a great opportunity for which they had been patiently waiting for a long time. Within a fortnight after the commencement of hostilities between Great Britain and Germany, Japan delivered an ultimatum to the latter demanding the immediate withdrawal of all German warships from Chinese and Japanese waters and the surrender of Kiaochow to Japan, with a view to the eventual return of this territory to China. A week later, Japan declared war on Germany and on Nov. 7, 1914, the German force at Tsingtao capitulated to the Japanese Expeditionary Force. Already, during the previous month, Japan had occupied the Marianne, Caroline, and Marshall Islands in the Pacific. The rapidity of this move came rather as a surprise to the Germans, and even to other nations, in view of the well-known German sympathies in certain influential Japanese circles. As its reason for entering the War, the Japanese government cited its treaty obligations with Great Britain.

A more convincing reason, however, was the Japanese desire to dislodge a Western power from a position that was dangerous to Japanese hegemony in the Far East. Ever since 1895, when the combined action of Russia, Germany, and France compelled Japan to forego part of the spoils of the War with China, guaranteed to her by the Treaty of Shimonoseki, she had been biding her time. In the case of Russia, the opportunity had come with the Russo-Japanese War, and the outbreak of the European conflagration presented now the occasion to hold a reckoning with Germany. Behind the screen of the Anglo-Japanese Alliance, Japan used the preoccupation of the Western Powers in Europe to establish herself in a practically impregnable position in the Far East. No doubt Japan fulfilled faithfully the obligations arising out of the Anglo-Japanese Alliance, helped in removing all vestiges of German power from the Pacific, and even sent a naval squadron to the Mediterranean for convoy duty; but with much more faithfulness did she apply herself to the task of emerging from the War as the Power in the Far East, and of using her position of economic vantage as best she could, with the result that the close of the War found her financially in excellent condition and industrially greatly developed. See **WORLD WAR, DIPLOMACY OF THE.**

Ostensibly, Japan had seized Kiaochow to restore it eventually to China; but when China

demanding the territory, Japan peremptorily presented the well-known Twenty-One Demands, and when China failed to act on them sent an ultimatum which forced the signing, on May 25, 1915, of treaties and agreements embodying fifteen of the twenty-one. In the meantime, Japan constantly increased her military forces on Chinese territory. Such serious encroachments on Chinese sovereignty could hardly be reconciled with Japan's previous declarations of the absence of aggressive intentions and aroused the suspicions even of her own allies. By a number of secret treaties, as well as open agreements, Japan now consolidated her position. In 1916 the last of four secret treaties with Russia following the Treaty of Portsmouth stated that "the vital interests" of the two countries required "the safeguarding of China from the political domination of any third power whatever having hostile designs against Russia and Japan."

In the autumn of 1917, through the Lansing-Ishii Agreement, the United States recognized the special interests of Japan in China arising out of geographical propinquity. Secret agreements with China provided for a common military defense against Soviet Russia (May, 1918) and for far-reaching railroad concessions to Japan in China. These agreements, which were not disclosed officially to the other Allied Powers until after the opening of the Peace Conference, caused great resentment in China when they became public and also proved injurious to the Chinese claims at the Peace Conference. Of far greater significance, however, were the secret agreements concluded between Japan and the Allies early in 1917, whereby the British, French, Russian, and Italian governments, which were at the time greatly in need of Japanese naval assistance, pledged themselves more or less unconditionally to support at the Peace Conference the Japanese claims with regard to the disposal of the former German rights in Shantung and the Pacific Islands north of the equator.

The military collapse of Russia and the Russian Revolution not only delivered Japan from her greatest rival in the Far East, but also gave her an opportunity to pursue a policy of her own with regard to Siberia. Already early in 1918, Japan had landed troops in Vladivostok for the protection of Japanese nationals and interests. In the subsequent Allied intervention in Siberia during the fall of 1918, Japan was an active participant, but at no time did she manifest any genuine concern for the establishment of a strong and stable anti-Bolshevik government. In fact, she refused to extend her intervention to the region east of Lake Baikal where she had no special interest. At the same time, there was strong evidence of Japanese unacknowledged dealings with such semi-independent Cossack leaders and notorious brigands as Semenov and Kalmikov who were far more of a liability than an asset to the White Russian movement and served to further materially the designs of Japan in Siberia. Thus Japan, by her policy of obstruction, seems to have contributed materially to the final collapse of the anti-Bolshevik government and to the failure of Allied intervention in Siberia. See *SIBERIA*.

At the Peace Conference, Japan was represented by a strong delegation headed by Marquis Saionji. The Japanese representatives took part in all the important sessions on a footing of equality with those of Great Britain, France,

Italy, and the United States; and Japan was one of the powers which formed the all-powerful Council of Ten. The Japanese delegates presented two separate claims. Of these, the demand for the recognition of racial equality met with strong opposition, primarily on the part of the United States, and hence was eventually rejected (see *PEACE CONFERENCE*). Japan was more successful in her claims with regard to Shantung and the former German islands in the Pacific north of the equator. The arguments advanced by the head of the Japanese delegation in favor of retention of these territories were in substance as follows: Japan had taken these places from Germany during the War in fulfillment of her treaty obligations; she held them in occupation at the time; they should form Japan's just compensation for her contribution to the Allied victory. After much delay and discussion, the former German rights in Shantung were finally awarded to Japan on Apr. 30, 1919. The withdrawal of Italy from the Conference had given Japan an opportunity to threaten with a refusal to sign the Peace Treaty unless her claims with regard to Shantung were favorably considered. It was then that Messrs. Clemenceau and Lloyd George voted in accordance with the pledges given to Japan in the secret agreements of February and March, 1917, and thus overrode the opposition of President Wilson, who declared he was ignorant of these understandings. See *PEACE CONFERENCE*. On May 7, 1919, the Council awarded to Japan the islands in the Pacific north of the equator to be administered under the mandatory system.

The Japanese sovereignty over the Island of Yap, contained within this group, was disputed by the United States, which based its objection on the ground that it had never ratified the Peace Treaty of Versailles. A final adjustment of the matter took place at the Washington Conference at the end of 1921, in the form of an agreement whereby the United States recognized Japanese sovereignty over Yap and was accorded in return full rights and facilities in connection with the cables and other matters. See *YAP* and also *WASHINGTON CONFERENCE*.

The allocation of German rights in Shantung to Japan caused a storm of protest in China and general indignation throughout the world, coupled with apprehension at the manner in which astute Japanese statesmanship had grasped more or less firmly a vast territory in the Far East comprising Eastern Siberia, Sakhalin, Kamchatka, Manchuria, Inner Mongolia, and Shantung. Post-war history marks Japan's gradual retreat from these territories partly as the result of international public opinion and partly because of a reorientation of Japanese foreign policy. On May 7, 1920, Japan announced her readiness to withdraw her reservations in Mongolia and Manchuria, bringing these territories under the authority of the Chinese Loan Consortium consisting of American, British, French, and Japanese banking groups.

Far greater difficulties were encountered in the settlement of the Shantung problem. Repeated attempts of Japan to negotiate with Peking were blocked by China's steadfast insistence that the territory and the rights connected with it must be returned to her before the subject could be discussed. A treaty was finally signed at the Washington Conference on Feb. 7, 1922, by which the former German port and concessions were to be immediately returned

to China in return for the payment of a monetary compensation and the grant of certain rights to Japan. See SHANTUNG; also WASHINGTON CONFERENCE. At the same time, Japan signed the Treaty of the Open Door in China by which she gave up other reservations there, but refused to abandon her hold on Manchuria and Mongolia (see WASHINGTON CONFERENCE). She also bluntly refused a Chinese request of May 10, 1923, to negotiate for a modification or abrogation of the Treaties and Agreements of May 25, 1915.

In spite of various declarations and promises, Japan did not participate in the withdrawal of the Allied Expeditionary Force in Siberia after the Kolchak debacle early in 1920, but consolidated her position east of Lake Baikal. Representations by the United States and, more particularly, the progress of Soviet power in Siberia caused the Japanese in the following years slowly to retrace their steps and withdraw to the Maritime Province and Vladivostok, and then to prepare for total evacuation. However, they occupied northern Sakhalin in retaliation for the Nicolaievsk massacre early in 1920. Following the failure of a lengthy conference between the Japanese and representatives of the Far Eastern Republic in Dairen, Japan announced her intention of withdrawing her troops from the mainland of Siberia by the end of October, 1922.

Another conference at Changchun, in Manchuria, with representatives of the Far Eastern Republic and Moscow in September, 1922, broke up because of Japan's refusal to evacuate northern Sakhalin and recognize the Soviet government. However, when the latter soon thereafter took over control of the whole mainland of Siberia and adopted a definite policy with respect to Mongolia, China, and the Far East in general, signs began to appear that Tokyo and Moscow were seeking a *modus vivendi*. Thus, the year 1923 was taken up with private and semi-official conferences between Russian and Japanese high officials looking toward the conclusion of a Russo-Japanese commercial treaty, the recognition of the Soviet government by Japan, and the evacuation of northern Sakhalin, the last-named issue being the chief stumbling block.

On July 24, 1924, the Japanese cabinet adopted a plan submitted by Foreign Minister Shidehara embodying, in addition to these three provisions, the granting of concessions to Japan for exploiting oil and minerals in northern Sakhalin, apology for the Nicolaievsk massacre, and recognition by Russia of the Portsmouth Treaty. Negotiations continued during the rest of 1924. On Jan. 20, 1925, a convention was finally signed which with attached protocols contained all the above provisions. It was put into effect on February 26 and Japan completed her evacuation of northern Sakhalin by May 15. In July, 1925, a Japanese delegation visited Moscow to arrange for the concessions granted by the treaty in Sakhalin and on Dec. 14 contracts were signed for Japanese exploitation of oil and coal fields there. In April, 1927, a further concession was given to a Japanese syndicate to exploit more than 2,700,000 acres of timber land on Tartar Strait. Following these agreements, relations between Japan and Russia were marked, in some aspects, by an almost cordial friendship. In certain other respects, however, sharp differences appeared, notably in connection

with proposed railway development in Manchuria and with Soviet propaganda in China, which Japan vigorously opposed.

Japan was one of the chief participants in the Washington Conference, Nov. 12, 1921-Feb. 6, 1922, in which agreements of outstanding importance to Japan were arrived at. The treaties and agreements affecting Japan, aside from those specifically relating to China—such as the Shantung agreement, the Nine Power Treaty of the Open Door in China, the treaty pertaining to the Chinese tariff, the agreement relative to the withdrawal of foreign control of post offices in China—were the Four Power Treaty, dealing with the problems of the Pacific; the Five Power Naval Treaty, and the agreement between the United States and Japan relating to the status of the island of Yap. The Four Power Treaty aimed at the settlement of problems arising out of Japan's need for expansion in the Pacific by an agreement between the contracting powers for the mutual protection of island possessions and dominions in the Pacific. The Five Power Treaty provided for naval limitation on the basis of the 5-5-3 naval ratio, Japan limiting herself thereby to the maximum of 10 capital ships of 312,700 tons, as against 20 of 582,540 tons for Great Britain and 18 of 525,850 tons for the United States. On the part of Japan, these treaties represent a sincere effort at an amicable understanding with the view of preventing questions arising out of Japan's astonishing growth as a power within the last 10 years from developing into armed conflict. A further manifestation of this spirit was the faithful carrying out of the Washington agreements and the adoption by the Japanese government of a policy of military and naval retrenchment.

A direct result of the Washington Conference was the cancellation of the Lansing-Ishii Agreement in March, 1922, because in view of the Nine Power Treaty, a new understanding had become possible. By the Four Power Treaty, the Anglo-Japanese Alliance was definitely superseded. Subsequently, there occurred in Great Britain much criticism of Japan and apprehension at the growing power of that country in the Far East. Concentration of British naval units in the Pacific and the drafting of a plan for a naval base at Singapore caused increased watchfulness on the part of Japan.

Perhaps the most serious factor in Japanese foreign relations was the status of Japanese in the United States and especially their treatment in the Pacific States. Difficulties arising therefrom had been to some extent regulated by the "gentlemen's agreement" concluded between Japan and the United States. After a comparative lull in the situation due to the exigencies of the War, new friction arose in 1920 with the passage by California on November 2 of an act by which "ineligible aliens" forfeited all rights of holding land in that State. This was followed by anti-alien land legislation in other Western States. With the Washington Conference, the generous extension of aid to Japan by the United States on the occasion of the great earthquake, in 1923, and the manifestation of sincere gratitude on the part of the Japanese government and people, an era of better understanding between the two countries seemed to be approaching. But whatever ground for hope in that direction might have existed was hopelessly blighted by decisions of the United States



Supreme Court on Nov. 12 and 19, 1923, sustaining in full the alien land laws of California and Washington.

Much more serious, however, was the effect of the new American immigration law, effective July 1, 1924, which carried a Japanese exclusion clause and amounted to an abrogation of the "gentlemen's agreement." This measure caused a storm of indignation in Japan. The Japanese government, however, proceeded with caution and did everything in its power to avoid cause for conflict. It prevented too extreme expression of public indignation and took steps to abolish "dual nationality." On April 10, Masanao Hamihara, Japanese Ambassador in Washington, wrote a letter to Mr. Hughes in which he referred to the "grave consequences which the enactment of the measure" would inevitably bring upon the otherwise happy and mutually advantageous relations between the two countries. This statement provoked hostile criticism in the United States. On May 31, the Japanese Ambassador presented a lengthy note of protest of his Government to the American government. Secretary Hughes's reply was well received in Japan but failed to satisfy public opinion. The departure of the Japanese Ambassador to Japan on June 11 was interpreted in many circles as a direct result of the Immigration Bill. Whatever right the United States might have possessed to pursue such a policy and whatever merits the bill had from the standpoint of American domestic policy, there can be no doubt that the new policy seriously impaired the beneficial results of the Disarmament Conference, in spite of the fact that the Japanese government preserved a very calm front. It was significant that the Japanese Minister of the Navy declared on July 7 in the Diet that a decided expansion of the Japanese naval air forces, "necessitated by recent developments at home and abroad," was contemplated. While public feeling continued highly sensitive on the subject for many years and officials felt it necessary to continually reaffirm their position that it remained an open question, no further diplomatic moves had been made up to the summer of 1929.

Influenced by the pressure of world opinion and by the general drift toward democratic ideals following the War, Japan adopted an attitude toward China much more liberal than that initiated by the Twenty-One Demands. For the most part, this attitude was maintained during the chaotic years throughout which China was struggling for national unity. In 1924 Foreign Minister Shidehara declared the policy of Japan to be noninterference in the domestic affairs of China with concern only for the maintenance of Japanese rights in that country and the extension of Japan's aid if desired. He professed close adherence to the spirit of the Washington treaties.

In the following year, he reiterated these sentiments in his address before the Diet in January. In May, however, a long period of anti-foreign disturbances in China began with disorders at Shanghai occasioned by the killing of a Chinese workman in a Japanese cotton mill, and Japan was obliged to make many moves with armed forces to protect her nationals. During the Shanghai strike Japan declared a policy of "watchful waiting," and sent destroyers to the city, later landing marines along with other foreign powers. The boycott against Japanese

goods following the Shanghai incident did great damage to Japanese merchants and manufacturers, but did not materially alter the Government's attitude, which the opposition criticized strongly as too mild.

In October, 1925, Japan took part in an international conference for the purpose of readjusting Chinese customs tariffs prescribed by the various treaties with foreign countries. The conference readily agreed to grant China full tariff autonomy, beginning in 1929, but in the controversy over ad-interim rates, Japan stood out firmly against high surtaxes which would affect her trade more than that of any other country. While the conference sessions continued, attention was diverted from them to Manchuria, where civil war broke out between Chang Tso-lin and Kuo Sung-ling. Japan immediately increased her forces in Manchuria and occupied Mukden in December. Replying to protests from many quarters over her apparent military intervention in Manchuria Japan denied any purpose of violating the Washington treaties. At the close of the year, Chang Tso-lin achieved an unexpected victory and it was charged that Japanese aid had made it possible.

Early in 1926 the additional troops sent to Manchuria were withdrawn and Mukden was evacuated. During the warfare between North and South in China, Japan attempted at first chiefly to safeguard her commercial interests and the lives and property of Japanese residents in China, making a show of force only when obviously necessary. One such occasion arose when the Taku Fort was captured in March, 1926, by the warring Chinese factions. Japanese destroyers were fired upon and a number of casualties resulted. Japan sent a cruiser to Taku and demanded apologies, and with the other Powers forced the evacuation of the fort and the freeing of the river it commanded.

On Jan. 17, 1927, Foreign Minister Shidehara, in his address to the Diet, declared that Japan's whole policy toward China might be summarized by saying that Japan would "respect the sovereignty and territorial integrity of China and scrupulously avoid all interference in her domestic strife; promote the solidarity and economic rapprochement between the two nations; entertain sympathetically and helpfully the just aspirations of the Chinese people and cooperate in efforts of realization of such aspirations; and maintain an attitude of patience and toleration in the present situation in China and at the same time protect Japan's legitimate and essential rights and interests by all reasonable means at the disposal of the Government."

This conciliatory policy was the object of vigorous attack from the opposition. When the financial crisis brought Baron Tanaka to the helm in April, 1927, a more assertive policy was assured, as he was known to be a Conservative with strong militarist tendencies. He immediately took steps to strengthen Japan's hand in China. Military forces were sent to Tsiungtao and Tsinanfu with the avowed object of protecting Japanese interests there, but in September, they were withdrawn from the latter city. Japan demanded the restoration of the Japanese consulate at Nanking, which had been looted and occupied in March without reprisals from Japan. In June, a Japanese consulate was re-established there.

In Manchuria, the Japanese government initiated a "forward" policy, emphasizing Japanese

interests and the right to protect them as against other foreign interests. Reprisals were threatened for the continued anti-Japanese boycott, which was seriously injuring Japanese trade. Troops were sent from Tsingtao to Tsinanfu and from Manchuria to Tsingtao, supplies were landed at the latter port, and military railway and telegraph men were sent there from Tokyo. On demand of the Peking government, however, the troops were removed from the two cities. In Manchuria, an ambitious plan for extending the South Manchuria Railway was projected and negotiations begun for a large loan by J. P. Morgan & Co. to a Japanese syndicate for that purpose. Violent opposition arose among the Chinese. The Nanking government charged that the loan was in direct furtherance of Japanese imperialism and protested by cable to Secretary Kellogg. The plan was finally abandoned.

In 1928 the final victorious campaign of the Nationalists in China brought a number of clashes with Japanese forces. When Chiang Kai-shek advanced into Shantung in the spring of 1928, Japan, proclaiming the need for protecting her interests in the province, once more sent troops to Tsinanfu and Tsingtao. On May 1, Chiang's army captured Tsinanfu, and two days later fighting began between his forces and the Japanese stationed there. It continued intermittently for a week, resulting in several hundred casualties. The Nationalists were finally driven out on May 11. Four days later, the Japanese government forbade all military activity within seven miles of the Shantung Railway, and demanded an apology from Chiang Kai-shek and the punishment of subordinate officers. Fearing a general uprising against Japanese throughout China as a result of the fighting in Shantung, Japan rushed a full war-strength division of troops to the province and sent two cruisers and 27 destroyers to the Yangtze to protect Japanese nationals.

The occupation of Shantung did indeed provoke wide protest among the Chinese but no anti-Japanese action more violent than a number of incipient boycotts occurred. The fighting, however, had a pronounced and possibly a decisive effect in crystallizing Chinese opinion in favor of the Nationalist cause.

With the occupation of Peking early in June the civil war practically ended, and Japan was presently able to recall part of both the land and naval forces in China. Meanwhile, Japan had also taken a firm stand in Manchuria, warning both the Peking and the Nanking governments on May 18 that no extension of the civil war into Manchuria would be tolerated. Early in June, Chang Tso-lin, ruler of Manchuria, was killed on his retirement from Peking when his train was bombed as it approached Mukden. Japanese troops guarded the section of the railway where the bombing occurred and circumstances pointed strongly to official Japanese connection with the affair; but if Japan intended to remove Chang Tso-lin as a preliminary to establishing a protectorate over Manchuria, the aroused hostility of public opinion prevented. From the date of the Nationalist occupation of Peking, in fact, Japan saw whatever dreams she may have had of hegemony in China fade rapidly. She abandoned them reluctantly. In Manchuria, Japanese influence for many months held back the new ruler, young Chang Hsueh-liang, from openly joining fortunes with the new republican government; but on Dec. 29, 1928, the Nation-

alist flag was raised over the government buildings in Manchuria, which thus became an integral part of the Chinese Republic.

When the Nanking government demanded the abrogation of the "unequal" treaties with various countries, all acquiesced except Japan. Japan's refusal to agree to full tariff autonomy for China was continued up until the day before the new tariff rates went into effect, Feb. 1, 1929. Although Japanese forces in Shantung were progressively reduced following the ending of the civil war, it was not until May 20, 1929, that the last transport sailed. This evacuation was in accordance with an agreement reached on March 28 on the issue of the Tsinanfu incident of the preceding May, the settlement also providing for a commission to pass on claims for damage by both sides.

On May 30 Japan formally recognized the new Government of China. The end of the forceful militaristic policy of Japan toward China, for the time being at least, came with the fall of the Tanaka government on July 2, 1929, and the accession of the Minseito or Liberal Party to power. The new cabinet included Baron Shidehara as Foreign Minister and it was expected that his policy of conciliation and friendship toward China would again prevail.

While Japan readily accepted in principle the Kellogg Treaty for the outlawry of war, a considerable delay in ratifying it occurred because of the phrase, "in the names of their respective peoples" as applying to signatories. This was held to reflect on the Imperial prerogative for concluding all treaties. The Emperor, however, finally ratified the treaty on June 27, with an accompanying statement that the phrase in question did not apply to Japan. In the abortive three-power naval conference at Geneva in 1928, Japan's attitude was favorable to naval reduction, and in 1929 the Government continued to maintain consistently an attitude strongly favoring disarmament.

**JAPANESE BEETLE.** See ENTOMOLOGY, ECONOMIC.

**JARDINE, WILLIAM M.** (1879- ). An American agronomist and public official, born in Oneida County, Idaho. He was graduated from the Agricultural College of Utah in 1904 and took postgraduate studies at the University of Illinois. In 1904 he was appointed assistant in agronomy at the Agricultural College of Utah, and became professor in 1905-06. He was agronomist at the Kansas State Agricultural College and Experiment Station in 1910, and in 1913 was acting director of the Experiment Station and dean of agriculture at the Kansas State Agricultural College. Professor Jardine was director and dean of agriculture at that institution from 1913 to 1918, and from 1918 to 1925 was its president. He was Secretary of Agriculture in the cabinet of President Coolidge, 1925-29.

**JASPAR, HENRI** (1870- ). A Belgian lawyer and Prime Minister, born in Schaerbeck. In 1919 he was elected to the Chamber as an anti-Flemish Catholic member for Liège, and from 1920 to 1924, he was Foreign Minister, following a policy of close coöperation with France, which included the joint occupation of the Ruhr by that country and Belgium in 1923. On May 22, 1926, when one government after another fell because of the distressing financial situation, he formed a Ministry of Public Safety consisting of four Catholics, four Socialists, and one Liberal, thus reducing the number of ministers from

fourteen to nine. In the middle of 1927, the Socialists resigned because of the military service bill and M. Jasper formed a new government in November. See BELGIUM, under *History*.

**JASTROW**, yās'trō. IGNAZ (1866- ). A professor of the science of government at the University of Berlin (see VOL. XII). His works after the World War deal mainly with economic problems. They include: *Kriegszustand* (1914); *Mitteluropäische Zollannäherung und Meistbegünstigung* (1915); *Geld und Kredit im Kriege* (1915); *Die Handelspolitische Zukunft Deutschlands* (1917); *Völkerreichtum und Wirtschaftskrise* (1917); *Volkvermögen im Kriege* (1920); *Reform der staatswissenschaftlichen Studien* (1924).

**JASTROW**, JOSEPH (1863- ). An American psychologist (see VOL. XII). He retired from his professorship at the University of Wisconsin in 1927. His later work comprises analytic studies of the sentiments and higher mental complexes. His published works include *Character and Temperament* (1915) and *The Psychology of Conviction* (1918).

**JASTROW**, MORRIS, JR. (1861-1921). An American philologist and Orientalist (see VOL. XII). His last published works were *The Civil Law of Babylonia and Assyria* (1915); *The War and the Bagdad Railroad* (1917); *The War and the Coming Peace* (1918); *A Gentle Cynic*, an abbreviated translation of the Book of Koheleth or Ecclesiastes (1919); and *The Eastern Question and its Solution* (1920).

**JAVA**. See DUTCH EAST INDIES.

**JAY**, PETER AUGUSTUS (1877- ). An American diplomat, born in Newport, R. I. He was graduated from Harvard College in 1900 and in 1902 entered the diplomatic service as third secretary of the American Embassy in Paris. He served as secretary at several embassies, including Constantinople and Tokyo. From 1909 to 1913, he was diplomatic agent and consul general at Cairo. He served as secretary of the American Embassy in Italy in 1913, and at the same time was counselor at that embassy. He was Minister at Salvador in 1920; Minister to Rumania, 1921-25; and Ambassador to Argentina, 1925-27. In the latter year, he resigned from the diplomatic service.

**JAZZ**. Immediately after the close of the World War, a new kind of popular music made its appearance in the United States and at once attained enormous vogue, taking complete possession of the dance halls, the theatres, the moving-picture houses, and the hotels. Jazz is a natural development of the older rag-time, which finally became transformed through the amalgamation of various elements. During the War, the soldiers amused themselves by doing "stunts" on their musical instruments. Some one discovered that very funny effects could be produced by laughing, catcalling, wailing, or uttering short exclamations through brass instruments. After their return to civilian life, these ex-soldiers introduced these stunts into the dance orchestras. The circus bands contributed their weird imitations of Oriental music. Real Oriental effects were contributed by musicians who had played in orchestras in San Francisco and other Western cities. The influence of the Negro melodies of the South also is very noticeable. Even Futurism is responsible for some queer harmonic combinations. Some attempts have been made to trace the origin of jazz to African tunes. Comparison, however, at once establishes the

fact that the aboriginal African melodies are characterized by the absence of any regular periodic structure and the presence of several cross-rhythms, whereas jazz clings to regular four- or eight-bar periods supported upon one predominating rhythm.

The first jazz compositions, which appeared in 1919, were crude enough; in fact, little more than degenerate rag-time. This is not surprising, when one considers that these pioneers were men who elaborated their tunes by ear on the piano and required the aid of some musician to fix them in musical notation. As these tunes quickly superseded, and even drove out, the older dances, the dance orchestras naturally became the principal factor in the development of jazz. To remedy to some extent the crudities of the printed score, embellishments of various kinds were introduced *ad libitum* (vulgarly called "libbin'") during actual performance. The conductors soon began to realize the necessity of reducing to a system this free improvisation by a number of players, if the performance was not to degenerate into chaotic noise. Thus, there sprang up a group of regular arrangers, skilled musicians, able to recognize the possibilities of certain jazz tunes and capable of altering, harmonizing, and embellishing, so as to render them acceptable to the popular ear.

From this point on, it was the arranger, rather than the composer, who became the important factor in the development of jazz. Effective orchestral coloring became a prime consideration, and this brought about a radical revolution in the constitution of the former monotonous dance orchestra, so that the jazz band is capable of a considerable variety of tonal effects. The average combination of instruments for a small band is a piano, two or three saxophones (the typical jazz instrument), a violin, two trumpets, a trombone, a tuba, a banjo, and drums. Finally, large symphonic jazz orchestras were formed which consisted of the almost complete classical symphony orchestra with the addition of the indispensable saxophones. Briefly, jazz may be described as light music with melodious themes elaborately embellished and adapted to some popular dance rhythm. A very common practice is to give the principal theme to the violin, against which the saxophone executes a counter-theme. Several arrangers have not hesitated to jazz themes of famous composers (Beethoven, Wagner, Schubert, Saint-Saëns, etc.), a practice that has called forth violent protests from lovers of serious music.

A special form of jazz, which had its origin in Memphis, is the "Blues," so-called from the fact that the music illustrates a text describing some melancholy tale of disappointed love. On the musical side, this form derives directly from the Negro spirituals, and its special characteristic is a triplet appoggiatura before the bass note of the principal accent in each measure. In recent years, otherwise serious American composers have introduced occasional jazz rhythms into their works and George Gershwin even wrote a Jazz Concerto in F for piano and orchestra, which he played with the New York Symphony Orchestra under Walter Damrosch (1925). Of the innumerable jazz bands throughout the country, that of Paul Whiteman won a national reputation on two transcontinental tours. A European tour in 1925 was responsible for creating a veritable craze for jazz in

Germany, so much so, that several modernistic German composers were tempted to try their hand at the new idiom. One of the extremists, Ernest Křenek, wrote a jazz opera, *Johnny spielt auf*, which, after its première in Leipzig (1927), successfully made the rounds of a number of German stages, found its way to Paris (1928), and was produced even at the Metropolitan Opera House (Jan. 19, 1929).

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**JEANS, SIR JAMES HOPWOOD** (1877- ). A British astronomer and mathematician, educated at Trinity College, Cambridge. He was university lecturer in mathematics at Cambridge (1904), professor of applied mathematics at Princeton University (1905-09), Stokes lecturer in applied mathematics at Cambridge University (1910-12), Halesy lecturer at Oxford University (1922), and research associate at Mt. Wilson Observatory (1923). For his astronomical work, he was awarded the royal medal of the Royal Society (1919) and the gold medal of the Royal Astronomical Society (1922). His publications include *The Dynamical Theory of Gases* (1904); *Theoretical Mechanics* (1906); *The Mathematical Theory of Electricity and Magnetism* (1908); *Radiation and the Quantum Theory* (1914); *Problems of Cosmogony and Stellar Dynamics* (1919); *Atomicity and Quanta* (1926); *Astronomy and Cosmogony* (1928) and *Eos, or the Wider Cosmogony* (1929). He was knighted in 1928. See ASTRONOMY; PHYSICS.

**JEBEL SHAMMAR.** See ARABIA.

**JELlicoe, jèl'ik-ò, THE RT. HON. JOHN RUSHWORTH, FIRST EARL AND VISCOUNT BROCAS OF SOUTHAMPTON** (1859- ). An English naval officer (see VOL. XII). Shortly after the outbreak of the World War, he was placed in command of the Grand Fleet, and in 1915 was created a full admiral. He was in supreme command of the British Fleet at the Battle of Jutland (May 31, 1916), and in November of that year became First Sea Lord, Admiral Beatty succeeding him as Commander of the Fleet. Lord Jellicoe established the anti-submarine division of the Navy Staff, became Chief of Staff (1917), and Admiral of the Fleet (1919). He was Governor General and Commander-in-Chief of the Dominion of New Zealand from 1920 to 1924, when he retired. Among the many honors he received were the Order of Merit (1916), and the Freedom of the City of London, with a sword of honor (1920). He was made Viscount Jellicoe of Scapa (1918) and Earl in 1925. He wrote *The Grand Fleet, 1914-16; its Creation, Development, and Work* (1920), and *The Crisis of the Naval War* (1920).

**JELLIFFE, SMITH ELY** (1866- ). An American neurologist (see VOL. XII). In addition to editorial supervision of the *New York Medical Journal*, *Journal of Nervous and Mental Diseases*, and *Psychoanalytic Review*, and of translations and new editions of books on psychiatry, etc., Dr. Jelliffe collaborated with Dr. W. A. White in the preparation of a textbook, *Diseases of the Nervous System* (1915).

**JELLINEK, yèl'li-nèk, KARL W. K.** (1882- ). An Austrian professor of analytical chemistry at Danzig Technical High School. He wrote textbooks on analytical chemistry; *Welt-engeheimnis*, a work on the harmonious union

of philosophy, art, and religion (1920); and *Welttätter und Relativtheorie* (1922).

**JENKINS, BURRIS ATKINS** (1869- ). An American clergyman, born in Kansas City, Mo. He was graduated from Bethany College in 1891 and took postgraduate courses at Harvard. Ordained to the Christian (Disciples) ministry, he was pastor in Indianapolis from 1896 to 1900. He was president of Kentucky University from 1901 to 1907, and from the latter date was pastor in Kansas City. He was editor and publisher of the *Kansas City Post*, 1919-21. He wrote *The Man in the Street and Religion* (1917); *It Happened Over There* (1918); *The Brace-Girdle* (1922); *The Beauty of the New Testament* (1925).

**JENKS, ALBERT ERNEST** (1869- ). An American anthropologist. He was born in Ionia, Mich., and studied at Kalamazoo College, the University of Chicago, and the University of Wisconsin. He has been chairman of the department of anthropology at the University of Minnesota since 1918. He has contributed to anthropological and ethnological magazines and has published, among other works, *Indian-White Amalgamation: an Anthropometric Study* (1916), and *Chart of Prehistoric Man and Culture* (1927).

**JENKS, JEREMIAH WHIPPLE** (1856- ). An American economist and educator (see VOL. XII). He founded and was director of the Far Eastern Bureau from 1913 to 1921. In 1917 he became research professor of government and public administration and director of the division of Oriental commerce and politics of New York University. Since 1918 he has been a member of the High Commission of Nicaragua, also director of the Pacific Railways of Nicaragua and the National Bank of Nicaragua. His later books include *Business and Government* (1917); *Jesus' Principles of Living*, with C. F. Kent (1920); *Great American Issues*, with John Hays Hammond (1921); *Science of Business* (1927). He was a frequent contributor to periodicals on literary, economic, and political questions.

**JEPSON, WILLIS LINN** (1867- ). An American botanist. He was graduated from the University of California in 1889 and took postgraduate studies at Cornell and Harvard universities, and in England and Germany. He was appointed assistant in botany at the University of California in 1891, and was successively assistant professor, associate professor, and after 1919 professor. He explored the remote mountains and desert regions of California and conducted botanic expeditions in Alaska and the Bering Sea. He was a member of many scientific societies and the author of: *Flora of Western Middle California* (1901); *The Trees of California* (1909); *The Silva of California* (1910); *A Flora of the Economic Plants of California* (1924); *An Illustrated Manual of the Flowering Plants of California* (1925).

**JERITZA, MARIA** (1893- ). An Austrian dramatic soprano, born at Brünn. She attended the Musikschule there and studied singing privately with Professor Krejci, then continued her lessons with Professor Auspitzer for three years. After her début as Elsa in *Lohengrin* at Olmütz, in 1910, she sang there for five months, when she was engaged for the Volksoper in Vienna, where she rapidly rose to prominence, so that Strauss chose her to create Ariadne in the world première of his *Ariadne auf Naxos* at Stuttgart (1912). In the same

year, while still in her teens, she was engaged for leading rôles at the Vienna Hofoper, at first as guest, but from 1913 as regular member, after the Hofoper had paid the forfeit for her unexpired contract with the Volksoper. In 1917, she was made Kammersängerin, being the last artist on whom that title was bestowed. She created the principal rôles in most of the novelties produced at the Hofoper, which in 1919 became the Staatsoper. On Nov. 19, 1921, she made her American début, with sensational success, at the Metropolitan Opera House as Marietta in the American première of Korngold's *Die tote Stadt*, establishing herself immediately as a prime favorite. In addition to continuing with the Metropolitan Opera Company, she enjoyed a notable reception in Vienna in 1929. While her voice is one of rare beauty and power, she fascinates her audience primarily through her unusual talent as an actress. Her repertory comprises more than 50 rôles. Consult W. von Wymetal, *Maria Jeritzu* (Vienna, 1922) and her autobiography, *Sunlight and Song: A Singer's Life* (New York, 1924).

**JEROME**, jér'm, JEROME K (LAPKA) (1859-1927). An English humorist and novelist (see Vol. XII). His health was broken by having driven an ambulance on the Verdun front during the early part of the World War. His later works include *The Great Gamble* (1914); *Malvina of Brittany* (1917); *Cook* (1917); *All Roads Lead to Calvary* (1919); *Anthony John* (1923); *A Miscellany of Sense and Nonsense*, a selection from his writings (1924); *The Soul of Nicholas Snijders*, a mystery play (1925); *The Celebrity*, a play (1926), and *My Life and Times, an Autobiography* (1926).

**JERSEY CITY**. The second city of New Jersey in population and the chief seaport of the State. The population increased from 267,779 in 1910 to 298,103 in 1920 and to 324,700 in 1928, by estimate of the Bureau of the Census. The port, which forms part of New York Harbor, has 11 miles of waterfront. During the World War, it was a shipping point of great importance, and its need of larger dock capacity was greatly emphasized in this period. Since 1922 various dock and harbor improvements have been carried out, and about 26,000 lineal feet on the western waterfront of the city has been made available for steamship docking facilities. Jersey City is a terminal for 9 trunk railroads and 50 steamship lines. Among the municipal improvements which have been carried out since 1920 are the opening of Pershing Field, a great park and recreation centre embracing a large area of what was previously waste land; the development of Journal Square by the enlargement of the Pennsylvania Railroad station at a cost of \$1,000,000 and the construction of several bank and office buildings, including the new Labor Bank and Trust Company of New Jersey buildings; and the repaving of a large mileage of streets and laying of sewers, so that in 1929 Jersey City had 204 miles of streets within the city's limits and 145 miles of sewers. During this period the health department also was active. The City Hospital was enlarged and made a Community Health Centre from which the various health activities of the city were directed. In 1929 a 17-story extension was added to the hospital and an 11-story extension, to the Nurses' Home.

The same year the Lackawanna Railroad erected a new dry-storage warehouse costing \$13,000,000. Jersey City is one of the most im-

portant manufacturing cities on the Atlantic Coast, the principal industries being metals, oils, foods, and chemicals. In 1925, 30,607 persons were employed in approximately 1300 manufacturing establishments and received \$42,496,000 in wages; the value of products manufactured was \$340,735,000. On May 2, 1929, the Claremont Bank and the Trust Company of New Jersey were consolidated, bringing about the formation of the second largest banking institution in the State. The total combined resources of Jersey City's banks, as of Dec. 31, 1928, was \$371,004,961 and deposits were \$303,417,062. In 1928, 1457 new buildings were erected at a cost of \$15,400,000. The assessed valuation of property in 1927 was \$614,399,000; the net debt was \$66,547,000. The Jersey City municipal airport is located at Droyer's Point and constitutes one square mile of reclaimed meadow land. On Nov. 13, 1927, the Holland Vehicular Tunnel between New York and Jersey City was put into operation and functioned successfully. This tunnel was erected at a cost of \$48,400,000 half of the expense of construction and maintenance being borne by each State. It consists of two tubes, the north tube accommodating west-bound traffic and the south tube, east-bound traffic. See TUNNELS.

**JESPERSEN**, yës'për-sën, (JENS) OTTO (HARRY) (1860- ). A Danish philologist (see Vol. XII), rector of the University of Copenhagen (1920-21) and president of the Modern Humanities Research Society (1921). In 1925 he retired as professor of philology at the University of Copenhagen. His later works, besides tracts of the Society of Pure English, include *Negation in English and Other Languages* (1917); *Language, its Nature, Development, and Origin* (1922); *The Philosophy of Grammar* (1924); *Mankind, Nation, and Individual* (1925); *Modern English Grammar* (1928); and *An International Language* (1928).

**JEWETT**, FRANK BALDWIN (1870- ). An American electrical engineer, born at Pasadena, Calif. He was graduated from Throop Polytechnic Institute in 1898, and then became a research assistant at the University of Chicago, receiving his Ph.D. there in 1902. During 1902-04 he was instructor of physics at the Massachusetts Institute of Technology, then entered the service of the American Telegraph and Telephone Company as transmission and protection engineer. In 1912 he joined the Western Electric Company of which he became chief engineer in 1916 and vice president in 1922. During the World War, he was a lieutenant colonel in the United States Signal Corps, receiving in 1919 a Distinguished Service Medal. In 1925 he became president of the Bell Telephone Laboratories, Inc. He was chairman of the Division of Engineering and Industrial Research of the National Research Council, 1923-27.

**JEWISH NATIONAL HOME**. See PALESTINE.

**JEWS AND JUDAISM**. The period from 1914 brought a radical transformation in the position of Jewry throughout the world. The two chief gains resulting from the War were the recognition of the Jews as citizens in countries such as Russia, Poland, and Rumania, where they had hitherto been legally oppressed, and the creation of a national Jewish homeland in Palestine. On the other hand, the distress and turmoil incident to the War wrought great havoc among the communities of eastern Eu-



rope which had always contained a majority of the race and caused the destruction of much life and property. The situation of the Jews in the war areas of eastern Europe during the actual military operations was, from an economic and political standpoint, little less than desperate. The suffering in Galicia and Russian Poland in 1915 worked especial hardships on the Jewish populations of those regions. The economic misery and commercial ruin continued in 1916 and was emphasized by the entrance of Rumania into the War and by the invasion of Bukowina and a greater part of Galicia by the Russians. In Russia, however, they enjoyed a freedom which they had not hitherto known. In that country, numerous schools were established for the children of refugees in interior cities. Further promise of better conditions in Russia accompanied the Russian Revolution, which emancipated 5,000,000 Jews within the boundaries of the Empire. The revolutionary Government abolished all restrictions on Jews and granted them full liberty and equality; but the activities against the middle class affected the Jews particularly and there was much distress in the cities. The Bolshevik government made efforts to give land to the unemployed, but as the financing of such an agrarian programme necessitated large funds, progress was slow.

Beginning with 1921, there were some evidences of improvement. The Soviet governments, working in close coöperation with the American Joint Distribution Committee, began to settle Jewish families in agricultural colonies in white Russia, the Crimea, and the Ukraine. By 1923, more than 35,000 Jewish families were tilling the soil in 160 of these colonies. In 1928 the Soviet governments announced they would contribute \$10,000,000 toward the extension of this work if Americans would match the sum; Julius Rosenwald immediately pledged a personal contribution of \$5,000,000.

Indeed, the year 1929 saw improved conditions in almost all of central and eastern Europe, with the exception of Hungary and Rumania. Up to 1925, the lot of the Jew in Poland had been hard, but from thence on a conciliatory spirit evidenced itself. Under the Pilsudski regime, official anti-Semitism abated, the *numerus clausus* in the universities was rescinded (1927), the State announced that it would support Jewish schools, a Jewish chair was created at the University of Warsaw, and a more liberal attitude was adopted toward the Jewish artisan and small merchant. By 1928 the Jewish bloc had disappeared in the Polish Sejm and Jews had rejoined their old parties. There was a decided increase in the number of Jewish members in the municipal councils. In Rumania, however, the State made few attempts to suppress the anti-Semitism of the student societies and excesses against Jews were characteristic of the whole period. At the close of 1927, a student assembly at Oradea viciously attacked the Jewish population and desecrated synagogues. In Hungary, the situation was very much the same. The *numerus clausus* prevented Jewish students from studying at the universities and so flagrant did official anti-Semitism become that in 1925 Hungarian Jews appealed to the League of Nations for relief. In 1928 the Government promised to remedy the situation, but student riots at Budapest and other places showed that the situation was not in hand.

In the United States, attacks against the Jews were largely the work of Henry Ford's *Dearborn Independent*, but these came dramatically to a close in 1927, when Henry Ford made a public apology to Louis Marshall for his having published the old slander of a secret Jewish conspiracy that was worldwide in its efforts (the so-called "Protocols of the Wise Men of Zion"). Henry Ford had been considerably embarrassed because of a libel suit for one million dollars that Aaron Sapiro, the leader in the movement for the creation of agricultural coöperatives, had at that time been successfully prosecuting against him. Ford's recantation put an instant end to the public attacks on Jews in the country. Anti-Semitism nevertheless continued to exist, but covertly. Jews, for instance, found it hard to obtain positions on college faculties, were barred from many clubs and summer hotels, etc. The result was a necessity to maintain a complicated communal machinery for the protection of their interests.

**Relief Work.** The Jews of the United States made extraordinary efforts to relieve the distress of their kinsmen in the regions of eastern and central Europe that had been devastated by the War. The chief American agency for the carrying on of this work was the United Jewish Campaign, which from 1915 to the close of 1926, had raised and expended almost \$65,000,000. By the end of 1929, more than \$80,000,000 will have been spent according to plans announced in the spring of the year. Up to 1921, the programme frankly was concerned with relief. It was estimated that the homes of fully 50 per cent of the Jews in eastern Europe had been destroyed; that immediately after the War there were 50,000 refugees in Poland, 60,000 in Rumania, etc. In Poland, in one year (1925), the United Jewish Campaign helped 165,000 persons with small loans, spent \$35,000 on the feeding of unemployed workmen, spent \$52,000 on the feeding of school children, and distributed free milk to 151,000 nursing children. After 1921, the campaign concentrated its activities on the laying out of a programme of rehabilitation. It financed Jewish coöperatives, helped in the building up of industries, and made possible the settlement on the land of 35,000 Jewish families in Russia. It also interested itself in the economic restoration of Palestine. In 1926 the campaign announced the launching of a drive for another \$25,000,000 for the continuance of these projects, and, by 1928, \$21,000,000 of this had been raised.

**Statistics.** It was estimated by the *American Jewish Year Book* that there were 15,324,515 Jewish persons in the world. The following were the more important Jewish populations: Austria, 350,000; Canada, 126,196; British Empire, 514,442; Czechoslovakia, 354,342; France, 200,000; Germany, 564,379; Great Britain, 279,000; Hungary, 473,310; Lithuania, 155,125; Palestine, 157,800; Poland, 2,854,000; Rumania, 900,000; Russia (U.S.S.R.), 2,820,429; and United States, 4,228,029. In 1915 the Jewish population of the United States had been placed at 2,500,000. In 1927 New York City had 1,765,000 Jews (one-third of the city's population), Chicago had 325,000 and Philadelphia, 270,000. An interesting phenomenon of the period under survey was the gradual dispersion of the Jews over the United States. The result was the disappearance of the old ghettos and the settlement of Jews in newly-developed middle-class areas.

This was notably true of New York City. The same tendency resulted in the movement of Jewish families to smaller communities. See ZIONISM; PALESTINE, under *History*.

**JOFFRE**, zhôfr', JOSEPH JACQUES CÉSaire (1852- ). A French soldier (see VOL. XII). He was Commander-in-chief of the French Armies on the western front from the outbreak of the World War until December, 1916, when he was transferred to Paris as "technical adviser to the Government" and made a Marshal of France, the first to receive that title since 1870. In the spring of 1917, he was sent on a mission to the United States, then to the Far East, and after the War, to Spain and Rumania. In 1920 he returned to the Higher War Council. He was elected a member of the Académie Française in 1918, received the British Order of Merit in 1919, and wrote *La Préparation de la Guerre et la Conduite des Opérations (1914-15)* (1920). Consult *Maréchal Joffre et ses batailles*, by Reaouly (1916) and *Joffre*, by Hanotaux and Fabry (1921).

**JOHN**, AUGUSTUS EDWIN (1878- ). A British painter (see VOL. XII), president of the National Portrait Society. With his vivid manner of portraiture and his ability to catch unerringly some striking and usually unfamiliar aspect of his subject, he superseded Sargent as England's fashionable portrait painter. He was commissioned by Canada during the World War to paint Canadian soldiers on the western front. In 1921 he was made an associate of the Royal Academy, and in 1928 a member. Among his later works may be mentioned "Symphonie Espagnole," "Robin," "The Mumpers," "The Tinkers," and "Madame Suggia," which was presented to the British nation by Sir Joseph Duveen.

**JOHN**, SIR WILLIAM GOSCOMBE (1860- ). A British sculptor, who was born at Cardiff and trained at the Cardiff School of Art, London School of Art, the Royal Academy Schools, and in Paris. His principal works include the statues of Edward VII at Cape Town; Prince Christian Victor at Windsor; David Lloyd George at Carnarvon, and equestrian statues of Edward VII at Liverpool; Viscount Wolsey, Horse Guards Parade, London; and General Sir Stanley Maude at Bagdad. Also the memorials to the Marquis of Salisbury and the Earl of Cromer in Westminster Abbey; Dean Vaughan in Llandaff Cathedral; Viscount Leverhulme in Christ's Church, Port Sunlight; Sir Arthur Sullivan in St. Paul's Cathedral, and numerous others. His works are in the Tate Gallery, London; Glasgow Art Gallery; National Museum, Cardiff. He was knighted in 1911.

**JOHNS HOPKINS UNIVERSITY**. This non-sectarian institution for men and women (women are excluded from some undergraduate courses) at Baltimore, Md., was founded in 1876. The student enrollment increased from 1374 for the summer and autumn sessions of 1914-15 to 5575 in the autumn, and 1107 in the summer sessions of 1928; during the same period the faculty increased from 268 to 575. The library was increased from 174,777 to 300,000 bound volumes, the productive funds from \$6,226,287 to \$24,947,011, and the income from \$521,205 to \$2,110,221. The School of Hygiene and Public Health was established by the Rockefeller Foundation in 1916 and opened in 1918; in 1922 the Foundation gave \$600,000 to the school for endowment and building funds. Fire destroyed

the pathological laboratory in 1919 and a larger building was completed in 1923 through a gift of \$400,000 for this purpose from the General Education Board. An alumni memorial dormitory and a women's clinic were also built in the same year. In the summer of 1923, construction was started on a chemical laboratory to cost approximately \$500,000; a new building for the School of Hygiene and Public Health, constructed at a cost of \$1,000,000, was occupied in September, 1925; and the new Welch Medical Library, for which Dr. William H. Welch spent two years in Europe selecting books, was the outstanding addition to the physical plant in 1928. This building houses the libraries of the school of medicine, hospital, and school of hygiene and public health.

Joseph de Lamar, who died in 1919, bequeathed \$2,500,000 for instruction and research in medicine, and the General Education Board added \$100,000 to the William H. Welch Endowment for Clinical Education and Research in 1917, in order to make possible more work in the department of pediatrics, and also gave \$250,000 to strengthen the work in the laboratory departments of the medical school. The William H. Collins Vickers chair in archaeology was founded in 1920; \$200,000 was received from the estate of Eugene Mergenthaler for scientific research; and \$20,000 from the estate of Mrs. J. A. J. Creswell, for instruction and research in international law. During 1925 friends of Dr. William H. Wilmer made a gift of \$3,000,000 to establish at the Johns Hopkins Hospital an ophthalmological clinic and at the school of medicine a department of ophthalmology. The Rockefeller Foundation also made a gift for the establishment of the Institute for Biological Research, and in the following year, the General Education Board gave \$175,000 for this institute, as well as \$200,000 to establish a professorship in the history of medicine. In the autumn of 1928, the new Institute of Law was established, President, Frank Johnson Goodnow, LL.D. resigned in 1929 and was succeeded by Professor Joseph Sweetman Ames, Ph.D.

**JOHNSON**, ALLEN (1870- ). An American historian and editor, born at Lowell, Mass. He was graduated from Amherst College in 1892 and took postgraduate courses in Germany and in France and at Columbia University. He was appointed professor of history at Iowa (now Grinnell) College in 1898, serving until 1905, and from that year to 1910 was professor of history and political science at Bowdoin College. In the latter year, he became Larned professor of American history at Yale. He resigned that position to become editor of the *Dictionary of American Biography* in 1926. His published writings include: *The Intendant Under Louis XIV* (1899); *Stephen A. Douglas* (1908); *Readings in American Constitutional History* (1912); *Union and Democracy* (1915); *Jefferson and His Colleagues* (1921); *The Historian and Historical Evidence* (1926); *Readings in Recent American Constitutional History* (with W. A. Robinson, 1927). From 1918 to 1921, he was editor of *Chronicles of America*.

**JOHNSON**, ALVIN SAUNDERS (1874- ). An American economist (see VOL. XII). From 1912 to 1916, he was professor of economics at Cornell University, and from 1916 to 1918 was professor of political science at Leland Stanford, Junior, University. After 1917, he was also editor of the *New Republic*, New York City,

and after 1923 director of the New School for Social Research there. His later books include *The Professor and the Petticoat*, a novel (1914); *John Stuyvesant, Ancestor* (1919). Since 1927 he has been assistant editor of the *Encyclopædia of the Social Sciences*.

**JOHNSON, DOUGLAS WILSON** (1878- ). An American geologist, born at Parkersburg, W. Va. He was graduated from the University of New Mexico in 1901 and received his Ph.D. at Columbia University (1903). After teaching in public schools, he entered the United States Geological Survey as a field assistant (1899), and was later an assistant professor of geology at the Massachusetts Institute of Technology until 1907. He was also lecturer in physiography at Harvard University during 1906-12. Returning to Columbia in 1912, he became associate professor of physiography and after 1919 was professor. During the World War, he was connected with the intelligence work of the American Expeditionary Forces with the rank of major; and also served with the American Commission to Negotiate Peace. In addition to many scientific papers and bulletins, he is the author of *Lettre d'un Américain à un Allemand* (1916); *Topography and Strategy in the War* (1917); *Perils of Prussianism* (1917); *My German Correspondence* (1917); *Shore Processes and Shoreline Development* (1919); *Battlefields of the World War* (1921); *The New England-Adian Shoreline* (1925).

**JOHNSON, EDWARD** (1881- ). A dramatic tenor, born in Guelph, Canada. He studied in New York under Frank Dossert and J. A. Galloway and began his career as a concert singer in 1908. The next year he went to Florence, where he continued his vocal studies under Lombardi, and made a most successful operatic debut at Padua as Andrea Chénier (January, 1912), under the stage-name of Edoardo di Giovanni. In the same year he won triumphs in several Italian cities, so that in the fall of 1913 he was engaged for La Scala, in Milan, where he created the title rôle in the Italian première of *Parsifal*, under Toscanini (Jan. 1, 1914). In 1916-17 he sang in Buenos Aires, São Paulo, Rio de Janeiro, and Montevideo, and the next year was heard in Madrid and Lisbon. He made his American début with the Chicago Opera Company as Loris in Giordano's *Fedora* (Nov. 20, 1919) and remained with that organization until 1922, since when he has been a member of the Metropolitan Opera House. On coming to Chicago, he resumed his real name. He ranks among the foremost oratorio and concert singers of the day. In 1920 he was made Officer of the Crown of Italy. Among the many rôles that he created are the principal tenor rôles in Montemezzi's *Amore dei tre Re* and *La Nave*; Puccini's *Tabarro*, *Suor Angelica*, and *Gianni Schicchi*; Pizzetti's *Fedra* and *Fra Gherardo*; Taylor's *The King's Henchman*.

**JOHNSON, EMORY RICHARD** (1864- ). An American educator (see Vol. XII). Since 1919 he has been dean of the Wharton School of Finance and Commerce, University of Pennsylvania. He was assistant director of the Bureau of Transportation of the War Trade Board and also acted as expert and adviser to several other important government boards during the World War. His later books include *History of Domestic and Foreign Commerce in the United States* (1915); *The Panama Canal and Commerce* (1916); *Principles of Railroad Transporta-*

*tion* (1916); *Principles of Ocean Transportation* (1917); *The Ocean Freight Service* (with G. G. Huebner, 1925); *Interpretative Essays on China and England* (1927); *Principles of Transportation* (with Grover G. Huebner, and G. Lloyd Wilson, 1928).

**JOHNSON, HIRAM WARREN** (1866- ). An American lawyer and legislator (see Vol. XII). He served as Governor of California for the term 1911-15 and was reelected for the term 1915-19, but resigned in 1917 following his election as United States Senator from California for the term 1917-23. He was reelected in 1922 for the term 1923-29 and in 1928 for the term 1929-35. Senator Johnson was a leader of the Progressive element of the Republican Party in the Senate and in 1920 was one of the leading candidates for the Republican nomination for the Presidency. He was also a candidate in 1924 for the nomination, but practically abandoned his efforts in April of that year.

**JOHNSON, JAMES WELDON** (1871- ). An American editor and author, born at Jacksonville, Fla. He was graduated from Atlanta University in 1894 and took postgraduate courses at Columbia University. After acting as principal of a high school for colored pupils in Jacksonville, he was admitted to the Florida bar in 1897. In 1901 he began practice in New York. He served as United States Consul in Venezuela and in Nicaragua from 1906 to 1912, and then became secretary of the National Association for the Advancement of Colored People. With his brother, J. Rosamond Johnson, he wrote for the light-opera stage. He was awarded the Spingarn Medal in 1925. His publications include *The Autobiography of an Ex-Colored Man* (1912); *Fifty Years and Other Poems* (1917); and *The Book of American Negro Poetry* (1921); *The Book of American Negro Spirituals* (1925); *Second book of Spirituals* (1926); *God's Trombones* (poems, 1927).

**JOHNSON, MARTIN (ELMER)** (1884- ). An American explorer, who has recorded the wild animal life of Africa in moving pictures. He was born at Rockford, Ill., and attended the public schools of Independence, Kan. Since 1910 he has made, with his wife, Osa Helen Lighty Johnson, six expeditions around the world. He lived many years in the South Sea Islands and in Africa. He was the only member of Jack London's *Snark* expedition to complete the voyage in 1917. In 1924-29 he made a film record of the vanishing wild life of Africa for the American Museum of Natural History, New York. He is the author of *Through the South Seas with Jack London* (1912); *Cannibal Land* (1917); *Camera Trails in Africa* (1924); *Safari* (1927); and *Lion* (1929).

**JOHNSON, ROBERT UNDERWOOD** (1853- ). An American poet and editor (see Vol. XII). During the World War he organized and was chairman of the American Poets' Ambulance in Italy. This organization presented 112 ambulances to the Italian Army in four months. In 1918-19, he was president of the New York Committee of the Italian War Relief Fund of America. Since 1919 he has been director of the Hall of Fame (New York University). He served as Ambassador to Italy from April, 1920, to July, 1921, and represented the United States as observer at the San Remo Conference of the Supreme Council of the League of Nations, in April, 1920. For his War services, he was decorated by the Italian, French, Belgian, and Serbian

governments. His later books include *Poems of War and Peace* (1916); *Italian Rhapsody and Other Poems of Italy* (1917); *Collected Poems* (1919); *Remembered Yesterdays* (1923).

**JOHNSON, TREAT BALDWIN** (1875- ). An American chemist, born at Bethany, Conn. He was graduated in 1898 from Yale, where he also received his Ph.D in 1901. He became an instructor of chemistry at the Sheffield Scientific School of Yale and in 1908 was advanced to the assistant professorship of organic chemistry of which branch he became full professor in 1913. He has published papers on organic synthesis as applied to therapeutic substances, on phrenanthrene and its relation to morphine, an account of new local anesthetics, histamin, tyramin, and cyclic polypeptides. He is a member of the National Academy of Sciences. In 1915 he received the Nichols Medal of the American Chemical Society.

**JOHNSON, WALTER** (1888- ). Professional baseball player, born at Humboldt, Kan. He is recognized as one of the most effective pitchers the American National game has ever known. After a brief sojourn in an obscure Rocky Mountain league, he joined the Washington Club of the American League in 1907 and has been the mainstay in the box for that club ever since, contributing much to the winning of the world's championship by his team in 1924.

**JOHNSON, WILLIAM EUGENE** (1862- ). An American publicist and reformer, born in Coventry, N. Y. He was educated at the University of Nebraska and for several years was engaged in newspaper work. As chief special officer of the U. S. Indian Service (1908-11), he earned the sobriquet of "Pussyfoot" by securing more than 4400 convictions, chiefly of persons selling liquor to Indians. He edited several prohibitionist newspapers and after 1919 was director of the London office of the World League Against Alcohol. He lost an eye at a prohibition meeting in London in 1919 when struck by a missile. He has written several books and over 40 brochures on the alcohol problem.

**JOHNSON, WILLIS FLETCHER** (1857- ). An American editor, born in New York City. He was graduated from New York University in 1879, was on the editorial staff of the *New York Tribune* and its successor, the *New York Herald Tribune* (1894- ). He was also its literary editor (1917-20) and a contributing editor of the *North American Review* (1914- ). After 1914, he was honorary professor of the history of American foreign relations at New York University. He was a member of many societies and was the author of *Four Centuries of the Panama Canal* (1906); *America's Foreign Relations* (1916); *America and the Great War for Humanity and Freedom* (1917); *Life of Warren G. Harding* (1922); *Political and Governmental History of the State of New York* (1923).

**JOHNSTON, SIR HARRY HAMILTON** (1858-1927). An English public official and author (see Vol. XII). His later books include *A Gallery of Heroes and Heroines* (1915); *The Truth About the War* (1916); *The Black Man's Part in the War* (1917); *The Study of Bantu and Semi-Bantu Languages* (vol. i, 1919, vol. ii, 1922); *The Gay-Donbeys* (1919); *Mrs. Warren's Daughter* (1920); *The Veneerings* (1922); *Little Life-Stories* (1923); *The Story of My Life* (1923), and *Relations* (1925).

**JOHNSTON, JOHN** (1881- ). An American chemist, born at Perth, Scotland. He was a Carnegie scholar at St. Andrews, Scotland, and also studied at Breslau during 1905-07. Coming to the United States, he was a research associate in physical chemistry at Massachusetts Institute of Technology in 1907-08, and during 1908-16, chemist at the geophysical laboratory of the Carnegie Institution of Washington. He had charge of the research department of the American Zinc, Lead, and Smelting Company during 1916-17 and was chemist to the United States Bureau of Mines in 1917-18. In 1919-27 he was professor and chairman of the department of chemistry at Yale. Since 1927 he has been with the Department of Research and Technology of the U. S. Steel Corporations. During the World War, he served as secretary to the National Research Council. His original investigations have had to do with topics in geochemistry and physical chemistry on which he has published the results of his studies, notably in the *Journal of the American Chemical Society*.

**JOHNSTON, MARY** (1870- ). An American novelist (see Vol. XII). Her later books include: *The Fortunes of Garin* (1915); *The Wanderers* (1917); *Foes* (1918); *Michael Forth* (1919); *Sweet Rocket* (1920); *Silver Cross* (1922); *1492* (1922); *Croatian* (1923); *The Slave Ship* (1924); *The Great Valley* (1926); and *The Exile* (1927).

**JOHORE.** See MALAY STATES, NON-FEDERATED.

**JONES, EDGAR DEWITT** (1876- ). An American clergyman and author, born at Hearn, Texas, and educated at the University of Missouri and Illinois Wesleyan University. He became a minister of the Disciples of Christ denomination in 1901 and held pastorates in Kentucky, Ohio, Illinois, and at Detroit. During 1915-16 he was president of the Illinois Convention of the Disciples, and from 1917 to 1919 of the International Convention of the Disciples. From 1922 to 1928, he was on the staff of the *Detroit News*. Since 1927 he has been a member of the *Christian Century* staff. His writings include: *The Inner Circle* (1914); *The Wisdom of God's Fools* (1916); *Fairhope, the Annals of a Country Church* (1917); *The Tender Pilgrims* (1917); *Ornamented Orthodoxy* (1918); *When Jesus Wrote on the Ground* (1924); *The Wisdom of Washington and the Learning of Lincoln* (1924); *Roses of Bethany and Lilies of Arimathea* (1928).

**JONES, HENRY ARTHUR** (1851- ). A British dramatist (see Vol. XII). His later works include the plays *Oock o' the Walk* (1915), and *The Pacifists* (1917); and the books *Theatre of Ideas* (1915); *Shakespeare and Germany* (1916); *Patriotism and Education* (1918); *My Dear Wells* (1921, 2d. ed. 1922); *What is Capital?* (1925).

**JONES, HILARY POLLARD** (1863- ). An American naval officer, born in Virginia. He graduated from the United States Naval Academy in 1884, served in the Spanish-American War, and was in command of the Navy Yard in Washington from 1906 to 1909. He served on shore and afloat in many important capacities, and in 1917 was made commander of Squadron One, Patrol Force, Atlantic Fleet. In the same year, he was appointed commander of Division One, Cruiser Force, Raider Guard, of the Atlantic Fleet, and was director of the Naval Overseas

Division from January to July, 1919. He was vice admiral of the 2d Battleship Squadron of the Atlantic Fleet, from 1919 to 1921. He became an admiral on July 1, 1921, and from the latter date was commander-in-chief of the Atlantic Fleet and during 1922-23 of the U. S. Fleet. He was appointed Minister to Brazil on a special mission in 1922, a member of the General Naval Board in 1923, and delegate to the Conference for Limitations of Naval Armaments at Geneva in 1927. He was retired from active service in 1927.

**JONES, LAUDER WILLIAM** (1869- ). An American chemist, born at New Richmond, Ohio. He was graduated at Williams College in 1892, and received his Ph.D. from the University of Chicago in 1897. In the same year, he became an assistant in chemistry at Chicago, where he remained until 1907. From 1907 to 1918, he was professor of chemistry at the University of Cincinnati, and from 1918 to 1920, he was dean of the School of Chemistry at the University of Minnesota, after which he accepted a call to the chair of chemistry at Princeton. He has devoted his attention chiefly to organic chemistry and has published papers on nitro-paraffin salts, alkyl derivatives of hydro-oxylamin, preparation of hydroxamic acids from hydroxylamin of organic acids, electron conception of valence, and preparation of electromeres. During the World War, he served with the Chemical War Service as chief of the research section of offense. Dr. Jones is the author of *A Laboratory Outline of Organic Chemistry* (1911).

**JONES, ROBERT EDMOND** (1887- ). An American artist born in Milton, N. H., and educated at Harvard University. He started his career of designing for the theatre in New York City in 1911, and among his notable works are his designs for *The Man Who Married a Dumb Wife*; *The Jest*; *Richard III*; *The Birthday of the Infanta*; *Macbeth*; and *Redemption*.

**JONES, ROBERT TYRE, JR.** (1902- ). An American golfer. He was born at Atlanta, Ga., and in childhood was handicapped by a poor physique. Engaging in outdoor sports, and especially in golf, at an early age, he became sturdy so that at fourteen he was able to compete successfully with older players. In 1923 he won the American Open Championship in golf, in 1924 and 1925, the American Amateur Championship, and in 1926 the American Open and the British Open Golf Championship, being the first amateur in twenty-nine years to gain that coveted honor. In the following year, he again took the British Open as well as the American Amateur Championship. In 1928 (at the age of twenty-six) his record was summarized as follows: He had won eight national titles at match and medal play and a total of twenty-three out of twenty-four matches in which he had competed. He thus held first place among living golf players. In the meantime, he had completed a course at Harvard (S.B., 1924), engaged in the real estate business, and studied law. He has since practiced in Atlanta. In collaboration with O. B. Keeler he wrote *Down the Fairway: Golf Life and Play of Robert T. Jones, Jr.* (1927).

**JONES, WESLEY LIVSEY** (1863- ). A United States Senator (see VOL. XII). He was elected to the Senate from the State of Washington as a Republican for four terms (1909-33) and was chairman of the Senate Committee on Commerce. In 1929 he was the author of the

Jones Act increasing penalties for violation of the Prohibition Law.

**JONES LAW** (MERCHANT MARINE ACT OF 1920). See SHIPPING.

**JONGEN, JOSEPH** (1873- ). An eminent Belgian composer, born in Liège. While a student at the Conservatory there, he won prize after prize, finally carrying off the Prix de Rome with his cantata *Comala* (1897). The next four years he spent in further study in Berlin, Munich, Dresden, Leipzig, Paris, and Rome. In 1903 he became professor of harmony and counterpoint at the Conservatory of Liège, but resigned the following year and settled in Brussels, devoting his entire time to composition. At the outbreak of the World War, he fled to England, where he remained till 1919. In 1920-25 he was professor of counterpoint and fugue at the Brussels Conservatory, and then became its director. As a composer, he strives to follow the ideals of César Franck, but has not been able to withstand the influence of impressionism. His works comprise a symphony; two symphonic poems, *Lalla Roukh* and *Impressions d'Ardennes*; *Tableaux pittoresques* and *Fantaisie sur deux Noëls wallons* for orchestra; *Sinfonia concertante* for organ and orchestra; a concerto for violin and one for 'cello; *Fantaisie rhapsodique* for 'cello and orchestra; a mimo-symphonic legend, *S'Arka* (Brussels, 1912); and numerous works for chamber music.

**JONNART, zhôn-âr, CÉLESTIN AUGUSTIN CHARLES** (1857-1927). A French diplomat, who was born at Fléchin, Pas de Calais, and educated in the law. In 1882 he entered upon his political and diplomatic career by becoming chief of the cabinet of the Governor General of Algeria. He subsequently was director of Algerian affairs in the Ministry of the Interior, Minister of Public Works, a deputy from the Pas de Calais, president of the general council, Governor General of Algeria (1903-1911), and Minister for Foreign Affairs (1918). During the World War, he was the Inter-Allied High Commissioner in Greece, and was instrumental in causing King Constantine's abdication and bringing Greece into the War on the side of the Allies. In 1917 he left the Chamber for the Senate, was Minister of Blockade until the Armistice, again Governor General of Algeria, and chairman of the Reparations Commission. In 1921 when the French government resumed relations with the Vatican after 17 years, he was made Ambassador at the Holy See, but Herriot withdrew the Ambassador and he was recalled in 1924. He was elected to the French Academy of Political and Moral Sciences in 1918, and to the French Academy in 1923. Consult *M. Jonnart en Grèce et l'abdication de Constantin*, by Recouly.

**JONNESCO, THOMAS** (1861-1926). A Rumanian surgeon for many years professor of surgery in the University of Bucharest. He was known especially for his attempts to cure certain diseases by dividing some part of the cervico-thoracic sympathetic nerve and reported cures of angina pectoris—usually regarded as purely a degenerative affection—by this resource. His major writings comprise *La Rachianesthésie Générale* (1919), and *Le Sympathique Cervico-Thoracique* (1923). The division of the sympathetic nerve by his technique is known as Jonnesco's operation.

**JOSLIN, ELLIOTT PROCTOR** (1869- ). An American physician and authority on diabetes, born at Oxford, Mass. He received degrees in



arts and science at Yale (1890-91) and in medicine at Harvard (1895). He was assistant professor of theory and practice of medicine at the Harvard Medical School from 1912 to 1922, when he became clinical professor. His standard books, *The Treatment of Diabetes* (1916), and *A Diabetic Manual* (1918) have gone through several editions.

**JOUVENEL, GABRIELLE SIDONIE** (MME. HENRI) DE. See COLETTE.

**JOWETT, JOHN HENRY** (1864-1923). A British-American Presbyterian clergyman (see VOL. XIII). In 1918 he returned to England from New York, where he was Minister of the Fifth Avenue Presbyterian Church (1911-18), and became minister of Westminster Chapel. His later writings include *The Spirit of Christmas* (1914); *My Daily Meditation for the Circling Year* (1914); "Come Ye Apart," *Daily Exercises in Prayer and Devotion* (1920); *The Eagle Life and Other Studies in the Old Testament* (1922); and *The Friend on the Road and Other Studies in the Gospels* (1922). Consult *John Henry Jowett*, by Arthur Porritt (1924).

**JOYCE, JAMES** (1882- ). An Irish author, who was born and educated in Dublin, but spent his manhood in Rome, Trieste, Zurich, and Paris. His works were few: *A Portrait of the Artist as a Young Man* (1914); *Chamber Music*, a book of lyrics; *Exiles*, a play (1918); *Dubliners*, a collection of short stories about the slums of Dublin; *Ulysses* (1922); and *Pomes Penyeach*, poems, (1927). His first novel, *A Portrait* was well received; it contained lyrical powers and a dignity and honesty that marked it off: but it was *Ulysses* that made him the storm-centre of a bitter literary controversy. The novel has almost 500,000 words, little plot in the accepted sense, telling only of one day in the life of Mr. Bloom, and marks a violent break with the current technique. It was attacked for its crudities and its formlessness; and it was extolled for its frankness and the epic quality of its portraiture. He became a leader of Surrealism, which held that one should write very quickly and never rewrite.

**JOYNSON-HICKS, RT. HON. SIR WILLIAM, FIRST VISCOUNT** (1865- ). An English public official, who was born Hicks but assumed his present name on marrying Miss Grace Joynton in 1895. A Unionist, he stood for Parliament twice before he was elected in 1908. He was defeated in 1910, and reelected in 1911. He was active in church affairs and transportation and air problems, serving on many committees dealing with these matters. He was created a baronet in 1919, a member of the Privy Council in 1923, and a viscount in 1929. In 1922 he entered the Cabinet as Parliamentary Secretary of the Overseas Trade Department, and in the next year was successively Postmaster General and Paymaster General, Financial Secretary to the Treasury (with a seat in the Cabinet), and Minister of Health, holding the latter office until the resignation of the Baldwin government in January, 1924. In November of the same year, on the return to power of the Conservatives, he became Home Secretary. In this position, he had an important part in the conditions and orderliness of the country during the coal and general strikes of 1926, in the Arcos raid of 1927, which led to the break between Russia and England, and in the Prayer Book dispute. Besides temperance pamphlets, he wrote *The Law of Traction on Highways*; *The Command of the*

*Air*, speeches delivered in the House of Commons (1916); and *The Prayer Book Crisis* (1928).

**JUDAH, NOBLE BRANDON** (1884- ). An American soldier and diplomat. He was born at Chicago, trained in the public schools of that city, and graduated from Brown University (1904). After a law course at Northwestern University (LL.B., 1907) he was admitted to the bar. In 1911-12 he was a member of the Illinois Legislature. He was commissioned first lieutenant of Illinois Field Artillery at San Antonio, Tex., in 1916 and promoted to the rank of captain in the same year. In the World War, he served as major of the 149th Field Artillery, 42d Division, becoming lieutenant colonel in 1918. He was also assistant chief of staff, 1st Army Corps, A. E. F. He received the D.S.M., Legion of Honor, and Croix de Guerre with Palm. He engaged in law practice at Chicago (1919-27) and in December, 1927, was appointed Ambassador to Cuba. He resigned that post in June, 1929.

**JUGOSLAVIA.** Yugoslavia, or as it is officially known, "The Kingdom of the Serbs, Croats, and Slovenes," comprises the old kingdoms of Serbia and Montenegro, combined with certain provinces originally belonging to the Austro-Hungarian Monarchy. The country is situated in southern Europe, bordering on the Adriatic Sea; area, 96,134 square miles; population, census of 1921, 12,017,323. Yugoslavia is primarily an agricultural state, the great bulk of its population being agrarian, and most of its income is derived from farming and stock raising. Racially, the population is divided into Yugoslavs, 10,900,000; Germans, 560,000; Magyars, 450,000; Albanians and Turks, 550,000; Rumanes and Vlachs, 200,000; the remainder consisting of Italians and other nationalities. There is no dominant religion in the country, and freedom of worship is guaranteed. The majority of the people, however, are either Orthodox or Roman Catholic. The population is distributed by religions as follows: Orthodox, 5,602,227; Catholic, 4,735,154; Moslem, 1,337,687; Protestant, 235,000; and Jewish, 64,159. Cities of over 20,000 are Belgrade, 250,000; Zagreb, 150,000; Ljubljana, 60,000; Sarajevo, 75,000; Novi Sad, 45,000; Spalato, 35,000; and Nish, 30,000.

**Agriculture.** In 1926 there were 15,080,000 acres of arable land, 24 per cent of the total area; 11,239,000 acres of permanent meadow and pasture; 1,366,000 acres of trees, shrubs, and bushes, and 18,745,000 acres of forest. While there are many small landowners, there are still many large estates, particularly in the provinces of Slovenia, Vojvodina, and Slavonia. The problem of the breaking up of these large holdings is the chief problem of the agrarian reform. Pre-war grain yields in bushels were: wheat, 63,066,000; rye, 10,142,000; barley, 20,280,000; oats, 33,500,000; and corn, 111,892,000. The crops of all these cereals declined, as was shown by the 1927 production, wheat being then 56,568,000 bushels; rye, 9,923,000 bushels; barley, 14,449,000 bushels; oats, 20,114,000 bushels; and corn, 84,344,000 bushels. This decline in yield may be accounted for through the conversion of the land to other uses, principally fruit growing and stock raising. Besides the principal cereals enumerated, Yugoslavia also cultivates, in lesser quantities, buckwheat, millet, rice, lentils, beans, and peas. There are also increasingly large crops of tobacco and sugar beets, tobacco production having grown from

3,000,000 pounds, pre-war, to 14,748,000 pounds in 1927. Production of sugar beets in 1927 was 691,000 metric tons.

**Mining.** Mining was little developed in Yugoslavia in 1929, although a great diversity of minerals was known to exist. The industry only began to assume any real importance within the last century, with the exception of the provinces of Slovenia and Croatia (formerly parts of the Austro-Hungarian Empire). There were, however, many traces of old workings for gold and copper dating back to the days of the Roman Empire, and also to the Middle Ages. The principal minerals found in the country are brown coal, anthracite, bauxite (used in the manufacture of aluminium), lead, iron, copper, sulphur, antimony, silver, and gold. Petroleum and asphalt also occur in various parts of Yugoslavia, but not in large quantities. The large coal deposits are of great advantage to the industries of Yugoslavia, the principal mines being located in the provinces of Slovenia, the only drawback being that they consisted almost entirely of brown coal and lignite, which is inferior to the British, Belgian, and Silesian black coal, and in many cases is unsuitable for industrial consumption. All coal so far mined in Slovenia, Croatia-Slavonia, or Bosnia is of this inferior quality, the only anthracite being found in Serbia. Coal production for 1928 was 5,051,800 metric tons; for 1921, it was 2,949,103 metric tons. Production of iron ore in 1928 was 439,480 metric tons, copper ore was 327,800, and bauxite 49,260 metric tons, as compared with 101,000 in 1927, and 132,000 in 1926.

**Forest.** The forests of Yugoslavia cover about 32 per cent of her entire area, lumbering being one of the principal industries of the country. The forests are particularly valuable assets to the country because of their close proximity to the Mediterranean, whereas most of the other countries bordering on it had been more or less deforested, and the demand for Yugoslav timber is constantly increasing and exports of construction wood in 1928 were valued at \$1,184,000. The principal varieties of trees found are birch and oak, and in lesser quantities, fir, pines, and spruce. The provinces of Bosnia and Slovenia are the principal timber sections of the country.

**Industry.** The manufacturing industry of Yugoslavia is still in the early stages of its development and consists principally of flour-milling, weaving, tanning, boot making, pottery manufacturing, and iron foundries. In view of the immense water-power resources of the country, a great development in this phase of the industrial life is hoped for. One of the greatest difficulties in the development of manufacturing is the lack of proper railway facilities. In 1927 there were 6200 miles of railroads all owned by the state with the exception of 636 miles. In 1927 telegraph had 55,911 miles of line and telephone, 98,818 miles of line.

**Commerce.** The foreign trade of old Serbia in 1911 was: imports \$22,277,000, and exports \$22,564,000. These figures, however, do not afford a proper basis of comparison with statistics on foreign trade for post-war years, in view of the much greater present area of the country. Imports for 1928 were \$137,900,000. Exports for the same year were \$113,400,000, making for the second consecutive year an unfavorable trade balance. The principal countries of origin of imports are Czechoslovakia, Austria, Germany,

Italy, Hungary, and Great Britain. The principal countries of destination of exports are Italy, Austria, Czechoslovakia, and Hungary. Exports to the United States were valued at \$1,048,000 and imports from the United States at \$6,784,000. The principal items of import are textiles, metals and metal products, machinery and vehicles, and chemical and pharmaceutical products. The principal items of export are lumber, grain, cattle, meat products, eggs, and dried prunes.

**Shipping.** When the merchant marine of the former Austro-Hungarian monarchy was divided between Italy and Yugoslavia, the latter country obtained about 100,000 gross tons of shipping, though failing to secure any of the large steamers of important steamship companies. This merchant fleet had increased until by the end of 1928 it totaled approximately 300,000 gross tons. The various shipping companies receive subventions from the state, the total in 1927-28 amounting to 36,360,000 dinars (the dinar being valued at \$0.0176). The merchant marine early in 1928 in Yugoslavia aggregated 153 vessels with a combined gross tonnage of 242,000. Of this total number, 22 vessels of 110,000 tons, each over 4000 tons formed 45.2 per cent of the total. There are seven important steamship companies which control approximately 66 per cent of the total tonnage, the largest having 22.9 per cent in its fleet of 14 vessels.

**Finance.** Bank-note circulation at the end of 1927 was 5,743,000,000 dinars; gold reserve, 89,000,000 dinars. Average exchange rate of the dinar, 1913, \$0.193 (par); 1921, \$0.0237; 1922, \$0.0133; 1927, \$0.1762. The foreign pre-war debt, converted at par, was \$156,445,000 in 1927, but would be much less if discharged in paper currency of the several countries, due to their depreciated currencies. War debts to the British, French, and American governments, at par, were \$564,077,000; pre-war debts of Austria and Hungary (assumed), converted at agreed exchange rates, \$23,074,000. In addition, there were several foreign loans negotiated after the War. The total debt was approximately \$862,140,000 in 1926. Government receipts for the fiscal year 1927-28 amounted to 10,772,030,400 dinars and expenditures to 10,513,128,300 dinars while the budget for the year 1928-29 contemplated revenues of 11,555,794,000 dinars and expenditures of 11,592,794,000 dinars. For 1929-30 corresponding figures are 12,158,721,000 dinars and 12,158,672,800 dinars.

**Education.** Elementary education is compulsory and in the schools under the Ministry of Education is free. In 1926, there were 7208 elementary schools with 17,576 teachers and 786,324 pupils; number of secondary schools was 173, with 3595 teachers and 83,399 pupils; there are three universities located at Belgrade, Zagreb, and Ljubliana, with a total of 300 professors and 10,320 students.

**Government.** Yugoslavia is a constitutional monarchy, whose ruler in 1929 was Alexander I, former King of Serbia. The present constitution was adopted on Jan. 1, 1921, and provides for a single chamber called Narodna Skupština, consisting of 313 representatives elected for four years on the basis of one member for every 40,000 inhabitants. The military defense of the country is provided for by a peace-time army of 7000 officers and 120,000 men recruited on the basis of universal service. Compulsory service is en-

forced for men between the ages of 21 and 45 in the first line, and for men between 18 and 21 years and 45 and 50 years for the second line defense. The navy consists of 12 torpedo boats, 6 mine layers and 2 submarines.

**History.** While the new kingdom of the Serbs, Croats, and Slovenes did not become a reality until December, 1918, the idea of a unified Yugoslavia had been broached at intervals throughout the nineteenth century. Yugoslav unity, however, had suffered a serious setback in the creation of Austria-Hungary, which country played off Serbs against Croats and treated Serbia practically as a fief, and at the beginning of the twentieth century the idea was completely submerged. But from 1905 on, it grew steadily, fostered in the Dual Monarchy by Serbian influence. It was further promoted by Serbian victories in the Balkan War, and the hot-headed proposals of the student organizations, to which the assassins Princip and Gavrinoitch belonged, brought on unnecessary excesses. Throughout the War, Slavs in Austria-Hungary suspected of any sympathy with the patriotic propaganda were treated with the utmost cruelty. Thousands died in internment camps, wholesale confiscations occurred, and except in Croatia, every semblance of government disappeared from the provinces.

Abroad, the Yugoslav Committee headed by Dr. Trumbitch and Mr. Supilo kept confronting the Allies with the idea of Yugoslav freedom. Although it learned immediately of the terms of the Treaty of London of April, 1915, which brought Italy into the War through what was, in effect, a territorial betrayal of the Yugoslavs, its loyalty to the Allied cause suffered little inasmuch as the invasion of Serbia by the enemy occurred soon after. In 1917 the Yugoslav Club, made up of sympathizers in the Austrian Reichsrat, and the exiled Serbian government under Mr. Pashitch gave added support to the Yugoslav Committee. By Mr. Pashitch for the government, and Dr. Trumbitch for the Committee, the Corfu Declaration was signed, July 20, 1917. It set forth the principles of Yugoslav unity under the Karageorgevitch dynasty together with the democratic tenets of universal suffrage and freedom of religion.

In 1918 Yugoslavs and Italians agreed to cooperate in defeating the Dual Monarchy, and the ensuing disaffection from the Austro-Hungarian forces and their final collapse made certain the creation of a Yugoslav kingdom. Despite Italian disapproval and the efforts of Serbia to found a kingdom with itself as nucleus, an act of union was promulgated on Nov. 23, 1918, at Zagreb, capital of the ex-Austrian Slav provinces, and Prince Alexander was invited to take the throne of a united Yugoslavia. At the same time, King Nicholas of Montenegro was deposed and Montenegro joined the union. See MONTENEGRO.

The path of the new state was to be a thorny one in the beginning. Italy consistently refused its recognition of the accomplished fact of the Yugoslav state and at the Peace Conference unalterably insisted not only on the Treaty of London line but, in addition, Fiume. To the Yugoslavs, mediation by President Wilson of the whole Adriatic question was perfectly acceptable; to the Italians, aware of President Wilson's doctrines of self-determination and also understanding that on such a basis not all their claims could be substantiated, there was no way out but the Treaty of London. Wilson's pro-

posals they hotly rejected and Wilson's sensational declaration of Apr. 23, 1919, over the head of the Italian government, infuriated the Italian people. The Adriatic question continued intermittently to trouble the progress of southern European affairs for the next four years. For the D'Annunzio escapade, the succeeding conversations with the Supreme Council, the patched-up Treaty of Rapallo of Nov. 12, 1920, and finally the threatening gesture of Mussolini and the Peace of Rome of January, 1924, see the article FIUME-ADRIATIC CONTROVERSY.

Yugoslavia was, in a sense, the victor, for, excepting the cession of Fiume to Italy, the new line followed substantially Wilson's proposals of 1919. There were other questions that served to distract attention from domestic concerns and to prevent that reconstruction that was so sorely needed. The division of the Banat of Temesvár, which both Yugoslavia and Rumania claimed on ethnographic grounds, was not consummated until 1920, when, by the Treaty of the Trianon, Yugoslavia finally gained the western country (Torontál) as well as the Bačka district containing the large city of Szabadka. To the southwest, the Pan-Serbs agitated for the annexation of the Scutari region (northern Albania). Not until 1921 did Yugoslavia agree to relinquish her claims to this rich district, which included the valleys and outlets of the Drin and Boyana Rivers. Again, the settlement of the Austrian boundary line presented difficulties. By the treaty, a plebiscite had to be held in the Klagenfurt area before its disposition could be finally determined. In October, 1920, one of the two zones voted to remain in Austria, with the result that the whole area was restored. By the Treaty of Neuilly (November, 1919), Bulgaria was forced to give up to Yugoslavia, on the east, the Strumitsa district as well as the Tsaribrod and Bosilegrad districts.

Thus, not until 1921 was Yugoslavia ready to turn to the business of setting her house in order. In November, 1920, elections were held for members of a Constituent Assembly, and the meeting of that body, the first to represent the opinion of the new state, indicated something of the new loyalties. Cleavages were largely on racial and then on economic lines, although religious animosities were also apparent. Decentralization was particularly favored by the Catholic Croats and Slovenes, who feared the supremacy of the Orthodox Serbs. The Communists gathered about them the dissident spirits from the late enemy provinces, especially the Bačka, as well as the Mohammedans of Bosnia. The character of the new groupings may be adduced from the parties represented in the Constituent Assembly. There were 102 Radicals, 94 Democrats, 42 Communists, 51 Croatian-Agrarians, 33 Serb Agrarians, 25 Mohammedans, 21 of the Catholic People's Party.

As a result of these fundamental differences, the establishment of the new state proceeded slowly. Government by bloc was the only way out and could be carried on only as a result of the alliance of the Radicals and the Democrats, strengthened by the adherence of the Bosnian Mohammedans and the Slovene Agrarians. It was only on June 28, 1921, that the constitution, embodying the notion of a centralized Serb state, finally passed through the Assembly. Even then, this result could hardly have been achieved had not the entire Croat delegation of 161 members quit the body. Throughout 1922,

however, the new constitution was not promulgated, the rump Assembly remaining in control and the Government under Mr. Pashitch continuing in office despite well-authenticated charges of disregard for ministerial responsibility.

Communist outbreaks in 1921 added to the general uncertainty and were followed by harsh measures of reprisal in which the Communist members were expelled and the constitutional guarantees annulled. However, the increasing growth of the Peasant Party indicated the true temper of the country.

Jugoslavia is essentially agricultural and its problems centre in the development of its natural resources and the spread of its means of communication. To these, the country increasingly devoted itself and made as rapid headway as the vexatious administrative questions would permit. In the field of foreign affairs, the prevailing policy was conciliatory. By a series of conventions with Czechoslovakia and Rumania in 1920 and 1921, the Little Entente was constituted to check the Hapsburg pretensions; in October, 1923, Yugoslavs gained Greek permission for their use of the port of Saloniki; in 1924, an understanding was effected with Italy for the amicable settlement of the Adriatic problem. The friendliness of France contributed much toward strengthening the financial structure of the new state and the security of its national integrity. Jugoslavia was assured of a respectable place among Central European nations.

The first general election, March, 1923, gave the same groups that had controlled the Constituent Assembly, ascendancy in the national Parliament. Mr. Pashitch remained at the head of affairs, his party and that of the Democrats backing vigorously his resolute attitude toward the separatist Croats. Though in February, 1924, 98 Croats once more appeared to take their seats in the Parliament after an absence of four years, their policy continued hostile, as was shown by their opposition to the Fiume Treaty and their continual demands for Croatian independence. In March, and again in April, 1924, by combining with the other Opposition groups, the Croats succeeded in compelling Premier Pashitch to resign. Thanks to the King's continued confidence in him, the veteran leader returned to power, each time, with a reconstructed cabinet; but the significance of Croatian opposition was larger than mere cabinet juggling would indicate.

The important fact revealed by more than four years of Croatian obstruction was that the Croats, though willing to unite with their kinsmen in a decentralized Yugoslav nation, were irreconcilably opposed to the continued dominance of the Serbs in the new and enlarged nation. Territorial consolidation had proved to be but the first step toward genuine national unification, and the other steps remained to be made. The head of the Croat movement was Stephan Raditch, whose whole-hearted devotion to the cause of the Croat peasant earned him the regard of all the Balkan peoples. By 1924 he was a leader of the first importance in southeastern Europe. His strong leaning toward Russia, strengthened still further by a visit to Moscow in June, brought renewed fears on the part of the Government of a Communist uprising, and in July a number of arrests were made.

The return of Croatian representatives to the Assembly in the spring of 1924 so strengthened

the opposition that on July 18 the Pashitch ministry resigned. The Croats were not included in the succeeding Davidovitch ministry, but supported it for a time. Ever-growing dissension led to its resignation in October and in November the King decided to call general elections, meanwhile putting the government again in the hands of Pashitch. Toward the close of the year, the premier took drastic measures in dissolving the Croatian Peasants' Party. The year 1924 was signalized by an agreement with Bulgaria and an important treaty negotiated in January with Italy. The latter was a five-year treaty of friendship by which Jugoslavia granted to Italy full sovereignty over Fiume and received balancing concessions.

In the elections held in February, 1925, the Radical Party won 140 seats, which with the support of one of the minor factions gave it a slender majority. During the spring, however, a series of negotiations brought the Radical and the Raditch parties together and in July they formed a coalition government. Mr. Raditch with several other Croat leaders had been imprisoned since the first of the year. He was now set free and later received the post of Minister of Education in the cabinet and represented the country at the League of Nations meeting. For a while, political harmony seemed to reign, but the antagonism between the leading factions was too great to be permanently suppressed and in April, 1926, the premier resigned following the resignation of Croat cabinet members, including Raditch. The ministry was reorganized under M. Uzunovitch, with the Raditch Party represented in the cabinet although Raditch himself remained out.

The new Government maintained an uncertain lease of life until December. The storm that broke when the Treaty of Tirana between Italy and Albania was published swept out of office the Foreign Minister, M. Nintchitch, who had consistently followed a policy of accord with Italy, and the whole cabinet followed. In the midst of efforts to form a new government, the aged M. Pashitch died, leaving the already tangled situation still more involved. At the close of the year, M. Uzunovitch succeeded in bringing Radicals and Raditch Party leaders together once more in a new cabinet, but in its short life of four months, it had sufficient strength only to put through the budget.

The excitement over the Albanian situation continued to run high and was in part responsible for the ministry's resignation in April. It was succeeded by a coalition of Radicals and Democrats headed by V. Vukitchevitch. Elections held in September brought no particular changes, the existing government parties obtaining a substantial majority. Aside from the perennial political strife in domestic affairs, the Government at this time was occupied chiefly with strenuous efforts to form an alliance which would at least partially offset the advance of Italy in the Balkans. This was finally accomplished on Nov. 11, 1917, when a treaty of friendship and alliance was signed with France. Relations with Bulgaria became increasingly strained at this time because of the incessant border raids by bands of Macedonian "comitadjis," which Bulgaria seemed quite unable to suppress. The murder of the Yugoslav General Kovachevitch on Oct. 5, 1917, brought the situation to a most serious stage, but an actual clash between the two countries was happily avoided.

In 1928 the issue which had divided the country since its founding, the reiterated demands of the Croats, and to a lesser extent the Slovenes, for full autonomy, became more than ever a source of discord. It found expression particularly in the bitter opposition to the ratification of a pending treaty with Italy negotiated in 1925, which the Croats claimed sacrificed their interests to the Government's desire for support for a loan. In May, rioting and anti-Italian demonstrations became frequent. The climax to all the disorder came on June 20, when a Radical deputy, Punica Ratchitch, shot down five Croat party leaders, killing two outright and wounding Stephan Raditch and two others. Immediately, the land was in an uproar. The Croat deputies withdrew in a body from the Assembly and returned to Zagreb. There they declared a boycott on the Government, refusing even to recognize its envoys as long as any party in any way connected with the murders was in office. The Government did all it could to placate them.

When the crisis brought about the resignation of the ministry on July 4, the King requested the wounded Raditch to form a cabinet, but he refused. Anton Koroshetz, a Slovene clerical, then organized a government. On August 8, Stephan Raditch died and the whole of Croatia was plunged in mourning. In the absence of the Croat representatives, the Government readily put through the ratification of the Italian agreement. During the following months the Serb-Croat hostility grew more and more bitter, with frequent riots and much bloodshed. The Koroshetz ministry made several vain attempts at conciliation, even offering Croatia partial autonomy. In December, steps were taken apparently looking toward placing Croatia under military rule. With the Croatian situation but reflecting the condition of helplessness to which the whole civil government had arrived, it became apparent that the long years of party dissension and parliamentary inaptitude had brought governmental affairs to the breaking point. On December 30, the Koroshetz cabinet resigned, and after a week's futile effort to find in the political welter sufficient strength to form a stable government, the King at one stroke swept the whole parliamentary system into the discard, abolished the constitution, and set up a military dictatorship with General Zivkovitch as premier.

Although the *coup* and the dictatorship that followed it were quite in line with similar overthrows in Italy and other countries, it differed from them in that the King himself took over all power, and also in that he professed with apparent sincerity a devotion to democratic government and an intention ultimately to return to it. In his proclamation of Jan. 5, 1929, he asserted that "parliamentary government, which was always my own ideal as it was that of my unforgettable father, has been so abused by blind party passions that it prevented every useful development in the State." On January 6, decrees were issued making the King sole source of power with a ministry responsible to him alone, prohibiting communism and unduly nationalistic parties, limiting the freedom of the press, and doing away with all local elective bodies.

During the following months, successive measures were taken to safeguard the new regime and make it workable. On February 18, the King by decree created a Legislative Council to succeed the former Parliament, consisting of ex-

ministers, etc., and having practically none but advisory powers. The Government was reorganized in the interests of efficiency. Several newspapers were suppressed. On June 7, Punica Ratchitch was given a twenty-year prison term for the murders of a year before.

By the people of Yugoslavia, the setting-up of the dictatorship was accepted without enthusiasm and without particular protest. In foreign relations, the chief immediate reaction was Italy's declaration that no new treaty could be negotiated to replace the five-year pact of friendship which had expired in January, 1929, until the political situation should become more settled. Although the sponsors of the new regime professed to look forward to a resumption of parliamentary government, they admitted that it might be a long time before such objective could be realized, and in midsummer of 1929 the country faced an indefinite continuation of one-man rule.

**JUGOSLAV LITERATURE.** The unification of the literature written in the various sections of the Kingdom of the Serbs, Croats, and Slovenes has been very difficult to achieve and its progress has depended much upon the political relations between the different provinces. Before the World War, there was a growing tendency for young Serb writers to publish at Zagreb and, vice versa, for the Croats to have some of their works in the Serb journals. With this in mind, we must remember that there was an active literature in both sections of the country.

In Croatia, older writers, such as Anton Tresić Pavičić, a poet and novelist of Dalmatia, had largely withdrawn from the field and turned the literary output over to men of the younger schools which followed rather closely the predominant tendencies in western Europe. Those in Serbia had been more largely under Russian influence, but there was a number of prose writers and poets, among whom were Jovan Dušić, Milan Rakić, and Miličić. Again, the only author who has become known abroad is Bishop Nikolaj of Ochrida, who, as the Rev. Nikolaj Volimirović, won fame as a preacher in St. Paul's Cathedral, London, where he had gone in connection with the education of Serb refugees.

Slovene literature has developed rather apart from the other groups. Ivan Cankar, the leading writer, died in 1918. He had long been moved, as it were, by a religion of beauty and was a genuine meditative lyric poet. Since his death, the leading poet is Oton Zupančič, who continues the tradition of love for his country and a real and serious attitude toward his art. There are at present no outstanding prose authors.

Modern Yugoslav literature, taken as a whole, has not yet reached the heights attained in the Middle Ages; yet we can be sure that the vigor and the energy that are being put forward will in a short time bring forth a national contribution to world literature.

**JUNG, CARL GUSTAV (1875- ).** A Swiss psychologist and psychoanalyst. Jung, who was the earliest convert to the new doctrines of Freud, was at that time assistant to Prof. Paul E. Bleuler the psychiatrist of the Zurich University, who also was favorably disposed to the new departure. All of his works are in English translation: *Psychology of Dementia Praecox* (1909); *Theory of Psychoanalysis* (1912); *Analytical Psychology* (1916); *Psychology of the Uncon-*



scious (1916); *Studies in Word Association* (1918); *Psychological Types* (1923), and *Contributions to Analytical Psychology* (1928). During 1925-26 he studied primitive psychology among the natives of North Kenya, Africa. Jung has divided all mankind into extraverts and introverts with many subdivisions. See **PSYCHOLOGY**, **ABNORMAL**, and **PSYCHOANALYSIS**; **ASSOCIATION TESTS**.

**JUNIOR COLLEGES.** See **UNIVERSITIES AND COLLEGES**.

**JUNIOR HIGH SCHOOLS.** See **EDUCATION IN THE UNITED STATES**.

**JUSSERAND**, zhü's'-rän', JEAN ADRIEN ANTOINE JULES (1855- ). A French diplomat and scholar (see VOL. XIII), Ambassador to the United States (1902-25). He had profound knowledge of English literature and life, and was a member of many American and British, as well as French, learned societies and academies. His later works include: *A Literary History of the English People* (1913); *With Americans of Past and Present Days* (1916); *The School for Ambassadors, and other Essays* (1924); and "The Historian's Work" in *The Writing of History* (1926). Consult *Great Men and Great Days*, by Stéphane Lauzanne (1921).

**JUTLAND, BATTLE OF.** See **WORLD WAR, Naval Operations**.

**JUVENILE COURTS.** Although the first juvenile courts were established about 1900, from 1914 there was great activity in the formulation of principles and the development of methods of administration. In 1914 a report of the special committee of the National Probation Association, appointed to consider juvenile courts and their administration, was published in book form under the title *Juvenile Courts and Probation*, by Bernard Flexner and Roger N. Baldwin. This statement of the aims of the juvenile court and detailed discussion of the means by which its purposes may be realized, together with the educational work of the National Probation Association, of State organizations supervising juvenile court work, and of individual judges and probation officers, brought increased recognition of the importance of the movement and the administrative standards that must be maintained. In 1923, following a series of studies made by the Children's Bureau of the United States Department of Labor and conferences held under the joint auspices of that Bureau and the National Probation Association, a detailed statement of Juvenile Court standards was published by the Children's Bureau and widely distributed.

Since it aims to save, rather than to punish, the delinquent child and to protect the neglected and dependent child, the ideal function of the juvenile court is not to determine whether or not a child has committed a specific offense, but through social investigations and physical and mental examinations, to ascertain the needs of each child and determine the treatment to be given. Children are to be kept in their own homes if possible and, if institutional care is needed, it must be educational and not punitive. To attain these ends, the procedure in children's cases must not be criminal in nature, and the court hearings must be entirely separate from the trials of adult offenders. The hearings must be private and informal, and must be held before a judge or referee who understands problem children and is able to use intelligently the resources which the community

and the State provide; and skilled probation service and facilities for expert study of the child's physical and mental condition must be available. It is desirable to keep children in their own homes, if possible, pending the hearing and determination of their cases and, if detention is required for their own welfare or the public safety, it must not be in jails or police stations, but in family boarding homes or special detention homes adequately equipped for constructive service.

These are the ideals of the juvenile court, but their realization, even in the larger cities, is far from complete and, in many small towns and rural districts throughout the country, children are still subjected to publicity, criminal procedure, jail detention, and treatment that can not be effective because of the absence of facilities for the study of the child and for skilled probation service. Nevertheless, real progress has been made in the extension of juvenile-court principles and practice. In 1910 legislation authorizing probation in children's cases was on the statute books of 38 States and the District of Columbia, but the application of this legislation was mainly confined to the larger cities. Eight years later, juvenile-court laws having been passed in every State except two, and laws authorizing probation in children's cases in every State except one, a survey was made by the Children's Bureau of the United States Department of Labor, covering 2034 juvenile courts and other courts hearing children's cases. This study showed that of an estimated 175,000 children's cases in 1918, 125,000 were heard by courts with some degree of special organization, and that such service existed in all the large cities and in 71 per cent of the cities having populations of from 25,000 to 100,000. The minimum degree of specialization used as a basis of comparison in this survey was separate hearings for children, officially authorized probation service, and the recording of social information. Only 321 courts, or 16 per cent of those reporting, had even this minimum; and almost half these courts were in five States. It was found that many States were not fully carrying out their laws. From at least one court in every State came reports of detaining children in jails, and in 37 courts in 18 States, no effort was made to separate children detained in jails from adult offenders; more than one-fourth of the courts with probation service reported that no provision whatever was made for physical examination and relatively few courts had facilities for mental examinations. Although authorized in every State but one, probation service was known to have been used during the year in only 45 per cent of these courts with jurisdiction over children.

Unfortunately, in many of the States, the juvenile court has been converted into a general catch-all. Here has been assigned the jurisdiction over mothers' pensions, adoptions, cases involving feeble-minded children, even domestic relations. In very few instances has the complete attention been concentrated on the original definition of the juvenile court, i.e., as an agency for preventing and treating delinquency. In one respect, a technique has been developed—that of the probation worker. It has become a regular, paid service whose workers, if necessary, are prepared to reconstruct the child's family, school, and vocational and recreational relationships.

In addition to providing means of investigating the social history of the child and his family, of giving physical examinations and treatment and routine mental tests, there has been made an effort to probe even deeper. It has been found necessary to link up the juvenile court with the psychiatric clinic. The first of these joint efforts was tried in Chicago in 1909. Since 1922, to demonstrate the importance of a psychiatric point of view, the Commonwealth Fund of New York has been financing the assignment of psychiatric clinics to selected communities for limited periods, and also has been supporting training courses for psychiatric social workers and probation officers given by the New York School of Social Work.

One of the most difficult aspects of the work is the creation of measuring sticks for the purpose of evaluating the success of the courts. In 1928 the director of the U. S. Children's Bureau was able to report that only 42 juvenile courts throughout the country were coöperating in the uniform reporting of statistics of delinquency, dependency, and neglect. Another stumbling block is an adequate definition of delinquency. In Boston, for example, children are arrested for the most trivial offences such as fence-climbing, bathing without a suit, etc., and no cases are adjudicated outside the court. In Chicago, children are brought in only for the relatively

serious offenses; the police officers adjudicate most of the cases outside the courts and comparatively few are entered on the dockets. Are statistics from the two cities in any way comparable? Again, there is the matter of treatment. In Chicago, the proportion of commitments to institutions is great; in Boston, delinquents are sent to highly-selected foster homes; in Cincinnati, the whole procedure is more or less informal, there are few psychiatric examinations and, after a talk with the judge, the delinquent boy or girl in the great majority of cases is placed on probation in his own home under the custody of his parents. What has been the result? Boston, with its highly technical procedure has been no more successful than Chicago with its institutional commitments or Cincinnati with its haphazard examinations and its neglect of the careful study usual in the better type of juvenile courts. All this has led W. I. Thomas and D. S. Thomas in *The Child in America* (1928) to come to this conclusion: "It suggests that we have idealized the juvenile court as an institution and that its successes, where it has successes, are not closely correlated with the procedure but due to unknown causes." Thus, an experiment that started out under such great expectations closes at the time of writing (1929) on what must be considered an uncertain note.

# K

**KAHN**, kân, GUSTAVE (1859– ). A French novelist and critic (see Vol. XIII). In 1924 he became editor of *Menorah*, a semi-monthly Zionist publication. His later works include *La Childebert* (1926) and *Fantini-Latour* (1927).

**KAHR**, GUSTAV VON (1862– ). A German public official, born at Weissenburg. He was active in the establishment of the Bavarian Republic, and from March, 1920, to September, 1921, was Minister-President. He came into conflict with the Reich government over questions of authority and resigned his post, largely as a result of the opposition of General Ludendorff and other reactionaries. In 1923 he was appointed general commissioner of state in full charge of the government and held this position during the attempt of Adolf Hitler and General Ludendorff to overthrow the Government. The failure of this attempt resulted in the arrest of Hitler and Ludendorff. See *BAVARIA*.

**KAISER**, kîzër (F. K.) GEORG (1878– ). A German playwright of the expressionist school. He was born at Magdeburg, attended college and engaged in commerce at Buenos Aires. After 1901 he devoted himself to the drama. He is the author of *Die Bürger von Calais* (1914); *Von Morgen bis Mitternacht* (1916, produced in New York in English translation, 1919); *Die Koralle* (1918); *Gas* (1920); *Gilles und Jeanne* (1923); *Kolportage* (1924); *Zweimal Oliver* (1926); and *Die Sorina* (1927).

**KAISER**, ISABELLE (1866–1925). A Swiss author, who wrote in German and French (see Vol. XIII). Her later works include *Le Vent des Cimes* (1916); *Rahels Liebe* (1921); *Hilda, die Heze* (1921); and *Die Nächte der Königin*, short stories (1924).

**KALEDIN**, ALEXEI (1861–1918). A Russian general born at Usti-Chozher (Dongebiet) of a Cossack father. In 1914 he led the 12th Division of Cavalry, in 1915 he was wounded and imprisoned in Austria, and in 1916, free again, he commanded the 8th Army. His masterly conduct of the campaign of Volhania and the capture of Lutsk gaining for him the title of "Hero of Lutsk." On the outbreak of the Revolution in 1917, the Cossacks elected him commander-in-chief. When he found that his struggle against Bolshevism was useless, he committed suicide in February, 1918.

**KALININ**, MIKHAIL IVANOVICH (1875– ). A Russian Communist chairman of the Central Executive Committee of the Russian Socialist Federation of Soviet Republics since 1919. He went to work in a St. Petersburg cartridge factory at the age of fourteen, joined the Social-Democratic Party in 1898 and for his political activities was exiled to Siberia a number of times, the first in 1899. Released from prison following the revolution of 1917, he took an active part in the Bolshevik movement. In 1919 he was elected a member of the central committee of the Communist Party. He wrote, in German,

*Was tut die Sowjetmacht für die Verwirklichung der Demokratie?* (1926).

**KALLEN**, HORACE MEYER (1882– ). An American philosophical writer. He was born in Silesia, Germany, was taken to the United States at the age of four, educated at Harvard University, the Sorbonne, and Oxford. He was named by William James as editor of his unfinished book, *Some Problems in Philosophy* (1910). After teaching at Harvard (1908–11), he went to the University of Wisconsin (1911–19). When the New School of Social Research was organized in New York City, he was appointed lecturer in philosophy. He is the author of *William James and Henri Bergson* (1909); *Creative Intelligence*, with John Dewey and others (1916); *The Structure of a Lasting Peace* (1918); *Zionism and World Politics* (1921); *The League of Nations, and To-day and Tomorrow* (1921); *Culture and Democracy in the United States* (1924); *Education, the Machine and the Worker* (1925); *Why Religion?* (1927); and *Freedom in the Modern World* (1928).

**KAMENEV**, LEV BORISSOVITSCH (1883– ). A Russian Communist journalist, diplomat, and political leader, born in Moscow. A former coeditor of the *Pravda*, Petrograd, several times banished from Russia for his revolutionary activities, he became a member of the central committee of the Communist Party in 1917 and was one of the negotiators of the Brest-Litovsk Treaty with Germany in 1918. From 1918 to 1925, he was president of the Moscow Soviet and from 1924 to 1926 president of the Council of Labor and Defence. In December, 1925, and again in 1927, he joined with Trotsky and others in opposing Stalin, the Soviet chief executive. He served as Ambassador to Italy (1926–27) and was also president of the All-Russian Central Executive Committee. In 1921 he wrote *The Soviet Republic in the Capitalist World*.

**KAMERUN**, kâ'me-rōon'. Formerly a German protectorate on the west coast of Central Africa, but since its capture by British and French troops in 1916, part of the British and French Empires under the names of British Cameroon and French Cameroon. See *CAMEROON*, *BRITISH*; and *CAMEROON*, *FRENCH*.

**KANAVEL**, ALLEN BUCKNER (1874– ). An American surgeon, born at Sedgwick, Kan., and educated at Northwestern University (Ph.B. 1896; M.D. 1899). After studying in Vienna, he joined the faculty of Northwestern University where he was successively lecturer, assistant professor and, after 1919, full professor of surgery. He became widely known through a classical monograph entitled *Infections of the Hand*, which was passed through several editions. He is also associate editor of *Surgery, Gynecology and Obstetrics*.

**KANDEL**, ISAAC LEON (1881– ). An American educator, born in Rumania. He studied in Manchester, England, and at Columbia and Jena universities. For several years, he taught in universities in Ireland and from 1908

to 1910 was scholar and teaching professor at Columbia University. In 1915-23 he was associate in education at Teachers College, Columbia University, after 1923 professor of education there, and in 1914-23 was specialist of the Carnegie Foundation for the Advancement of Teaching. He is the author of *Elementary Education in England* (1914); *Federal Aid for Vocational Education* (1917); *Education in Germany* (1918); and *Reports on Education in Great Britain, Ireland, Germany and France* (1919). He edited: *Twenty-five Years of American Education* (1924); *Educational Yearbook of the International Institute* (1925); *The Classics in Germany, England, and France* (1925); and *French Elementary Schools* (1926).

**KANSAS.** The thirteenth State in size (82,158 square miles) and the twenty-fourth in population; capital, Topeka. The population increased from 1,690,949 in 1910 to 1,769,257 in 1920, a gain of 4.6 per cent; estimated population, 1928, 1,835,000. The white population rose from 1,634,352 (1910) to 1,708,906 (1920); Negro, from 54,030 to 57,925. Foreign-born whites decreased in number from 135,190 to 110,578. The urban population mounted from 493,790 to 617,964; the rural fell from 1,197,159 to 1,151,293. The growth of the principal cities was as follows: Kansas City (q.v.), 82,331 to 101,177; Wichita, 52,450 to 72,217; Topeka, 43,684 to 50,022.

**Agriculture.** Kansas is one of the most important of agricultural States. Conditions since the War have been greatly affected by the general agricultural situation in regard to wheat and other grains, for accounts of which, see AGRICULTURE, CORN, WHEAT, etc. The number of farms increased very slightly, from 165,286 in 1920 to 165,879 in 1925. The total acreage in farms was 425,179 in 1920, but fell to 43,729,129 in 1925. The improved land in farms embraced 30,600,760 acres in 1920. The acreage of crop land in 1925 was 23,896,507. The total percentage of land in farms decreased from 86.8 in 1920 to 83.6 in 1925. The total value of farm property rose from \$2,039,389,910 in 1910 to \$3,302,806,187 in 1920, but declined to \$2,504,339,779 in 1925; the average value per farm being \$11,467 in 1910, \$19,982 in 1920, and \$15,097 in 1925. In interpreting these values, the inflation of the currency incident to the War is to be taken into consideration. Of the total number of farms in 1925, 95,149 were operated by owners; 729, by managers; and 70,001, by tenants. The comparative figures for 1910 are 111,108; 1835; and 65,398. White farmers in 1920 numbered 104,048, compared with 176,150 in 1910; native-born, 146,859, compared with 150,346; foreign-born, 17,187, compared with 25,804; colored, 1238, compared with 1691. In 1920 the number of dairy cows was 681,207; in 1925, 380,150; "beef" cows, 912,892 in 1920, 923,148 in 1925; mules, 243,332 in 1920, 260,163 in 1925; sheep, 361,102 in 1920 and 314,894 in 1925. The number of swine had decreased greatly during a decade (from 3,037,000 in 1910 to 1,816,000 in 1920); but it rose to 2,196,569 in 1925. The estimated production of the chief farm crops for 1928 was as follows: Corn, 179,118,000 bushels; wheat, 177,833,000; oats, 37,729,000; barley, 17,661,000; potatoes, 7,560,000; and hay, 4,646,000 tons. Comparative figures for 1913 are corn, 23,424,000 bushels; wheat, 86,983,000; oats, 34,320,000; barley, 1,994,000; potatoes, 2,920,000; and hay, 1,350,000 tons.

**Mining.** The principal mineral products of the State are petroleum, zinc, natural gas, and coal. There is considerable production of lead. The progress of the petroleum industry during the period since 1914 is indicated by these figures: production in 1914, 3,103,585 barrels; 1916, 8,738,077; 1917, 36,536,125; 1918, 45,451,017; 1920, 39,005,000; 1922, 31,766,000; 1926, 41,498,000; 1927, 41,069,000; 1928, 38,596,000. The increased production in the later years indicates a remarkable development in the new petroleum fields throughout the State. The coal production in 1914 was 6,860,988 short tons, valued at \$11,238,253; 1917, 7,184,975, \$16,618,277; 1918, 7,561,947, \$22,028,142; 1920, 5,926,408, \$22,923,000; 1921, 3,466,641, \$13,333,300; 1927, 3,442,762, \$9,648,000; 1928, 2,809,724, \$6,861,000. The value of clay products has varied widely from \$1,905,961 in 1914 to \$2,064,520 in 1918; \$4,021,740 in 1920; and \$3,969,040 in 1926; the increased value in years coinciding with the War was due largely to the decreased purchasing power of money and the consequent higher prices. Shipments of cement, exclusive of natural cement, varied from 3,237,906 barrels in 1914 to 4,158,399 in 1920; 3,643,582 in 1921; and 6,141,937 in 1927. In addition to products mentioned above, the State produces a considerable quantity of gypsum, natural gas, and sand and gravel. The total value of the mineral products in 1926 was \$165,000,612, compared with \$198,097,758 in 1920, \$120,759,783 in 1919, \$149,902,091 in 1918, and \$25,866,351 in 1914. In 1927 the mineral production was valued at \$120,368,526. Kansas ranked tenth among the States.

**Manufactures.** While Kansas is chiefly an agricultural State, it is also important industrially. There are 17 cities which have a population of more than 10,000, the combined populations of which form 23.6 per cent of the total for the State. In 1919, 72.1 per cent of the total value of the State's manufactures were reported from these cities. There were in the State in 1914, 3136 manufacturing establishments; 3474 in 1919; 1860 in 1925; 1856 in 1927. Persons engaged in manufactories as wage earners numbered 41,259, 61,049, 46,078, and 45,368, respectively, in those years; and the capital invested amounted to \$163,789,752 (1914) and \$357,534,129 (1919). The value of products in 1914 amounted to \$322,234,194; 1919, \$913,667,094; 1925 \$698,096,115; 1927, \$681,570,334. While the increase in the value of the product in 1914-19 was in great measure due to changes in industrial conditions brought about by the War, the increase in the average number of wage earners clearly indicated growth in manufacturing activities in the State. The most important industry in point of value of products is that connected with slaughtering and meat packing, the value of the product being \$151,647,000 in 1914; \$427,663,000 in 1919; \$249,465,885 in 1927. Flour-mill and gristmill products ranked second; they were valued at \$72,895,000 in 1914; at \$206,881,000 in 1919; at \$133,625,683 in 1927. Petroleum refining, in the third place, amounted to \$8,923,000 in 1914 and to \$73,878,325 in 1927. The chief manufacturing cities in the State are Kansas City, Topeka, and Wichita. In Kansas City, there were 165 establishments in 1909, with a product valued at \$164,081,000; 196, with \$468,686,000 in 1919; products totaled \$296,646,000 in 1925. In Topeka in 1909, there were 202 with \$17,821,000; 161, with \$20,685,000 in 1914; and 169, with \$45,708,000 in 1919; in 1909,

Wichita had 223, with \$10,267,000; 199, with \$11,668,000 in 1914; and 199, with \$57,789,969 in 1927.

**Education.** Educational progress has been sustained in recent years. The Legislature passed at various times many measures designed to improve the educational system. A rural high-school measure of 1915 permitted legal electors residing in territory containing not less than 16 square miles and comprising one or more townships or parts thereof to establish rural high-school districts. Under this law, over 240 rural high schools were soon organized. The Legislature of 1923 passed an act reorganizing the county high-school system, abolishing normal county high schools and creating community high schools and providing for the payment of tuition in connection therewith; and by the end of 1923, 26 such high schools had been established. The same Legislature passed a measure for carrying out the law of 1917 relating to vocational education; and useful legislation relating to the blind and deaf and dumb. The name of the normal schools of the State was changed to teachers' colleges. A Board of Administration was authorized to make a survey of the southwestern part of the State and to determine the advisability of establishing State teachers' colleges. The school population of the State (minors from 5 to 17 years, inclusive) was, in 1925-26, 473,094; the public-school enrollment was 424,907; in 1923 it was 427,310. Kansas has always been among the States with the lowest percentages of illiterates. Its percentage decreased from 2.8 in 1910 to 2 in 1920; among the native-born, from 1.1 to 0.7 per cent; among the foreign-born, from 10.3 to 10.2; among the Negroes, from 15.9 to 11.2.

**Finance.** State expenditures in the year ended June 30, 1927, as reported by the U. S. Department of Commerce, were: for maintenance and operation of governmental departments, \$14,254,973 (of which \$691,604 was aid to local education); for conducting public-service enterprises, \$440,562; for interest on debt, \$1,215,202; for permanent improvements, \$9,105,088; total, \$25,015,825 (of which \$9,773,112 was for highways, \$1,789,743 being for maintenance and \$27,983,369 for construction). Revenues were \$27,086,679. Of this, property and special taxes formed 39.3 per cent; departmental earnings and charges for officials' services, 11.5 per cent; and sales of licenses and the tax on gasoline, 34.8 per cent. Property valuation was \$3,674,105,303; State taxation thereon, \$9,502,190. Net State debt on June 30, 1927, was \$24,836,544.

**Political and Other Events.** In 1914 there were elections for United States Senator and governor and other State officers. Senator Bristow, a candidate for renomination on the Republican ticket, was opposed by Charles Curtis and by Victor Murdock, Progressive leader of the House of Representatives. Mr. Curtis received the Republican nomination and was elected. Arthur Capper, Republican, was elected governor. A constitutional amendment providing for the recall of public officials was adopted. In 1916 Governor Capper was reelected. In spite of this fact, President Wilson carried the State, receiving 314,588 votes, to 277,658 for Charles E. Hughes. In 1918 Governor Capper was elected United States Senator on the Republican ticket, and Henry J. Allen, Republican, was elected governor. In 1919 a general strike in the coal fields of the State resulted in the taking over of the mines by the State authorities under the

direction of Governor Allen and their operation by volunteers. The Legislature in this year created an Industrial Court, before which should be brought all matters in dispute between employers and employees in what the law describes as "basic industries," including food, fuel, clothing, and all public utilities. In 1920 Senator Curtis was reelected to the Senate, and Henry J. Allen was reelected governor. In the presidential voting of this year, Warren G. Harding received 396,195 votes; James M. Cox, 185,447. Constitutional amendments were adopted at this election, relating to promotion of farm home-owning, against the increase of farm tenancy, and for the promotion of good roads. The Kansas Court of Industrial Relations was reorganized and, at the close of the year, 28 industrial cases had been filed, 20 of these by labor organizations, and in 13 cases wage increases had been granted. On Apr. 9, 1920, strikers in the coal mines were arrested and placed in jail for ignoring the summons of the Industrial Court. On April 30, the Industrial Court was declared constitutional by the State Supreme Court. On Feb. 7, 1921, Alexander Howat, the leader in the coal-mining strike, was arrested by the authorities of the Industrial Relations Court for calling a strike in violation of an injunction. He was convicted. In 1922 the Democrats came into power, electing as governor Jonathan M. Davis. In his campaign, he spoke against the Industrial Court and promised a reduction of taxes. Although the Legislature did not act adversely, the functions of the Industrial Court were greatly curtailed by a decision of the United States Supreme Court on June 11 that the court had no power to fix wages. See LABOR ARBITRATION.

The vote for President in 1924 was: Coolidge, 407,671; Davis, 156,319; LaFollette, 98,461. Ben S. Paulen, Republican, was elected governor in 1924 and reelected in 1926. In 1928 the presidential vote was: Hoover, 513,672; Smith 193,003. Clyde M. Reed, Republican, was elected governor.

**Legislation.** Several measures passed in 1915 were designed to strengthen the prohibition laws of the State. The Legislature of 1917 amended the laws relating to the administration of the State government and created a State manager for State institutions; enacted a general prohibition law; and amended the child-labor law. The Legislature of 1921 abolished the Industrial Welfare Commission and conferred its powers on the Court of Industrial Relations; created a State aircraft board; made provision for the establishment and maintenance of city planning commissions in cities of the first class; and imposed a penalty for the failure to employ the English language exclusively in teaching in the elementary schools. A Public Utilities Commission was created and provision was made for the organization of rural high-school districts and for the consolidation of school districts for educational purposes. An election was authorized to be held in 1922 on the question of compensation of veterans of the War. This proposal, carrying \$25,000,000 in bonds, was carried by the people. The Legislature of 1923 accordingly passed a soldiers'-bonus law. It also authorized a board of administration to make contracts for the drilling of oil and gas wells on land under its control belonging to the State, where there is a State institution on such land within two miles of one or more producing oil wells. The Legislature of 1923 submitted to the



people to be voted on at the general election of 1924 a constitutional amendment permitting the Legislature to distinguish among subjects of taxation. A law of 1909 prohibiting cigarettes was repealed in 1927; life imprisonment for persons convicted of a third felony was provided. A special session in 1928 framed a constitutional amendment to give the highway administration adequate control of funds.

**KANSAS, UNIVERSITY OF.** A coeducational State institution of higher learning at Lawrence, Kan., founded in 1864. Between 1914 and 1928, student enrollment increased from 2812 to 4224, with 1683 in the summer of the latter year; faculty membership from 200 to 280; and the library from 100,000 to 200,000 volumes. Chancellor, Ernest Hiram Lindley, LL.D.

**KANSAS CITY.** The largest city in Kansas. The population increased from 82,331 in 1910 to 108,851 in 1920 and to 118,300 in 1928, by estimate of the Bureau of the Census. This includes the suburb of Rosedale, which was annexed in 1922. The area is 22 square miles. In 1924 a city-planning and zoning ordinance was adopted, designed to take care of the growth of the city for the next 40 years. Since 1924 several buildings of unusual architectural interest have been erected in Kansas City. Among these are the Commercial National Bank Building in Italian Renaissance style, the \$500,000 War Memorial Hall in Roman Doric style, and the Wyandotte County Court House erected at a cost of \$1,000,000 in Greek Doric style. The William Rockhill Nelson Gallery of Art, named for the man who was instrumental in beautifying Kansas City, is under construction on the site of his home at Brush Creek. In the main business districts of the city, 22 commercial buildings, including four large office buildings, have been erected since 1924. In 1926, 1763 building permits, valued at \$3,423,676, were issued. Extensive improvements also have been made of the city's water and light facilities, \$2,600,000 of a \$4,000,000 bond issue having been expended for this purpose. A 125-acre airport has been constructed in the Fairfax district, one of five industrial districts distributed throughout the city. In 1925 there were 160 manufacturing establishments in Kansas City, employing 14,336 persons who received \$17,871,613 in wages; the value of products manufactured was \$290,790,130. The assessed valuation of property in Kansas City in 1927 was \$138,991,000; the net debt was \$12,870,000.

**KANSAS CITY.** An important industrial and railroad centre of Missouri. The population increased from 248,381 in 1910 to 324,410 in 1920 and to 391,000 in 1928 by estimate of the Bureau of the Census. The area is 58 square miles. In 1920 home-rule charter-making powers were acquired by the city, and in 1926 the city-manager plan of government was adopted. According to this plan, a council of nine members is elected, one of whom acts as mayor, while the city manager is chosen by the council. Between 1914 and 1924, a viaduct and double-deck bridge, a 14-mile boulevard, a 15-mile sewer system, and a dyke for flood protection were built by the city. Bond issues for municipal improvements since 1924 include \$8,500,000 for the construction of trunk sewers, \$11,000,000 for a new municipal water system, \$1,000,000 for the purchase and improvement of a 688-acre municipal airport, \$500,000 for a municipal river terminal, and \$250,000 for Swope Park, one of the largest

municipal parks in the United States. Kansas City is the home of the Federal Reserve Bank of the tenth district, and one of its finest structures is the Federal Reserve Bank Building. Other edifices which have been recently constructed are the 24-story Southwestern Bell Telephone Building, the R. A. Long Building, the Commerce Building, the First National Bank, the New England National Bank, and the Kansas City Life Insurance Building. In 1927, 470 building permits, valued at \$15,215,875, were issued. The Liberty Memorial, including a shaft with a crucible at the top in which a fire is to burn constantly, a hall of records, and a fraternity house, was dedicated on Armistice Day, 1926. The value of manufactured goods rose from \$189,732,860 in 1923 to \$221,349,000 in 1927. In 1925, 25,576 persons were employed in approximately 500 manufacturing establishments and received \$32,884,000 in wages. Kansas City has 60 national and state banks and trust companies with total resources of \$362,657,674 and 61 building and loan associations with total resources of \$72,084,620. The assessed valuation of property in 1927 was \$500,879,000; the net debt was \$43,430,000. In June, 1928, the Republican National Convention was held in the great Convention Hall.

**KANSAS WESLEYAN UNIVERSITY.** A coeducational institution under the auspices of the Methodist Episcopal Church, founded in 1885 at Salina, Kansas. The number of students increased from 149 in 1910 to 966 in the fall of 1928; in the same period, the faculty increased from 20 to 35, and the number of volumes in the library from 12,000 to 16,000. A physics laboratory was equipped in 1920 and an administration building, with an adjoining auditorium seating 1500 persons, the total cost of which was \$250,000, was completed in 1928. Departments of liberal arts, commercial science, music, and fine arts are maintained leading to the degrees of bachelor of arts, bachelor of science, bachelor of music and bachelor of science in commerce. A special gift of \$25,000 for the retiring of the bonded indebtedness of the University was made in 1928 by Walter P. Chrysler. The General Educational Board pledged \$100,000 toward endowment provided all indebtedness be liquidated by Jan. 1, 1930, and that an additional \$200,000 endowment be secured. President, the Rev. L. B. Bowers, D.D.

**KAPP, káp, WOLFGANG VON (1858-1922).** A German revolutionist, born in New York City, where his father, Friedrich Kapp, a well-known Liberal leader, was in exile. He founded the Agricultural Credit Institute of East Prussia, which was very successful. During the World War, he was one of the leading representatives of the Junkers and bitterly opposed all measures taken to establish a republic. In March, 1920, he headed a conspiracy to obtain control of the Government. This was at first successful, and he was installed as Imperial Chancellor. He endeavored to form a government but was frustrated largely by a universal strike, which rendered him powerless. The movement collapsed on March 17, and he fled from Berlin, escaping by airplane to Sweden.

**KAPP PUTSCH.** See TRADE-UNIONISM, Germany; GERMANY, under History.

**KARAFUTO.** See SAKHALIN.

**KARAKHAN, LEO M. (1889- ).** A Russian Communist journalist, diplomat, and public official. He was a member of the Russian delega-

tion which signed the Brest-Litovsk Treaty, served as Minister to Poland (1921-22) and Ambassador to China (1924-26), and since the latter year has been Assistant People's Commissary for Foreign Affairs.

**KARELIA CONTROVERSY.** See FINLAND, RUSSIA.

**KARL I, EMPEROR OF AUSTRIA AND HUNGARY.** See CHARLES I.

**KAROLYI, kârô-lyé, MICHAEL, COUNT** (1875- ). A Hungarian statesman born in Budapest of a family historically prominent. In 1910 he became a member, and in 1913 chairman, of the Independence Party, and urged universal suffrage. Before and during the World War, he manifested strong pacifism and outspokenly condemned German policies. When defeat was realized, he was called on (Oct. 31, 1918) to form a ministry, his first task being to conclude an armistice with General D'Esperey, commander on the Macedonian frontier. In January, 1919, he became provisional President of the Hungarian Republic. His endeavors to restore order were frustrated by the Bolshevik propaganda under Bela Kun, and he resigned in March, 1919, living in exile thereafter. In 1925 when his wife became ill in the United States, he applied for a visa to join her and was given one on condition that he refrain from political activity while there. The action of the Government was severely criticized by liberals in the United States. In September, 1928, he visited that country again, but was permitted only a limited stay. He wrote *Fighting the World* vol. i, *The Struggle for Peace* (1924). See HUNGARY, under *History*.

**KARPINSKI, LOUIS CHARLES** (1878- ). An American mathematician, born at Rochester, N. Y., and educated at Cornell University, Columbia, and Strassburg. He taught mathematics at Berea (1898-1900) and at the Oswego (N. Y.) Normal School during 1903-04, but in 1904 accepted a call to the University of Michigan where in 1919 he became full professor of mathematics. Dr. Karpinski has devoted his attention chiefly to the history and pedagogy of mathematics. An authority on the history of science, he was collaborator on the *Archivio di Storia della Scienza* and author of *The Hindu-Arabic Numerals*, with D. G. Smith (1911); *Robert of Chester's Latin Translation of the Algebra of Khwarizmi* (1915); and *Unified Mathematics*, with H. Y. Benedict and J. W. Calhoun (1918). Professor Karpinski also wrote *History of Arithmetic* (1925).

**KASPROWICZ, JAN** (1860-1926). A Polish writer, born at Szymbork. His principal works were *Christus* (1891); *Von bauerlicher Scholle* (1891); *Weltuntergang*, a play, (1891); *Liebe* (1894); *Johannisnachtmärchen* (1900); *Der untergehenden Welt* (1901). He also translated works of Shakespeare, Goethe, Shelley, Byron, Tennyson, Rostand, and Hautmann.

**KATANGA.** See COFFER.

**KATO, kâtô, TOMOSABURO, BARON** (1859-1923). A Japanese admiral and statesman (see VOL. XIII). In the World War, he was commander-in-chief of the First Fleet which guarded Allied transportation from German raiding in the Pacific. After the War, as Minister of Marine, he began to build up Japan's navy. He headed the Japanese delegation to the Disarmament Conference at Washington and afterward won his government's consent to the treaty. His appointment as Premier in June, 1922, was

regarded as a check to the military party. See JAPAN, under *History*.

**KAUFFMAN, REGINALD WRIGHT** (1877- ). An American author (see VOL. XIII). He served on the Mexican border in 1916 and enlisted in 1917 for service in France. His later books include *The Latter Day Saints*, with Ruth Wright Kauffman (1917); *The Azure Rose* (1918); *Our Navy at Work* (1918); *Victorious* (1919); *Money to Burn* (1924); *The Ranger of the Manor* (1924); *Spanish Dollars* (1925); *Seventy-Six!* (1926); *Overland Trail* (1927); *Man of Little Faith* (1927).

**KAUFFMAN, RUTH WRIGHT** (Mrs. REGINALD WRIGHT) (?- ). An American writer and war correspondent, born in New York City, and educated at Bryn Mawr and in Paris, at the Collège de France. During 1905 and 1906, she investigated women's work in department stores, offices, and domestic service, and in 1909 she investigated "white slavery" in the United States and Europe. During the World War, she was correspondent for *Leslie's* and for the *Christian Herald* and was the first woman correspondent at the American front in France. In 1918 she was connected with the publicity department of the American Red Cross. Her writings include: *Women War Workers* (1919); *Three Little Kittens* (1922); *The Boundary Line* (1923); *The "I-Don't-Want-To" Series*, for children (1924); *Route Barrée* (1925).

**KAUFMAN, GEORGE S.** (1889- ). An American playwright, born at Pittsburgh, Pa. For several years he conducted humorous daily columns in the *Washington Times* and the *New York Evening Mail* and was subsequently on the dramatic staff of the *New York Tribune* and of the *New York Times*. He was the author, with Marc Connelly, of many successful plays, including *Dulcy* (1921); *To the Ladies* (1922); *Beggar on Horseback* (1924); *The Butter and Egg Man* (1925); and with Edna Ferber, *The Royal Family* (1927).

**KAUTSKY, kout'ski, KARL JOHANN** (1854- ). An Austrian Socialist (see VOL. XIII). He was one of the most important and prolific writers among the Social Democrats of Germany. During the World War, he supported the Government. In 1919 he published four volumes of documents, pertaining to pre-war history, with marginal notes by the ex-Kaiser, which raised a storm in Germany. In 1920 Kautsky appealed to American Socialists to help reestablish the Socialist Internationale. He was strongly anti-Bolshevik. His later works include *Der Politische Massenstreik* (1914); *Die Vereinigten Staaten Mitteleuropas* (1916); *Die Befreiung der Nationen* (1917); *Serbien und Bulgarien in der Geschichte* (1917); *Habsburgs Glück und Ende* (1918); *Demokratie oder Diktatur?* (1918); *Die Sozialisierung der Landwirtschaft* (1919); *Wie der Weltkrieg Entsteht* (1919); *Delbrück und Wilhelm II* (1920); *Georgien* (1921); *Von der Demokratie zur Staatskaskaverei* (1921); *Die proletarische Revolution und ihr Programm* (1922); *Die materialistische Geschichtsauffassung* (1927).

**KAWAKAMI, K. K.** (1875- ). A Japanese writer, born in Tokyo, who was educated in the law in Japan. In 1901 he came to the United States and studied at the universities of Iowa and Wisconsin. In 1905, engaged in journalism, he traveled extensively in China, Siberia, and Russia. He was a correspondent for leading newspapers in Tokyo and a frequent contributor

KELLOGG-BRIAND TREATIES



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FRANK BILLINGS KELLOGG  
FORMER SECRETARY OF STATE OF THE UNITED STATES



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ARISTIDE BRIAND  
MINISTER OF FOREIGN AFFAIRS OF FRANCE



to American magazines and newspapers. In 1921-22 he covered the Washington Disarmament Conference for the New York Herald Syndicate, and in 1927 he went to Europe for Japanese newspapers. In English his writings include: *Political Ideas of the Modern Japan* (1903); *Asia at the Door* (1914); *Japan and World Politics* (1917); *Japan and World Peace* (1919); *The Real Japanese Question* (1921), and *Japan's Pacific Policy* (1922).

**KAYE-SMITH, SHEILA** (?- ). An English novelist, born at St. Leonard's-on-Sea. Her first published novel was *The Tramping Methodist* (1908). This attracted wide attention and was followed by *Star Brace* (1909); *Spell-land* (1910); *Isle of Thorns* (1913); *Three Against the World* (1914); *Sussex Gorse* (1916); *Little England* (1918); *Tamarisk Town* (1919); *Green Apple Harvest* (1920); *Joanna Godden* (1921); *The End of the House of Alard* (1923); *The George and the Crown* (1925); *Joanna Godden Married, and Other Stories* (1926); *Saints in Sussex*; *Poems and Plays* (1927), and *Iron and Smoke* (1928). She was at her best in country novels in which the influence of native traditions and environments on her characters was vividly portrayed.

**KAZAK REPUBLIC.** See **SIBERIA.**

**KEDAH.** See **MALAY STATES, NON-FEDERATED.**

**KEEN, WILLIAM WILLIAMS** (1837- ). An American surgeon (see Vol. XIII). His later works include *Treatment of War Wounds* (1917); *Medical Research and Human Welfare* (1917); *I Believe in God and Evolution* (1922); *Selected Papers and Essays* (1923); and *Everlasting Life* (1924). Also *Keen's System of Surgery*, issued in 8 vols. (1906-21). He has delivered numerous lectures defending animal experiments and was very active during the War in behalf of the Allies. He received special honors from England and France. In 1917 he was appointed a member of the National Research Council.

**KEITH, KÉTH, ARTHUR** (1864- ). An American geologist (see Vol. XIII). As a member of the U. S. Geological Survey, he was in charge of the Geologic Atlas of the United States east of the 100th meridian (1913-21). In 1926 he was appointed a professor in the graduate department of the University of Texas. In 1927 he was president of the Geological Society of America and in the following year was elected to the National Academy of Sciences. He wrote *Outlines of Appalachian Structure and Handbook of New England Geography*.

**KEITH, SIR ARTHUR** (1866- ). A British anatomist and anthropologist (see Vol. XIII). He was Fullerian professor of physiology at the Royal Institution, 1917-23, and its secretary from 1922 to 1926. Later, he was Conservator of Museum and Hunterian professor of the Royal College of Surgeons. In 1927 his address, "Darwin's Theory of Man's Descent," delivered as president of the British Association for the Advancement of Science, provoked widespread discussion and led to his publishing *Darwinism and What It Implies* (1928). He also edited and wrote numerous works on anatomy and anthropology, including: *Antiquity of Man* (1914, 2nd ed., 1925); *Menders of the Maimed* (1919); *Engines of the Human Body* (1920, 2d ed., 1925); *Nationality and Race* (1920); *Religion of a Darwinist* (1925); and *Concerning Man's Origin* (1927).

**KELANTAN.** See **MALAY STATES, NON-FEDERATED.**

**KELLOGG, FRANK BILLINGS** (1856- ). An American lawyer and diplomat (see Vol. XIII). In 1916 he was elected United States Senator from Minnesota for the term 1917-23 but was defeated for reelection in 1922. In 1923 President Harding appointed him American Ambassador to Great Britain to succeed George B. M. Harvey. On Mar. 4, 1925, he became Secretary of State in President Coolidge's cabinet. In 1928 he negotiated the multilateral treaty renouncing war, known as the Kellogg Pact. The honorary degree of LL.D. was conferred on him by Harvard University in 1929.

**KELLOGG, JOHN HARVEY** (1852- ). An American surgeon and hygienist (see Vol. XIII). His later works include *Colon Hygiene* (1915); *The Hygiene of Infancy* (1916); *The New Method in Diabetes* (1917); *Plain Facts*, a summary of some of his older writings (1917); *Auto-intoxication* (1918); *Rational Hydrotherapy* (1918); *The Itinerary of a Breakfast* (1919); *The Health Question Box* (1920); *The New Dietetics* (1921); *Tobaccoism* (1922); *The Natural Diet of Man* (1923).

**KELLOGG, OLIVER DIMON** (1878- ). An American mathematician, born at Linwood, Pa., and educated at Princeton and Göttingen. During 1902-05 he was an instructor at the John C. Green School of Science at Princeton, and during 1905-20 he was at the University of Missouri, where he became full professor in 1910. In 1919 he became a lecturer on mathematics at Harvard and in 1920 an associate professor there, attaining a full professorship in 1927. He has been interested in various problems of integral and differential equations, potential functions, and functional theory, on all of which he has published papers in mathematical journals.

**KELLOGG-BRIAND PACT.** This pact, also referred to as the multilateral treaty for the renunciation of war as an instrument of national policy, was ratified by the United States Senate Jan. 15, 1929, and by most of the nations of the world. Described as "potentially the biggest event in modern diplomatic history," the pact was the result of nearly two years of negotiation between the major powers. The American Secretary of State, Frank B. Kellogg, and the French Minister of Foreign Affairs, Aristide Briand, were its principal sponsors. The negotiations were inspired by the fact that the arbitration treaty between France and the United States was due to expire Feb. 27, 1928.

M. Briand took the initial step on Apr. 6, 1927, in a statement to representatives of the press, in which he suggested the abolition of war as between France and the United States. Interest in this proposal led to the exchange of six notes between M. Briand and Mr. Kellogg beginning in December, 1927. Secretary Kellogg desired to enlarge M. Briand's proposal to include a general multilateral treaty, not only between France and the United States, but between all the powers, Mr. Kellogg wished to ban all war, whereas M. Briand desired to limit the ban to wars of aggression. On Apr. 13, 1928, Secretary Kellogg invited the British, the German, the Italian, and the Japanese governments to join France and the United States in an agreement to sign a treaty the spirit and substance of which was that these governments formally condemned war as an instrument of



their national policy and renounced it in favor of the pacific settlement of international disputes.

To this, France made the following reservations: (1) that the proposed treaty should not become effective until all countries had signed it; (2) that the right of "legitimate defence" still remained; (3) that violation of the pledge not to engage in war by one country would automatically release all other countries; (4) that the treaty should not interfere with the previous obligations of France under the League Covenant, the Locarno agreements or any of her neutrality treaties. In the United States, Senator Borah suggested that if a multilateral pact was not to become an instrument of oppression, the failure of any one signatory to observe its engagement should automatically release the other signatories from their engagements toward the defaulter. It was with these qualifications that the French statesman agreed with the United States to the submission of the draft treaty for the consideration of the German, British, Italian and Japanese governments. The French reservations were not, however, referred to in the Kellogg treaty or letter of transmission.

Thus there were wide differences between the American and the French positions. Mr. Kellogg rejected the French reservations and the French opposed Mr. Kellogg's plan without reservations. Mr. Kellogg proposed to renounce war as an instrument of national policy without conditions. The French reserved for themselves the right to make war under the war clauses of the Covenant of the League of Nations, the treaties of Locarno, and their treaties of alliance. Mr. Kellogg was offering a substitute for alliances. The French proposed to adhere to their alliances. On Apr. 21, 1928, M. Briand made public an alternative draft of the Kellogg treaty embodying the French reservations. He then approved the transmission to the Governments of Great Britain, Germany, Italy and Japan by the United States of the original Briand proposal, and the six notes and other correspondence covering the subject subsequently exchanged between France and the United States. Mr. Kellogg's statement that the right of self defence was inalienable and unimpaired by the treaty provided the ground upon which the other governments announced their willingness to sign. Great Britain on May 19, 1928, accepted the treaty without reservations, but pointed out that for the British Empire the right of self-defence included that of protecting "certain regions of the world" vital to its welfare. A revised draft of Mr. Kellogg's original treaty was then sent out from Washington to fourteen other governments, including the signatories of the Locarno agreements and the British Dominions. It carried a new preamble embodying the French proposal that violation of the pact by any one signatory released the others and was accompanied by a covering letter setting forth the various reservations made and stating that the United States found them acceptable. The draft treaty, which was finally agreed upon, follows:

#### ARTICLE I

The High Contracting Parties solemnly declare in the names of their respective peoples that they condemn recourse to war for the solution of international controversies, and renounce it as an instrument of national policy in their relations with one another.

#### ARTICLE II

The High Contracting Parties agree that the settlement or solution of all disputes or conflicts of whatever nature or of whatever origin they may be, which may arise among them, shall never be sought except by pacific means.

#### ARTICLE III

The present treaty shall be ratified by the High Contracting Parties named in the preamble in accordance with their respective constitutional requirements, and shall take effect as between them as soon as all their several instruments of ratification shall have been deposited at Washington.

This treaty shall, when it has come into effect as prescribed in the preceding paragraph, remain open as long as may be necessary for adherence by all the other powers of the world. Every instrument evidencing the adherence of a power shall be deposited at Washington, and the treaty shall immediately upon such deposit become effective as between the power thus adhering and the other parties hereto.

It shall be the duty of the Government of the United States of America to furnish each Government named in the preamble and every Government subsequently adhering to this treaty with a certified copy of the treaty and of every instrument of ratification or adherence. It shall also be the duty of the Government of the United States of America telegraphically to notify such Governments immediately upon the deposit with it of each instrument of ratification or adherence.

In faith whereof the plenipotentiaries have signed this treaty in the French and English languages, both texts having equal force, and hereunto affix their seals.

Fifteen nations signed the treaty in the Salle de l'Horloge in Quai d'Orsay, Paris, on Monday afternoon, Aug. 27, 1928, a year and a quarter after M. Briand sent his message to the American people. The government heads who signed for the various nations were: Dr. Gustav Stresemann for Germany; Frank B. Kellogg for the United States; Paul Hymans for Belgium; Aristide Briand for France; Lord Cushendun for Great Britain; William Lyon Mackenzie-King for Canada; Alexander John McLachlen for Australia; Sir Christopher James Parr for New Zealand; Jacobus Stephanus Smit for South Africa; William Thomas Cosgrave for the Irish Free State; Lord Cushendun for India; Count Gaetano Manzoni for Italy; Count Uchida for Japan; A. Zales for Poland; Dr. Edward Benes for Czechoslovakia. M. Briand, in the only speech delivered at the ceremony, described the treaty as a "general reinsurance" of the work of the League of Nations. He said that henceforth war, branded with illegality, "is by mutual accord truly and regularly outlawed so that a culprit would incur the unconditional condemnation and probably the enmity of all its co-signatories."

On the day following the Paris ceremony, the United States government sent a note to 48 nations, inviting their adherence to the pact. The invitation to Russia was forwarded through France, inasmuch as the United States had no diplomatic relations with the Soviet Government. By Jan. 1, 1929, 21 nations had ratified the pact and on January 15 the United States Senate ratified it by a vote of 85 to 1. In recommending ratification of the treaty, the Senate Committee on Foreign Relations submitted a report explaining (1) that the right of self defence was not impaired, (2) that the Monroe Doctrine points to a possible menace against which this right of self defence might be exercised, and (3) that the treaty does not bind the United States to take forcible measures against a country that may be deemed to have disregarded it. Consult David Hunter Miller, *The Peace Pact of Paris* (New York, 1928).

**KELLY, GEORGE** (1887- ). An American dramatist, born at Philadelphia and trained

in private schools. He went on the stage in juvenile parts in New York in 1912 and later played in touring companies. For five years he appeared in one-act vaudeville features that he composed himself. He then produced a series of plays beginning with *Finders Keepers* and including *The Torch Bearers*; *The Show-Off*; *Craig's Wife* (Pulitzer Prize, 1925); and *Daisy Mayme*.

**KELLY, HOWARD ATWOOD** (1858- ). An American surgeon (see VOL. XIII). Since 1919 Dr. Kelley has been emeritus professor of gynecology at Johns Hopkins University and consulting gynecologist at the Johns Hopkins Hospital, Baltimore. He is the author (with W. L. Burrage) of *Dictionary of American Medical Biography* (1920, 1928) and he also wrote *A Scientific Man and the Bible* (1925); *Gynecology* (1928); and *Some American Medical Botanists* (1928).

**KELSO, JAMES ANDERSON** (1873- ). An American theologian, born at Rawal Pindi, India. He studied at Washington and Jefferson College, the Western Theological Seminary, and in Germany and was ordained to the Presbyterian ministry in 1898. In 1897 he was instructor in Hebrew at the Western Theological Seminary and was successively professor of Hebrew and Old Testament literature, acting president, and president of this institution (1908- ). He was lecturer at the American School of Research in Jerusalem, 1922-23. He wrote many books on theological subjects, including *A History of the Hebrews in Outline* (1921); and *A Hebrew Prophet and His Message* (1922).

**KEMAL PASHA**, kēm'āl pāshā, GHAZI MUSTAFA (1880- ). A Turkish Nationalist leader and President, who was born at Saloniki, and graduated from the military staff colleges in Constantinople with the rank of captain. A liberal, he founded the "Union and Progress Committee" which caused the downfall of Abdul Hamid and the proclamation of the constitution in 1908. At the outbreak of the World War, when he was military attaché in Sofia (1912-14), he opposed Turkish intervention, but fought brilliantly in Gallipoli, the Caucasus, and Syria. In 1920 he organized a rival government at Angora which gained control of Anatolia, and refused to accept the Treaty of Sévres, signed by the Sultan in Constantinople (later replaced by the more advantageous Treaty of Lausanne, 1923). By treaty with the Soviet Republics of the Caucasus, Kemal Pasha added a portion of Armenia to the Angora government, and by treaty with France, he regained Cilicia (1921). In September, 1922, by his signal defeat of the Greek Armies in Asia Minor, he became virtual master of Turkey, and in November the Sultan was dethroned. In August, 1923, Kemal was chosen president of the newly elected National Assembly, and in March, 1924, first president of the Turkish Republic, proclaimed Oct. 29, 1923. Measures of the National Assembly which were inspired by him were: the exchange of Turks from the Balkans for Christians from Turkey; the abolition of the Caliphate, and the resultant separation of church and state (1924); the abolition of the fez, of polygamy and the veil for women (1925 and 1926); the introduction of the new civil and penal law codes, based on those of Switzerland and Italy, respectively (1926); the census of 1927, and the substitution of the Roman alphabet for the Arabic (1928). Frequent attempts to assassinate Kemal were

made, the offenders being severely dealt with. In 1927 the newly elected National Assembly unanimously reelected him to another four-year term as President. See **TURKEY**, under *History*.

**KEMMERER, EDWIN WALTER** (1875- ). An American economist (see VOL. XIII). Retaining his professorship of economics and finance at Princeton, he also served as financial adviser to the Governments of Mexico (1917), Guatemala (1919), Colombia (1923), Union of South Africa (1925), Chile (1925), Poland (1926), Ecuador (1926-27), Bolivia (1927), and China (1929). In 1925 he was a member of the commission which formulated the Dawes Plan. His later works include: *Modern Currency Reforms* (1916); *The United States Postal Savings System* (1917); *Monetary System of Mexico* (1917); *The A B C of the Federal Reserve System* (1918); and *High Prices and Deflation* (1920).

**KEMP, HARRY HIBBARD** (1883- ). An American author, born in Youngstown, Ohio, and educated at the University of Kansas. He traveled all over North America in the guise of a tramp and made special studies of night life in London and New York. He wrote: *Judas*, a play (1910); *The Cry of Youth*, poems (1914); *The Thresher's Wife*, poems (1914); *The Passing God*, poems (1919); *John Gregory*, a novel (1922); *Tramping on Life*, a novel (1922); *The Sea and the Dunes*, poems (1926); *More Miles*, a novel (1927); *The Bronze Treasury* (anthology, 1927).

**KENDALL, EDWARD CALVIN** (1886- ). An American chemist born at South Norwalk, Conn., and educated at Columbia University. He was research chemist for Parke, Davis & Co., of Detroit, Mich., and also at St. Luke's Hospital, New York, 1911-14. In 1914 he became head of the section of chemistry at the Mayo Clinic in Rochester, Minn., and also professor of biochemistry at the University of Minnesota under the Mayo Foundation. His chief studies have been on the secretions of the human body, especially of the pancreas and the thyroid gland; his valuable researches have included the isolation of the active principles of the latter. For his work on thyroxin, he received the John Scott Prize of the city of Philadelphia in 1921 and the Chandler Medal of Columbia University in 1925.

**KENDALL, (WILLIAM) SERGEANT** (1869- ). An American figure painter (see VOL. XIII). Among his awards from 1914 to 1924 was a gold medal for painting, from the Panama-Pacific International Exposition in 1915. He was dean of the School of Fine Arts at Yale University, 1913-22. Among his later works may be mentioned *Crosslights* and *Intermezzo*.

**KENDRICK, JOHN BENJAMIN** (1857- ). A United States Senator, who was born in Cherokee County, Tex., and received a public-school education. Since 1885 he has been a cattle man in northern Wyoming and southern Montana, owning a large range ranch. He was a member of the Wyoming Senate (1910-14), Governor of Wyoming (1915-17), and U. S. Senator (Democrat) for three terms (1917-35).

**KENLY, WILLIAM LACY** (1864-1928). An American soldier, born at Baltimore, Md. He was graduated from the United States Military Academy in 1889, and was commissioned second lieutenant in the 4th Artillery. He served in Cuba in the Spanish-American War, and later in the Philippines. Before the United States

entered the World War, he had studied aviation, and although he landed in France in command of the 7th Field Artillery, he soon became chief of the air service, American Expeditionary Forces. He held the post from August, 1917, to November, 1917, and then, as brigadier general, was in command of the 2d Field Artillery Brigade, until Jan. 4, 1918. Ordered to the United States in March, 1918, he was appointed director of military aeronautics, with the rank of major general in the National Army. He served in this capacity until March, 1919, and in the following October, he was retired from active service. He was prominent in the organization of the Army Air Service Association in 1918 and was its first president. His war services were rewarded by the Distinguished Service Medal of the United States, a Commandership of the French Legion of Honor, the Order of the Bath of Great Britain, and the Italian Order of the Crown (Grand Officer). After his retirement from the Army, he was vice president of the Marland Oil Company.

**KENNEDY, DANIEL JOSEPH** (1862- ). An American clergyman and educator, born in Knox County, Tenn., and educated in schools in the United States and in Europe. He was ordained to the Roman Catholic priesthood in 1884. He filled chairs in the faculty of colleges in Europe and in 1906 became lecturer on sacramental theology at the Catholic University of America. From 1920 to 1923, he was professor of dogmatic theology at this university. His several books on theological subjects include *Saint Thomas and Medieval Philosophy* (1919).

**KENNEDY, MARGARET (MRS. DAVID DAVIES)** (1896- ). A British novelist who was educated at Cheltenham and Somerville College, Oxford. In 1922 shortly after her graduation from Somerville, she published *A Century of Revolution*, which was long used as a school history text. Up to this time, she had been writing fiction and destroying it all because it was not up to her standards. But in 1923 *The Ladies of Lyndon*, the first novel she thought worthy of preservation, was published, and in the next year *The Constant Nymph*. In 1926, with Basil Dean, she dramatized the novel, and it was a success also in this form. Other books were *Red Sky at Morning* (1927), and *Come With Me*, a play with Basil Dean (1928).

**KENOTRON.** This device, in the interval between 1914 and 1924, was developed from a scientific laboratory toy to a practical article of commerce. It will rectify small alternating currents (0.25 amperes) at 100,000 volts. Four of them have been arranged to rectify both half-cycles of 0.25 amperes at 200,000 volts. The kenotron consists of a hot cathode, platinum, tungsten, or impregnated tungsten, and a cold plate or anode in a high vacuum. The heated electrode emits electrons which are carried to the cathode by the correct potential, but as the cold electrode does not emit electrons there can be no current in the opposite direction. It is based on the Fleming valve. Variations and derivations of this type have been constructed to rectify currents as high as 1500 amperes. These tubes, however, have a small amount of gas in them. Consult a paper by Hull in *Trans. A. I. E. E.*, 1928.

**KENT, FRANK RICHARDSON** (1877- ). An American journalist. He was born at Baltimore, Md., was trained in public and private schools, and studied for a short time at Johns Hopkins

University. After an apprenticeship as reporter on the *Baltimore American*, he went to the *Baltimore Sun* in 1898 and was political reporter, Washington correspondent, and managing editor of that newspaper (1898-1921). Since 1921 he has been vice president. He is editor and owner of the *Maryland Almanac* and has written: *The Story of Maryland Politics* (1911); *The Great Game of Politics* (1923); *The Democratic Party: History* (1928); and *Political Behavior* (1928).

**KENT, NORTON ADAMS** (1873- ). An American physicist, born in New York City, and educated at Yale and Johns Hopkins Universities. During 1901-03 he was an assistant at the Yerkes Observatory and then held the chair of physics (1903-06) at Wabash College. In 1906 he was called to Boston University, where in 1910 he became full professor. He had made original investigations of such subjects as electric sparks in liquids and in air at high pressure, the shift of spark lines due to changed conditions, vacuum tube discharge in magnetic field, and magnetic separation of lithium doublets, on all of which he has published the results of his studies.

**KENT, ROCKWELL** (1882- ). An American artist. He was born at Tarrytown Heights, N. Y. His art studies were followed at Columbia University, and under Chase, Henri, Hayes Miller, and Thayer. He first attracted attention in 1907 with his pictures of Maine, such as *Winter* and *Seiners*, realistic marines notable for their strength of outline and massing of color. In 1913 he visited Newfoundland and brought back works which included the imaginative *House of Dread*, *A Newfoundland Dirge*, and *The Voyage Beyond Life*, pervaded by a dark atmosphere of mystery. Thereafter, during a sojourn in Alaska in 1918, he produced work of a symbolic and spiritual quality which was highly reminiscent of Blake. Among these decorative, clean-lined drawings, the *Mad Hermit* series was particularly noteworthy. His trip to Tierra del Fuego in a lifeboat in 1922 was also productive of mystical impressions. His work is represented in the Metropolitan Museum, New York, the Art Institute of Chicago, and other museums. He was the author of *Wilderness* (1920); and *Voyaging* (1924), and was editor of *Creative Art*.

**KENTUCKY.** The thirty-sixth State in size (40,598 square miles) and the fifteenth in population; capital, Frankfort. The population increased from 2,289,905 in 1910 to 2,416,630 in 1920, a gain of 5.5 per cent; estimated population, 1928, 2,553,000. The white population rose from 2,027,951 (1910) to 2,180,560 (1920); the native-white, from 1,987,898 to 2,149,780. The number of foreign-born whites fell off from 40,053 to 30,780; that of Negroes, from 261,656 to 235,938. The urban population increased from 555,442 to 633,543 and the rural from 1,734,403 to 1,783,087. The growth of the principal cities was as follows: Louisville (q.v.), 1910, 223,928 and 1920, 234,891; Covington, 53,270 to 57,121; Lexington, 35,099 to 41,534. Newport fell from 30,309 to 29,317.

**Agriculture.** The number of farms decreased 4.5 per cent, or from 270,626 in 1920 to 258,524 in 1925; the acreage in farms decreased from 21,612,772 to 19,913,104, or by 7.9 per cent. The improved land in farms embraced 13,975,746 acres in 1920. Crop land acreage was 6,827,313 in 1925. The total value of farm

property showed an increase from \$773,797,880 in 1910 to \$1,511,901,077 in 1920, but declined to \$963,568,916 in 1925; the average value per farm being \$2986 in 1910, \$5587 in 1920, and \$3727 in 1925. In interpreting these values, the inflation of the currency incident to the War is to be taken into consideration. The total percentage of land used for agricultural purposes decreased from 86.3 in 1910 to 84 in 1920 and 77.4 in 1925. Of the total number of farms in 1925, 175,442 were operated by owners; 281, by managers; and 82,801, by tenants. The corresponding figures for 1910 are 170,332, by owners; 993, by managers; and 87,860, by tenants. White farmers in 1920 numbered 257,998, compared with 247,455 in 1910; colored farmers, 12,628, compared with 11,730. There was a decrease in the colored population which noticeably affected the farm-labor situation. Farms reported as under mortgage numbered 40,615 in 1920; 34,088 in 1925. The total number of cattle was 1,093,453 in 1920; 904,983 in 1925; dairy cows, 659,794 in 1920, numbered 387,592 in 1925; swine, 1,504,431 in 1920; 919,304 in 1925; sheep, 707,845 in 1920 and 695,962 in 1925. The estimated production of the principal farm crops in 1928 was as follows: Corn, 66,038,000 bushels; wheat, 920,000; oats, 7,930,000; potatoes, 5,985,000; sweet potatoes, 1,246,000; tobacco, 306,000,000 pounds; and hay, 1,725,000 tons. Comparative figures for 1913 are corn, 74,825,000 bushels; wheat, 9,860,000; oats, 3,168,000; potatoes, 2,450,000; and tobacco, 281,200,000 pounds.

**Mining.** Kentucky is an important producer of minerals. It ranked eighth in the value of these products in 1927. Its resources are limited almost entirely to nonmetallic minerals, since there is but little metal mining in the State; in the order of their value, they are coal, petroleum, clay products, and natural gas. The progress of the industry during the period from 1914 is indicated by comparative figures. The coal production in 1914 was 20,382,763 net tons, valued at \$20,852,463; 1916, 25,393,997, \$30,193,047; 1917, 27,807,971, \$60,297,653; 1918, 31,612,617, \$80,666,042; 1920, 35,690,762, \$146,576,000; 1921, 31,588,270, \$55,092,600; 1926, 62,924,462, \$109,740,000; 1927, 69,123,998, \$119,240,000. The increased value of production in the War years was largely due to the decreased purchasing power of money and the consequent higher prices received for commodities. The output of petroleum has varied in recent years from 502,441 barrels in 1914 to 3,088,160 barrels in 1917; 4,367,968 in 1918; 8,738,000 in 1920; 9,012,600 in 1921; 8,973,200 in 1922; 6,274,000 in 1926; 6,719,000 in 1927; and 7,359,000 in 1928. In addition to the minerals mentioned, the State produced in 1926, 10,410,000 M feet of natural gas; also gasoline, sand and gravel, and stone. The total value of the mineral products was \$152,614,177 in 1927; \$146,708,273 in 1926; \$195,920,036 in 1920; \$110,305,840 in 1919; \$104,165,945 in 1918; and \$26,668,474 in 1914.

**Manufactures.** The census of 1920 reported eight cities of more than 10,000 inhabitants, the combined populations of which were 17.9 per cent of the total for the State. In 1919 these cities reported 72.7 per cent of the value of the State's manufactured products. In 1909 there were in the State 4776 manufacturing establishments; in 1919, 3057; in 1925, 1860; and in 1927, 1851. Persons engaged in manufactures in those years numbered 79,060, 83,954, 76,562;

and 74,912, respectively. Capital invested amounted to \$172,778,805 in 1909 and \$270,535,395 in 1919. A great increase in the value of products occurred prior to 1920. It was due chiefly to the change in industrial conditions brought about by the War. Yearly values of factory products were: 1914, \$230,249,000; 1919, \$395,660,000; 1925, \$453,731,042; and 1927, \$447,764,061. Flour-mill and gristmill products are important in point of value, with \$22,365,000 in 1909; \$45,774,000 in 1919; and \$29,940,276 in 1925. The lumber and timber industry is extensive, amounting in 1909 to \$21,381,000; 1919, \$34,456,000; 1925, \$12,579,228; 1927, \$12,201,912. The construction and repair industry ranks high, with products in 1909 worth \$6,535,000; 1914, \$13,344,000; 1919, \$30,598,000. In 1926 tobacco manufactures produced 85,172,000 cigars, 459,060,000 cigarettes, and 38,112,000 pounds of tobacco and snuff. The value of tobacco products in 1927 exclusive of cigars and cigarettes which were \$8,886,409 was \$20,047,231. The chief manufacturing cities of the State are Louisville, Covington, and Newport. In Louisville, in 1909, there were 903 establishments with products valued at \$101,284,000; in 1919, 767, with \$204,566,000; in 1925, products valued at \$263,693,000. In Covington in 1909 there were 196, with \$8,712,000; in 1914, 161, with \$8,265,000; and in 1919, 133, with \$17,121,000. In 1909 Newport had 144 manufacturing establishments with products valued at \$6,491,000; 1914, 100, with \$8,306,000; 1919, 81, with \$16,935,000.

**Education.** The educational problems of Kentucky are unusually difficult because of the isolation of many of its communities and the difficulty of administering to their needs through schools. Much progress has been made toward surmounting this difficulty. In 1919 a measure created a survey commission, providing for a State educational survey. The services of experts under the employ of the General Education Board were secured and more than 18 months were spent in making the survey. The General Assembly in 1920 enacted laws increasing the salaries of teachers and county superintendents and providing means by which money could be obtained, a compulsory-education law, and a law providing for health education in schools. The most important of all, was the county school administration law, creating county boards of education to fix the rate of the school levy and to appoint a county superintendent. In 1918 the minimum salary for teachers was made \$45 a month, and in 1920 this was increased to \$75 a month. In 1916 there were 149 high schools with an enrollment of 18,850; in 1925-26, 707 secondary schools, with an enrollment of 45,486. The junior high-school movement made progress. Enrollment in the schools has steadily increased. The total enrollment in the schools in 1914 was 517,290; in 1925-26 it was 575,482. Expenditures for schools were \$13,615,133 in 1921; in 1925-26 they were: current, \$15,641,089; outlays, \$1,958,274. The percentage of illiterates decreased from 14.5 in 1910 to 10.6 in 1920: among the native white population, from 12.3 to 9.2; among the foreign-born whites, from 8.2 to 7.5; among the Negroes, from 34.7 to 26.4.

**Finance.** State expenditures in the year ended June 30, 1927, as reported by the U. S. Department of Commerce, were: for maintenance and operation of governmental departments, \$17,971,261 (of which \$5,421,646 was aid to local

education); for interest on debt, \$618,388; for permanent improvements, \$11,143,001; total, \$29,732,590 (of which \$11,116,658 was for highways, \$2,599,000 being for maintenance and \$9,517,658 for construction). Revenues were \$30,719,702. Of this, property and special taxes formed 36.8 per cent; departmental earnings and charges for officials' services, 7.5 per cent; sales of licenses and the tax on gasoline, 39.5 per cent. Property valuation was \$2,923,088,336; State taxation thereon, \$10,193,642. Net funded State debt on June 30, 1927, was \$2,503,153.

**Political and Other Events.** Republicans made gains in certain recent election years. In 1914 two United States Senators were elected; they were J. N. Camden, elected to fill out the term of Senator Bradley, and J. C. W. Beckham, both Democrats. In 1915, when A. O. Stanley was elected governor, the Democrats retained all the offices except that of Secretary of State. In 1916 the Republicans made a strong effort to carry the State. In the presidential voting of this year, President Wilson received 269,990 votes; Charles E. Hughes, 241,854. On Sept. 4, 1916, the Lincoln Memorial at Hodgenville, built over the log-cabin birthplace of Abraham Lincoln, was formally presented to the nation by the Lincoln Farm Association; the speech of acceptance was delivered by President Wilson. On Nov. 5, 1917, the United States Supreme Court declared unconstitutional a race segregation ordinance passed by the city of Louisville in 1914. In 1918 Gov. A. O. Stanley, Democrat, was elected United States Senator. In 1919 the Republicans elected their candidate for Governor, E. P. Morrow. In 1920 the Republicans were again successful, electing R. P. Ernst, Senator; for President, J. M. Cox received 456,497 votes; W. G. Harding, 452,480. In 1923 the Democrats elected as governor William J. Fields. The presidential vote of 1924 was: Coolidge, 398,966; Davis, 374,855; LaFollette, 38,465. Flem D. Sampson, Republican, ran for governor in 1927, proposing that the State supply free textbooks, and was elected, though other State offices went to Democrats. Movements made progress, in 1927 and after, for the preservation of Mammoth Cave and Cumberland Falls. The vote for President in 1928 was: Hoover, 558,064; Smith, 381,070.

**Legislation.** The Legislature of Kentucky meets biennially, in even years. The Legislature of 1916 created the Workmen's Compensation Board, and passed several important laws relating to the regulation of the liquor traffic. In 1917 a modern tax was enacted. The Legislature in 1918 provided for a State bar examination. In 1919, State-wide prohibition was adopted. In 1920 the child-labor laws were amended, a State department of roads and highways was created, a prohibition-enforcement act was passed, a measure providing for the suppression of mob violence and the prevention of lynching was enacted, the State school system was modernized, a Department of Charities and Correction was created, the election laws were amended, and provisions were made for a State tuberculosis sanatorium. In 1922 a State coöperative marketing act was passed. In 1924 the Legislature passed a law requiring daily readings from the Bible in the public schools, restored the forestry department, and created a State park commission. In 1928 was enacted a law for purchase of school textbooks at State expense. A five-cent gasoline tax was rendered permanent, and a State judicial council was created.

**KENTUCKY, UNIVERSITY OF.** A State institution for the higher education of men and women at Lexington, founded in 1858. The enrollment increased from 1245 in 1914 to 2456 in the autumn of 1928, with an additional 1309 in the summer session of that year. The faculty increased from 75 to 237 members, and the library from 30,000 to 85,757 volumes. During the same period, the income increased from \$400,000 to \$1,304,573. The courses in economics, sociology, botany, zoölogy, music, art, and agriculture, were enlarged; courses in public health and hygiene were established; a college of education was created in 1923; and following upon changes in curriculum and faculty organization in 1925, Prof. Edward Wiest, formerly head of the department of economics and sociology in the arts and science college, became dean of the school of commerce, organized in that year. Art and chemistry buildings were constructed, also a new residence hall for women; additions to the plant in the following year consisted of a stock-judging pavilion, a new theatre, and an engineering shop. A gift of 15,000 acres from the E. O. Mountain Fund in 1923 provided opportunity for experiment in re-forestation, horticulture, farming, and stock-raising in the mountains of eastern Kentucky. The University in 1928 comprised seven colleges: Arts and sciences; agriculture; engineering; law; education; commerce; and the graduate school. Frank Le Round McVey, Ph.D., LL.D., succeeded Henry Stites Barker, LL.D., as president in 1917.

**KENWORTHY, JOSEPH MONTAGUE** (1886- ). A British sailor and member of Parliament, who was trained at the Royal Naval Academy. He entered the British Navy in 1902 and retired in 1920 with the rank of commander, after having served throughout the World War. Elected to Parliament from Central Hull as a Liberal in 1919, he joined the Labor Party in 1926 but retained his seat. He is the author of *Will Civilization Crash?* (1927); and *Freedom of the Seas*, with George Young, (1928).

**KENYA, KĀN'Ē-A, COLONY AND PROTECTORATE.** A British Crown colony in Africa, formerly known as the East Africa Protectorate, but after July, 1920, as the Kenya Colony. The protectorate is a strip of territory along the coastline 10 miles broad, leased from the Sultan of Zanzibar. The area is about 225,100 square miles; the population, in 1926, was estimated at 2,730,517, of whom 12,529 were Europeans, 30,583 Indians, and 10,557 Arabs. The largest city, Mombasa, had a population of 39,824 in 1926; the capital, Nairobi, 32,464. Most of the highland area suitable for white settlers was preempted by 1921. The land was being sown in maize and coffee in increasing quantities, while livestock breeding, dairying, etc., were coming in for more and more attention. The colony continues to prosper; imports and exports increased steadily from 1914 on, except for a passing setback in 1919-20. In 1913-14, imports were valued at £2,147,937; in 1920-21, they were £6,911,858; in 1927 £7,697,180. In 1913-14 exports were £1,482,876, while in 1920-21 they were £5,000,920, and in 1927 £5,397,216. Shipping increased somewhat, or from 3,565,795 tons entered and cleared in 1913-14 to 3,615,935 tons in 1927. Leading exports were hides and skins, grain, copra, coffee, and fibre. Revenues and expenditures mounted after 1914. In 1913-14 revenues were £1,133,708 and expenditures; £1,115,899; in 1922, £1,649,032 and £1,-



972,212; in 1927, £2,846,110 and £2,515,115. The State railway, by 1928, had been increased to 1109 miles. The annual railway surplus, beginning with 1920, was devoted to the railway construction fund. In connection with the trade figures above, it should be noted that in 1917 Uganda and Kenya were united in a customs union. See UGANDA.

**History.** In 1920 this protectorate, formerly known as the East Africa Protectorate, was changed to a Crown colony with the name Kenya Colony and placed under the British Colonial Office. The year before, in July, 1919, a measure of self-government was granted the territory when Europeans were permitted to elect 11 members to the Legislative Council; Indians were to be represented by two nominated members, and Arabs by one. The Government maintained its ascendancy by reserving the right to nominate enough members of the council to assure its control. Kenya became the storm centre of a famous controversy, reverberations of which soon were to be heard all over the British Empire. From 1896 on, Indians had come to the country in increasing numbers in the rôle of money lenders, traders, and artisans, so that after the World War there were 22,822 of them to 9501 Europeans. The restrictions placed on them by the whites were onerous. In particular, Indians in Kenya objected to the reservation of the Highlands for Europeans; commercial and residential segregation in the towns; the limited franchise; and restrictions on Indian immigration. The Indian position derived strength from the significant resolution passed by the 1921 Imperial Conference, favoring citizenship for Indians in the Empire. The question was whether the Indians were to be recognized as citizens of the Empire or as a subject race. Disagreement, continuing until 1923, became daily more bitter. A programme of 1923 which included a further extension of the franchise for Indians, based on a white majority of seven to four, and the abandonment of segregation and embargo on immigration, pleased neither side. The danger of open violence now spurred the British government to action. A conference was called, and the Colonial Office decided to compromise by establishing the principle of an Imperial trusteeship, based on neither European nor Indian self-government. The settlement, as finally effected, called for a communal franchise with five elected Indians and 11 Europeans, though with the official majority retained; the continuance of immigration regulations then in existence; the reservation of the Highlands for Europeans; the abolition of all segregation.

A new constitution was adopted in December, 1925, under which the executive council consists of eleven members in addition to the governor, while the legislative council consists of eleven elected European members, five elected Indian members, one member nominated to represent African interests, one elected Arab member, and a sufficient number of *ex-officio* and nominated official members to give these a majority. A treaty signed between Great Britain and Italy in July, 1924, resulted in the transfer, in June, 1925, of the Juba River and a strip 50 to 100 miles wide on the British side of the river. During 1926 and 1927 a commission investigated the boundaries of the ceded territory.

**KENYON, SIR FREDERIC GEORGE** (1863- ). An English classical scholar and archæ-

ologist (see Vol. XIII). He was president of the British Academy (1917-21), professor of ancient history in the Royal Academy (1918), and president of the Society for the Promotion of Hellenic Studies (1919-24), the Bibliographical Society (1924-26), and the Union Académique Internationale (1928). In 1925 he was knighted and made warden of Winchester College and in 1927 he was Romanes lecturer at Oxford. During the World War, he served in France as a lieutenant colonel in the Territorial Force. He was the author of *Ancient Books and Modern Discoveries* (1928).

**KENYON, WILLIAM SQUIRE** (1860- ). An American jurist (see Vol. XIII). He was elected United States Senator from Iowa in 1911 and, being successively reëlected, served until 1922, when he resigned following his appointment by President Harding as judge of the United States Circuit Court. While in the Senate, he was leader of the so-called "farm bloc" and was an aggressive supporter of progressive legislation. In May, 1920, President Hoover appointed him a member of the National Law Enforcement Commission.

**KENYON COLLEGE.** An institution at Gambier, Ohio, for men, founded by Philander Chase, first bishop of the Protestant Episcopal Church in Ohio, and incorporated in 1824. The corporation maintains two schools, an undergraduate college of letters and arts, and a divinity school. In the college, the student enrollment increased from 136 in 1914 to 253 in the autumn of 1928, the enrollment being limited to 250. The faculty increased from 14 to 24, and the library from 27,000 to 45,000 volumes. The endowment was increased from \$520,000 to \$1,024,000, the income in 1928 being \$208,000. A total of \$600,000 was added to the endowment fund in 1921. In 1923 a dormitory, designed to house 100 students, and to be known as Leonard Hall, in honor of the Bishop of Ohio, was under construction at a cost of \$200,000; a central heating plant was under construction at the same time. In 1926 the Samuel Mather Science Hall, a gift of Henry G. Dalton of Cleveland, Ohio, and costing \$350,000, was dedicated. President, William F. Peirce, L.H.D., D.D.

**KERENSKY, kër-énz'kë, ALEXANDER** (1881- ). A Russian Socialist leader, born in Siberia and graduated in law from the University of Petrograd, where he practiced for some years. He entered the Third Duma in 1912, was an impassioned and forceful speaker and became a leader in the Fourth Duma by 1917. After the overthrow of the Czar, Kerensky was Minister of Justice in the Lvov coalition ministry until May, when he became Minister of War. In July, he became premier. He attempted to reorganize the Russian Army and make it a potent factor again in the struggle against the Central Powers, but was hampered on every side by the activities of the Bolsheviks and disgruntled military leaders. In September, 1917, he was able to crush an abortive revolt led by General Kornilov, but by November, he was unable to withstand the Bolsheviks, who drove him from power. After his downfall, he visited many of the capitals of Europe, finally establishing an anti-Bolshevik newspaper in Paris. In 1928 he lectured in the United States on anti-Bolshevik propaganda. See RUSSIA, *History*.

**KERR, ALFRED** (1807- ). A German critic, born at Breslau. He edited the magazine *Pan*, and his published works include;

*Davidshändler: das Neue Drama* (1904); *Die Harfe* (1918); *Die Welt im Drama* (1918); *Die Welt im Licht* (1920); *Der Krämerspiegel*, a play with music by Richard Strauss, *New York and London* (1923); *O Spanien!* (1924); *Yankee-land* (1925); *Caprichos*, poems (1926); and a book of reminiscences and reflections, *Es sei wie es wolle, es war doch so schön* (1927).

**KERR, JAMES MANFORD** (1851- ). An American legist, born near Tippecanoe City, Ohio, and educated at the National Normal University, Lebanon, Ohio. He began to practice law in Ohio in 1877. He edited several law periodicals, founded the *American Law Journal*, and became editor for the Bender-Moss Company and the Bancroft-Whitney Company, law book publishers of San Francisco, Calif. His numerous writings include: *Before and at Trial* (1889); *Business Corporation* (1890); *Cyclopaedia California Civil Code*, 2 vols. (1905); *Cyclopaedia California Penal Code* (1906; 2d ed., 1921); *Cyclopaedia California Political Code* (1906; 2d ed., 1921); *Cyclopaedia California Code of Civil Procedure*, 2 vols. (1907; 2d ed., 1921-22); *Kerr's Wharton on Criminal Law*, 3 vols. (1912); *California Digest*, 10 vols. (1915-17); *Biennial Supplement* (1917); *Kerr's Wharton's Criminal Procedure with Forms*, 4 vols. (1918); *Kerr's Pleading and Practice under the Procedural Codes*, 2 vols. (1919); *Biennial Code Supplement* (1923).

**KERR, SOPHIE** (MRS SOPHIE KERR UNDERWOOD) (1880- ). An American novelist, born at Denton, Md. She was educated at Hood College, Frederick City, Md., and the University of Vermont. She began to write stories at 18 years of age and did newspaper work in Pittsburgh, Pa., for a few years, and then went to New York City, where she was managing editor of the *Woman's Home Companion*. She contributed stories to practically all the major magazines in the United States. Her novels include: *Love at Large* (1916); *The Blue Envelope* (1917); *The Golden Block* (1918); *The See-Saw* (1919); *Painted Meadows* (1920); *One Thing Is Certain* (1922); *Confetti* (1927).

**KESSEL, JOSEPH** (1898- ). A French writer, of Russian descent, whose best novel was *L'équipage* (1923). His other works include *Les rois aveugles*, with Hélène Iswolsky (1925); *Terre d'Amour* (1927); *Les cœurs purs* (1927); and *Nuits de Sibérie* (1928), short stories.

**KETTERING, CHARLES FRANKLIN** (1876- ). An American electrical engineer and inventor. He was born in Ashland County, Ohio, and after receiving technical training in Ohio State University (B.E. and M.E., 1904), joined the electrical department of the National Cash Register Company at Dayton, Ohio. In 1914 he organized the Dayton Metal Products Company and later became president and general manager of the General Motors Research Corporation and president of the Dayton Engineering Laboratories Company. He invented a starting, lighting, and ignition device for automobiles which came to be known as the "Delco." He also invented and put on the market the Delco light for farm houses. He was elected to the National Academy of Sciences in 1928.

**KEUTGEN, FRIEDRICH WILHELM E.** (1861- ). A German historian and professor of history at the University of Hamburg. He was born at Bremen and studied at Giessen, Göttingen, and Strassburg. He was lecturer at Johns Hopkins University in Baltimore in 1904-05, and

organized and became lecturer at the Kolonial Institut in Hamburg in 1910. He wrote *Die Hansa in England im Vierzehnten Jahrhundert* (1890); *Die Aufgabe der Genealogie* (1899); *Der Grosshandel im Mittelalter* (1902); *Handelsgeschichtliche Probleme* (1904); *Britische Reichsprobleme und der Krieg* (1914); *Entstehung des Britischen Weltreichs* (1915); *Das Britische Kolonialreich* (1915); and *Der Deutsche Staat des Mittelalters* (1918).

**KEY, PIERRE VAN RENSSELAER** (1872- ). An American editor, born at Grand Haven, Mich., and educated privately and at the Chicago Musical College. For several years, he was music critic on the staff of newspapers in Chicago, and from 1907 to 1919, he was music editor of the *New York World*. In the latter year, he founded and became editor of the *Musical Digest*. He contributed many articles on musical subjects to newspapers throughout the country, compiled the *Music Year Book*, 1926-27, and wrote biographies of McCormack and Caruso.

**KEYES, FREDERICK GEORGE** (1835- ). An American physical chemist, born at Kingston in Canada, and educated at Rhode Island College and Brown University. After teaching chemistry at Brown, he went to the Massachusetts Institute of Technology as research associate in physical chemistry in 1909. During 1913-16 he was chief engineer of the Cooper Hewitt Electric Company and then returned to the Institute of Technology, where in 1920 he became director of the research laboratory in physical chemistry and in 1922 head of the department of chemistry. His own researches have included equilibrium measurements, gas and liquid phase, thermodynamic properties of ammonia, and low temperature in connection with the kinetic theory of development, which he has published in technical journals. During the World War, he was director of the research and control laboratory of the Chemical Warfare Service at Puteaux, France. He is the author of *The Thermodynamic Properties of Ammonia* (1916).

**KEYNES, KÄNZ, JOHN MAYNARD** (1883- ). An English economist and publicist. He was educated at Eton and King's College, Cambridge, and then entered the civil service in the India Office (1906-08). He was on the Royal Commission on Indian Finance and Currency (1913-14), and in the Treasury (1915-19), acting as its principal representative at the Paris Peace Conference (1919), besides being the Chancellor of the Exchequer's deputy on the Supreme Economic Council. His work in Paris gave him world-wide distinction. He was among the first to protest against the rigorous provisions of the reparations clauses of the Versailles Treaty. He wrote *Economic Consequences of the Peace* (1919) and *A Revision of the Treaty* (1922). A chapter of the former contained the now famous attack on the visionary character of President Wilson's programme. His other writings include *Indian Currency and Finance* (1913); *A Treatise on Probability* (1921); *Money and Foreign Exchange* (1923); *A Short View of Russia* (1925); and *The End of Laissez-Faire* (1926). He was editor of the *Economic Journal* (1912- ), chairman of *The Nation* (1923- ), and secretary of the Royal Economic Society.

**KEYSER, CASSIUS JACKSON** (1862- ). An American mathematician and philosopher (see Vol. XIII). His works published after

1914 include *The Human Worth of Rigorous Thinking* (1916); *Mathematical Philosophy, a Study of Fate and Freedom* (1922); *Thinking about Thinking* (1926); *Mole Philosophy, and Other Essays* (1927).

**KEYSERLING**, KĪ'zēr-ling, HERMANN ALEXANDER, COUNT VON (1880- ). A leading German social philosopher, born at Kōnno in Livonia. His family came from the wealthy German-speaking nobility of Baltic Russia. After his education at the universities of Dorpat, Heidelberg, and Vienna, he took a trip around the world. He interested himself in natural science and in philosophy, and before the World War, he was known both as a student of geology and as a popular essayist. The Russian Revolution deprived him of his estate in the Baltic, and with the remains of his fortune, he founded the Gesellschaft für Freie Philosophie (Society for Free Philosophy) at Darmstadt. The mission of this school was to bring about the intellectual reorientation of Germany. Although not a doctrinaire pacifist, Keyserling believed that the old German policy of militarism was dead for all time and that Germany's only hope lay in the adoption of international, democratic principles. His political and social writings include: *Europas Zukunft* (1918); *Deutschlands Wahre Politische Mission* (1919); *Was Uns Not Tut und Was Ich Will* (1919); *Peace or War Everlasting* (1920); and *Politik, Wirtschaft, und Weisheit* (1922). His more speculative writings include: *Das Reisetagebuch einer Philosophen* (1919); *Philosophie als Kunst* (1920); *Weisheit und Sinn* (1922); *Schöpferische Erkenntnis* (1922, published in English in 1928 as *Oreative Understanding*); *Wiedergeburt* (1925); *Die neuentstehende Welt* (1925, in English trans., *The World in the Making* 1927), and *Menschen als Sinnbilder* (1926). He also compiled a symposium called in English, *The Book of Marriage* (1926).

**KIAOCHOW**. See SHANTUNG; JAPAN, under *History*.

**KIDNEY DISEASE**. See NEPHRITIS.

**KILLIAN**, GUSTAV (1860-1921). A German laryngologist, born in Mainz, and educated at the University of Freiburg-im-Breisgau. He made revolutionary advances in the diagnosis and treatment of affections of the infralaryngeal passages, especially in the diagnosis and removal of foreign bodies in the bronchial tubes, by means of his new art of bronchoscopic control. His first college appointment was as assistant to Professor Hack of the chair of otolaryngology in Mainz. The sudden death of Hack led to his succession by Killian. His revolutionary activity in bronchoscopy gained him an appointment as professor of laryngology in the University of Berlin; this was the first professorship of such scope in Germany. Killian introduced another innovation known as suspension laryngoscopy into the technic of his specialty. He wrote no monograph on the bronchoscope, and the omission has been supplied by his pupils. His book, *Die Schwebelaryngoskopie* appeared in 1920; in collaboration with Voss, he wrote a volume on military experience, *Gehörgan, Obere Luft, und Speisengänge* (1921). A Festschrift volume was published in 1920.

**KILMER**, JOYCE (1886-1918). An American journalist and poet, born in New Brunswick, N. J. Following his graduation from Rutgers College and studies at Columbia Uni-

versity, he taught for a time and then entered newspaper work in New York City. He contributed to many newspapers and magazines on many subjects, but he was chiefly distinguished for his verse and was recognized as one of the most prominent of the younger American poets. At the outbreak of the World War, he enlisted as a private in the 165th Infantry (69th New York), and in August, 1918, was killed in the course of the American advance which drove the Germans from the Marne salient. His books include *Summer and Love* (1911); *Trees and Other Poems* (1915); and *Main Street and Other Poems* (1915).

**KIMBALL**, (SIDNEY) FISKE (1888- ). An American architectural author, born at Newton, Mass., and educated at Harvard University and in Europe. He was assistant in Harvard and instructor at the University of Illinois from 1909 to 1913. In the latter year, he was appointed instructor in architecture at the University of Michigan and was later assistant professor of architecture and assistant professor of fine arts there. In 1919-23 he was professor of art and architecture at the University of Virginia, and since 1925 has been director of the Pennsylvania Museum and School of Industrial Art. He wrote much on architectural subjects and was an editor of *Art and Archaeology* (1916-23). He designed the McIntire Amphitheatre in West Virginia and many other buildings. He was engaged in the restoration of Monticello, the home of Jefferson, and of old mansions in Fairmount Park, Philadelphia. His writings include *Jefferson and the First Monument of the Classical Revival* (1915); *Thomas Jefferson, Architect* (1916); *A History of Architecture*, with G. H. Edgell (1918); *Domestic Architecture of the American Colonies* (1922); and *American Architecture* (1928).

**KINDERGARTEN ASSOCIATION**, NATIONAL. The Association's work of providing kindergarten training for all children has kept approximately even with the increase in population. In 1929, as in 1924, about 4,000,000 children were not provided for. The number of kindergartens, however, increased from 502, located in 322 towns, and training 209,734 children in 1923, to 962 kindergartens, located in 592 towns, and training 357,100 children in 1928. In order to convince the public of the value of early schooling, the association has secured the coöperation of such organizations as the Parent-Teacher Association, and the Federation of Women's Clubs, in advertising through pamphlets and charts. Continuing the practice started in 1917, it sent by request, with the aid of the U. S. Bureau of Education, articles on home education to 1341 periodicals in the United States and 46 other countries. By 1929 laws facilitating the establishment of kindergartens were passed, on the investigation of the association, in 14 States. Headquarters of the National Kindergarten Association are at 8 West 40th Street, New York City.

**KINDERGARTENS**. See EDUCATION IN THE UNITED STATES.

**KING**, (WILLIAM BENJAMIN) BASIL (1850-1928). An American author (see Vol. XIII). His later books are *The Side of the Angels* (1916); *The High Heart* (1917); *The Lifted Veil* (1917); *The City of Comrades* (1919); *The Abolishing of Death* (1919); *The Thread of Flame* (1920); *The Empty Sack* (1921); *The Conquest of Fear* (1921); *The Dust Flower*

(1922); *The Discovery of God* (1923); *The Happy Isles* (1923); *The High Forfeit* (1925); *Faith and Success* (1925); and *The Spreading Dawn* (1927). In his later years, he paid much attention to the hypothesis of the survival of life after bodily death; he embodied his theories in some of his stories in a motion picture, *Earthbound*.

**KING, RT. HON. WILLIAM LYON MACKENZIE** (1874- ). A Canadian public official, who was Prime Minister, President of the Privy Council, and Secretary of State for External Affairs (1921-26, and 1926- ) (see VOL. XIII). During the World War, he was active in adjusting the relations between workers and employers, at the same time investigating these relations for the Rockefeller Foundation (1914-17). In 1919 the National Liberal Convention chose him to succeed Sir Wilfred Laurier as leader of the Liberal Party, and he was reelected to the Canadian Parliament in the same year. On Dec. 29, 1921, he took office with his new Liberal government. He was made a member of the Privy Council in 1922, and received honorary degrees from Queen's, Toronto, Harvard, Edinburgh, Yale, and Oxford. He represented Canada at the Imperial Conference in London in 1923, at the same time receiving the Freedom of that city and Sheffield. He wrote *Industry and Humanity—A Study of the Principles Underlying Industrial Reconstruction* (1918).

**KINKELDEY, OTTO** (1878- ). An American musicologist, born in New York. After studying music at Columbia University under MacDowell (1900-02), he went to Berlin, where he took various courses in musicology at the University, under Kretzschmar, Friedländer, Wolf and Stumpf, at the same time continuing the study of the organ under Egidi and filling the position as organist at the American Church (1902-05). Having received the degree of Ph.D. with his dissertation *Orgel und Klavier in der Musik des 16. Jahrhunderts*, he was appointed, in 1909, teacher of organ and theory and librarian at the Institut für Kirchenmusik in Breslau. In 1910 he became dozent of musicology at the University there, and before the end of the year was advanced to the rank of professor. He resigned in 1914 and returned to New York, where, in 1915, he was appointed Chief of the Music Division of the New York Public Library. During 1923-27 he was professor of music at Cornell University, and then returned to his former post at the New York Public Library. He edited Erlebach's *Harmonische Freude* for the *Denkmäler deutscher Tonkunst* (vols. 46-47).

**KINSMAN, FREDERICK JOSEPH** (1868- ). An American clergyman and writer, educated at St. Paul's School at Concord, N. H., and at Keble College, Oxford. He was Protestant Episcopal Bishop of Delaware from 1908 to 1919, but resigned to become a Roman Catholic and was appointed professor of modern church history in the Catholic University at Washington. He wrote: *Principles of Anglicanism* (1910); *Prayers for the Dead* (1914); *Issues before the Church* (1915); *Outlines of the History of the Church* (1916); *Catholic and Protestant* (1918); *Salve Mater* (1920); *Americanism and Catholicism* (1924).

**KIPLING, (JOSEPH) RUDYARD** (1865- ). An English novelist and poet (see VOL. XIII). He was Rector of the University of St. Andrews (1922-25), Doctor of Philosophy at Athens

(1924), and received the gold medal of the Royal Society of Literature (1926). During the World War, in which his only son was killed, he wrote much on subjects connected with the British Army and nation. His writings include *New Armies in Training* (1914); *Sea Warfare* (1916); *A Diversity of Creatures* (1917); *The Years Between* (1918); *Inclusive Verse* (1919 and 1927); *Letters of Travel* (1920); *The Irish Guards in the Great War* (2 vols., 1923); *Land and Sea Tales for Scouts and Guides* (1923); *Debits and Credits* (1926); and *A Book of Words*, containing the first collection of Kipling's speeches and addresses, his views on modern materialism, art, international relations, dreams, etc. (1928).

**KIRBY, ROLLIN** (1874- ). An American cartoonist. He was born at Galva, Ill., and had a public-school training. He became a magazine illustrator in New York (1901-10) and then contributed cartoons, both social and political, to the *New York Mail* (1911), the *Sun* (1912), and the *World* (1913). Since 1914 he has been political cartoonist of the *New York World*. He was awarded the Pulitzer Prize of \$500 for cartoons in 1921 and 1924. In addition to being a cartoonist, he is a writer of verse, articles, and sketches.

**KIRCHSEISEN, KIRK'Ũ-ZĒN, FRIEDRICH MAX** (1877- ). A German historian, born at Chemnitz. He studied history and international law at the Universities of Leipzig and Paris, specialized in the Napoleonic era, and became known also for his geographical and literary researches. His writings include a bibliography on Napoleon which was published in German, English, and French (1902); *Die Schriften von und über Friedrich von Gents* (1906); *Napoleon: Auswahl aus Seinen Aussprüchen* (1907); *Napoleon, Sein Leben und Seine Zeit* (1914); *Der Völkerring* (1915-17); *Die Schlacht an der Marne* (1915); *Lord Nelson* (1926); *Die Bastille* (1927); *Memoiren Napoleons* (1927); *Die grosse französische Revolution* (1928).

**KIRCHWEY, GEORGE W. (WASHINGTON)** (1855- ). An American legal scholar (see VOL. XIII). In 1915-16 he served as warden of Sing Sing Prison and after 1917 was head of the Department of Criminology of the New York School of Social Work. He resigned as Kent professor of law at Columbia in 1916. He served on various committees investigating prisons and in 1918-19 was director of the United States Employment Service.

**KIRGHIZ AUTONOMOUS SOCIALIST SOVIET REPUBLIC.** See SIBERIA.

**KISTEMAECKERS, HENRY (HUBERT ALEX-ANDRE)** (1872- ). A Franco-Belgian writer born at Floreffe and educated at the Athénée Royal and the University of Brussels. He was best known for his plays, which include *Pierrot amoureux* (1890); *Accroche-Cœurs* (1893); *Le premier client* (1903); *L'Instinct* (1905); *Le Marchand de bonheur*, taken from his novel of the same name (1910); *La Flamée* (1912); *L'Emboscade* (1913); *L'Épilée* (1913); *Un Noir, au front . . .* (1918); *Le Roi des palais* (1920); *La Passante* (1921); *En Bombel ou Un mari s'est échappé* (1923); and *L'Amour* (1924). His novels include *L'évolution sentimentale*, a trilogy (1892-98); *Confidences de femmes* (1894); *Les Heures suprêmes* (1897); *Le Frisson du passé* (1900); *L'apprentissage de Lord Will* (1904); *Will, Trim et Cie* (1906); and *Lord Will, aviateur* (1909).

**KITCHENER**, kich'en-ēr, HORATIO HERBERT, first EARL OF (KITCHENER OF KHARTUM) (1850-1916). A British soldier and administrator (see Vol. XIII). When England entered the World War, Kitchener was at home on leave from Egypt and was appointed Secretary of State for War. He built up an army of over 2,000,000 men. Having undertaken to help in the reorganization of the Russian forces, he sailed from Scapa Flow, on the British warship *Hampshire*, on June 5, 1916, to consult with the Czar. His ship struck a German mine off the Orkneys, and he and most of his staff were drowned. Consult: *Kitchener in his own Words*, by J. B. Rye and Horace J. Grosser (1917); *The Life of Lord Kitchener*, by Sir George Arthur, Kitchener's private secretary 1914-16 (1920); *The Tragedy of Lord Kitchener*, by Reginald, Viscount Esler (1921); and *The Truth about Kitchener*, by Victor Wallace Germain (1925).

**KITTREDGE**, GEORGE LYMAN (1860- ). An American philologist (see Vol. XIII). He has been professor at Harvard for many years and is a very prolific author. In 1924 he received an honorary Litt.D. from Yale University. His later works include: *Chaucer and His Poetry* (1915); *Gawain and the Green Knight* (1916); *Shakespeare* (1916); *Concise English Grammar*, with F. E. Farley (1918); *Dr. Robert Child, the Remonstrant* (1919); *Sir Thomas Mallory* (1925); *Witchcraft in Old New England* (1928).

**KLAGENFURT**, klä'g'en-fört', **BASIN**. This region on the southern boundary of the Austrian Republic in the basin of the Drave, with an area about 1200 square miles, was one of the districts most stubbornly contested in the making of the peace after the World War. Although the whole region is a political and economic unit, since the Valley of the Drave, enclosed by highlands, here widens out into a long corridor, its disposition nevertheless presented a peculiar problem, for the northern side of the valley was peopled by German Austrians and the southern, by Slovenes. Its total population was about 150,000, the majority Slovenes but of no pronounced Slavophil sympathies; Klagenfurt, the town, had 28,958 inhabitants (1910), 25,582 of whom were Germans. The failure of the Austrian armistice terms to fix an occupation line for the province of Carinthia, and the desire of the Yugoslavs to push their boundaries as far north as possible, made this region the scene of turmoil and bloodshed for more than six months after the actual close of war. This turn of affairs compelled the Peace Conference to take action. Articles 50 of the Treaty of St. Germain of Sept. 10, 1919, therefore made provision for the dividing of the basin into two zones, A and B. In the southern and larger zone (A), a plebiscite was to be held first, and the disposition of the whole region was then to be thus determined by the vote in this zone: in the event of a favorable Yugoslav vote, A was to go to Yugoslavia and a plebiscite was to be held in B; in the event of a favorable Austrian vote the whole was to go to Austria without further action. An inter-Allied commission took charge of Zone A on July 21, 1920, and on Oct. 10, 1920, the voting took place. In spite of the fears entertained by Austrians for the loss of the district because of the predominantly Slovene population, about 70 per cent, and the fact that Yugoslavs had administered the zone from September, 1919, the vote was in favor of Austria; 22,025

ballots were cast for the Republic and 15,279 for Yugoslavia. The Basin, therefore, reverted to Austria.

**KLEIBER**, ERICH (1890- ). An Austrian conductor, born in Vienna. After graduation from the Prague Conservatory, he began his career as assistant conductor at the Deutsches Landestheater there. In 1912-18 he was conductor at the Hoftheater in Darnstadt, and for the next two years in Barmen-Elberfeld, where his reputation as an operatic and concert conductor was such that he was called to Düsseldorf and then to Mannheim. In 1923 he became the general musical director of the Berlin Staatsoper.

**KLEIN**, JULIUS (1886- ). An American public official. He was born at San José, Calif., and graduated at the University of California. Later, he studied at the University of Berlin, the Sorbonne (Paris), and Harvard (Ph.D., 1915). He was an instructor and assistant professor at Harvard (1915-23), chief of the Latin-American Division of the U. S. Department of Commerce (1917-19), U. S. commercial attaché in Argentina (1919-20), and director of the U. S. Bureau of Foreign and Domestic Commerce (1921-29). He has been Assistant Secretary of Commerce since March, 1929. He is the author of *Mesta: a Study in Spanish Economic History* (1920).

**KLEMPERER**, OTTO (1885- ). A German conductor, born in Breslau. In 1901 he entered the Hoch Conservatory in Frankfurt, but completed his studies under Kwast and Pfitzner in Berlin. Upon Mahler's recommendation, he was appointed conductor at the Deutsches Landestheater in Prague, in 1907, and two years later became first conductor in Hamburg, whence he was called to Strassburg, and in 1917 to Cologne, where he was made general musical director in 1923. The next year he went in a similar capacity to Wiesbaden. In 1926 he was guest-conductor of the New York Symphony Orchestra, and after his return to Germany he accepted the post of conductor and general director of the Preussische Staatsoper in Berlin (there are three great opera houses in Berlin, the Städtische Oper [Charlottenburg], director Bruno Walter; the Staatsoper, Erich Kleiber; the Preussische Staatsoper, Klemperer).

**KLENAU**, PAUL AUGUST (1883- ). A distinguished Danish composer and conductor, born in Copenhagen. He began his musical studies there under Hilmer (violin) and Malling (composition), then continued in Berlin under Halir (violin) and Max Bruch (composition), and in 1904 went to Munich for further study of composition under Ludwig Thuille. In 1907 he became conductor in Freiburg, but the next year resigned and studied conducting with Max Schillings in Stuttgart. In 1914 he returned to Freiburg as first conductor. In 1920 he became conductor of the Philharmonic Society in Copenhagen and at the same time one of the conductors of the Vienna Konzertverein. His compositions comprise three symphonies; a symphonic poem, *Paolo und Francesca*, later expanded into three movements under the title, *Inferno-Pantasia*; a symphonic fantasy, *Jahrmarkt bei London*; a ballad for baritone and orchestra, *Hölle Skammelsen*; a choral work, *Die Weise von Liebe und Tod des Kornets Rilke*; *Gespräche mit dem Tod*, for contralto and orchestra; the operas *Sulamith* (Munich, 1913), *Klein Idas Blumen* (Stuttgart, 1916), *Kjartan und Gud-*



run (Mannheim, 1918; rewritten as *Gudrun auf Island*, Hagen, 1924); and *Die Lästerschule* (Frankfort, 1927).

**KLIMKE, FRIEDRICH A.** (1878-1924). An Austrian Jesuit. He was born at Golleow and studied classical philology at the university of Cracow. He became professor of philosophy and of the history of philosophy at the Universities of Cracow and Innsbruck and in 1920 was called to the Gregorian University in Rome. His writings include: *Der Deutsche Materialismusstreit im Neunzehnten Jahrhundert* (1907); *Der Mensch* (1908); *Hauptprobleme der Weltanschauung* (1910); *Der Monismus und Seine Philosophischen Grundlagen* (1911); *Monistische Einheitsbestrebungen in der Katholischen Weltanschauung* (1912); *Monismus und Pädagogik* (1918); *Unsere Sehnsucht* (1922).

**KLIMSCH, FRITZ** (1870- ). A German sculptor who was born in Frankfort, and studied at the academies of Frankfort and Berlin. Among his best works are *Salome*, in a private gallery in Berlin; the *Niobid* in Leipsic; a *Dancer* and the *Virchow* monument in Berlin, and a bust of Max Liebermann.

**KLOTZ, OTTO JULIUS** (1852-1924). A Canadian civil engineer and astronomer (see Vol. XIII). He was director of the Dominion Observatory at Ottawa (1916-24), chairman of the National Committee of Canada of the International Astronomical Union in 1920, and president of the American Seismological Society during 1920-21.

**KLUCK, KLUK, ALEXANDER VON** (1846- ). A German general (see Vol. XIII). He led the campaign of the Marne in 1914, was wounded in 1915, and retired in the following year. General von Kluck wrote of his participation in the World War in the volume entitled *Führung und Taten der Erste Armee* (1920).

**KNAPP, BRADFORD** (1870- ). An American agricultural educator, born at Vinton, Iowa, and educated at Vanderbilt University and in law at the University of Michigan. For several years he practiced law in Iowa and until 1911 was engaged in cooperative demonstration work for the Bureau of Plant Industry. In 1911 he was appointed special agent in this bureau and from 1915 to 1920 was chief of extension work in the South for the States Relations Service of the United States Department of Agriculture. In 1920-23 he was dean of the College of Agriculture of the University of Arkansas and director of the State Experiment Station. Since 1923 he has been president of the Oklahoma Agricultural and Mechanical College. Professor Knapp wrote *Safe Farming; How the Whole Country Demonstrated*; and publications for the United States Department of Agriculture.

**KNEISEL QUARTET.** See Music, under *Chamber Music*.

**KNIGHTS OF COLUMBUS.** A Roman Catholic fraternal and benevolent society founded in 1882. In addition to the Supreme Council and the board of directors, there were, on June 30, 1929, 61 State councils and two territorial jurisdictions; and in the 2544 subordinate councils, the insurance members numbered 247,040, and the associate members 390,083.

Carrying out its notable World War relief, the Knights of Columbus opened, in 1919, free evening courses to ex-service men in academic, commercial, trade, and technical subjects. As the number of schools increased, correspondence and home study courses were instituted in 1921,

and in 1923 this opportunity was extended to all members of the Order. In accordance with a plan evolved in 1922, the Knights of Columbus devoted much of their resources to work among boys, and in June, 1926, the first class was graduated from the two-year Boy Guidance course at Notre Dame University. A programme and ritual for a junior order, the Columbian Squires, was accepted in 1925, and further development the following year; the Circles of Squires increased steadily through 1929.

The Supreme Council, in August, 1926, authorized the directors of the Knights of Columbus to assess its members to the extent of \$1,000,000 to finance an educational campaign against the policies of Soviet Russia, particularly against such Bolshevistic activities as were exhibited by the Mexican régime. To this end, approximately 4,000,000 pamphlets on the Mexican situation were distributed through 1928, and numerous lectures delivered throughout the United States.

Benevolence outside the United States included the gift of \$25,000 to aid those suffering from the earthquake in Japan in 1925. In the same year, managers of the society's \$1,000,000 endowment fund for welfare work in Italy completed the fifth large playground erected by the Order in that country. The Knights of Columbus publishes the *Columbia*, a monthly magazine of general character, which had a circulation exceeding 700,000 in 1928. The headquarters of the Supreme Council are located at New Haven, Conn., and in 1928 Martin H. Carmody was the supreme knight; William J. McGinley, the secretary; and D. J. Callahan, the treasurer.

**KNIT GOODS.** See TEXTILE MANUFACTURING.

**KNOX, PHILANDER CHASE** (1853-1921). An American lawyer and statesman (see Vol. XIII). He was reelected to the Senate in 1916 for the term ending 1923. He took a prominent part in debates on the Versailles Treaty and the Covenant of the League of Nations and was the author of the Knox Resolutions, which proposed the repeal of the joint resolution of Apr. 6, 1917, declaring the existence of a state of war with Germany, and in its place the declaration that the state of war was at an end, on the condition that the United States should have possession of the property of the German government in the United States, and of its subjects, until a treaty should be ratified. This resolution was defeated. Senator Knox was one of the chief opponents of the Versailles peace treaty in the Senate.

**KNOX COLLEGE.** A coeducational institution at Galesburg, Ill., founded in 1837. The student enrollment increased from 340 in 1913-14 to 664 in 1927-28, the faculty was increased from 26 to 42 members, and the library from 10,000 to 50,000 volumes. The productive funds were increased in the same period from \$402,601 to \$1,750,000, and the yearly income from \$53,851 to \$210,000. Lyman Kay Seymour Hall, a men's dormitory, union, and commons, costing \$150,000, was erected in 1921; the Henry M. Seymour Library was finished in 1928, completely equipped in every detail. The college had adopted a policy of owning all fraternity houses, which are leased for a long term to the fraternities; two new fraternity houses were built; and three large residences were made over for fraternity purposes. President, Albert Britt, A.B., Litt.D.

**KODÁLY, ZOLTÁN** (1882– ). A prominent Hungarian composer, born in Kecskemét. He received his musical education at the Hochschule in Budapest, where he has been a teacher of theory and composition since 1907. From the beginning, he was fascinated by the Hungarian folk-songs, of which he has collected up to date (1929) nearly 4000. The intense study of these exerted a profound influence upon the formation of his own style as a composer, which is an intimate blending of the characteristics of this folk-music with elements of impressionism, which latter he absorbed from his contact with Debussy during a stay in Paris in the winter of 1906–07. This enthusiasm for folk-song he shares with his compatriot Béla Bartók in collaboration with whom he has published two volumes of these songs, followed by three more volumes edited by himself alone. Besides a treatise, *The Pentatonic Scale in Hungarian Folk-music* (1917; in Hungarian), he also wrote numerous articles on the subject for Hungarian, Italian, and French journals. His original compositions are mainly in the field of chamber music (sonatas, string quartets). His most ambitious work is *Psalmus Hungaricus* (Psalm LV) for tenor, chorus, and orchestra; his best-known work, an orchestral suite arranged from incidental music to Garay's *Háry János*.

**KOEHLER, KÄRL, WOLFGANG** (1887– ). A German psychologist, born at Reval in Estonia, and educated at the universities of Tübingen, Bonn, and Berlin. After teaching in German schools, he found himself during the World War at an anthropoid research station in German South Africa. There, he conducted investigations on the perceptive capacities of chimpanzees and apes. After the War, he was professor at the University of Berlin. On leave of absence in 1924, he lectured at Clark University, in the United States. His researches in animal psychology led Koehler to become one of the leaders of the new school of German psychology known at the *Gestaltpsychologie* or psychology of forms. His published work comprises, in addition to a number of monographs, the volume, *Die Physischen Gestalten in Ruhe und im stationären Zustand* (1920), and *Intelligenzprüfungen an Menschenaffen* (1921).

**KOESTER, FRANK** (1876–1927). A German-American engineer, born at Sterkrade, Germany. Trained in his profession in Germany, he came to the United States in 1902. His first engagement was with the New York Subway Construction Company, after which he served as engineer with the Guggenheim Exploration Company, the American Smelting and Refining Company, and similar corporations. In 1911 he entered consulting practice in New York City and was lighting expert for Allentown, Scranton, and other cities in Pennsylvania. Besides patenting numerous improvements in plant engineering, he wrote *Steam Electric Power Plants* (1908); *Hydroelectric Developments and Engineering* (1909); *Electricity for the Farm and Home* (1913); *The Price of Inefficiency* (1913); *Modern City Planning and Maintenance* (1914); *Secrets of German Progress* (1915); *Under the Desert Stars*; and *The Gods of the North* (1923).

**KOFFKA, KURT** (1886– ). A German psychologist, born at Berlin and educated at the University of Berlin and at Edinburgh. He became professor of psychology at the University of Gießen and founded the periodical, *Psychologische Forschung*, with a new orientation for

experimental psychology. His published writings include: *Experimentaluntersuchungen zur Lehre vom Rhythmus* (1908); *Ueber Vorstellungen* (1911); *Zur Analyse der Vorstellungen und Ihrer Gesetze* (1912); *Beiträge zur Psychologie der Gestalt* (1919); *Die Grundlagen der Psychischen Entwicklung* (1921); and *Growth of the Mind* (tr., 1924).

**KOKOSCHKA, OSKAR** (1886– ). An Austrian poet, painter, and dramatist, conspicuous among the modernist artists. He became a professor in Berlin. Since the publication of *Die träumenden Knaben*, a poem in free verse illustrated by himself (1908), he has written the plays *Mörder, Hoffnung der Frauen* (1907); *Der brennende Dornbusch* (1911); *Hiob* (1917); *Orpheus und Eurydike* (1919).

**KOLAR, VICTOR** (1888– ). A well-known violinist and composer, born in Budapest, of Bohemian parents. After graduating from the Prague Conservatory, where he studied violin under Kubelik and composition under Dvořák, he came to the United States in 1904. In 1905–07 he was one of the first violinists of the Pittsburgh Symphony Orchestra, then joined the New York Symphony Orchestra, becoming assistant conductor in 1915, and from there went to Detroit, in 1919, as concert master and assistant conductor of the Detroit Symphony Orchestra. He wrote *Symphony in D*; two symphonic poems, *Hiawatha* and *A Fairy Tale*; two orchestral suites, *Americana* and *Lyric*; a string quartet in E minor; pieces for violin; and songs.

**KOLCHAK, KÖL'CHIK, VLADIMIR VASILIEVITCH** (1874–1920). A Russian admiral and soldier. During the Russo-Japanese War, he distinguished himself in the defense of Port Arthur, and from 1906 to 1916 he was on the general staff of the navy. During the World War, he showed military ability and became rear admiral in 1916, later being given an independent command in the Baltic and a promotion to vice admiral and commander of the Black Sea Fleet. Following the Revolution in 1917, he became an anti-Bolshevik leader, and his brilliant successes at first gained him virtual leadership. In 1919, however, he gradually lost ground, and at the end of that year, following brief successes, he was obliged to retire to Vladivostok, where, in January, 1920, an anti-Kolchak revolution broke out. On June 24, he surrendered to the revolutionary forces at Irkutsk and was executed. See sections on *History* in the articles *RUSSIA* and *SIBERIA*.

**KONTI, ISIDORE** (1862– ). An American sculptor (see VOL. XIII). Among his later works, in his refined and decorative manner, were a fountain in Audubon Park in New Orleans, the memorial to Bishop Potter in St. John's Cathedral, New York City, and an ideal work in bronze, *The Genius of Immortality*, in the Metropolitan Museum, New York City.

**KOO, VI KUYUIN WELLINGTON** (1887– ). A Chinese statesman and diplomat who studied at Columbia University and received the degree of doctor of philosophy. He was successively English secretary to President Yuan Shi-kai, councillor in the Foreign Office, Minister to Washington (1915), China's plenipotentiary and then head of her delegation to the Paris Peace Conference, Chinese representative in the Assembly of the League of Nations, Minister to Great Britain (1921), a delegate to the Washington Disarmament Conference (1921–22), Minister of Foreign Affairs at Peking (August, 1922–24),

Finance Minister (1926), and Premier and Minister for Foreign Affairs (1926-27). In 1927 he was appointed China's representative on the International Court of Arbitration at the Hague.

**KOREA, OR CHOSŌN.** A dependency of Japan, occupying the peninsula on the mainland of Asia opposite the main island of Honshū. Area, 85,241 square miles, 82,930 being on the mainland and 2302 in neighboring islands. According to the census figures of Oct. 1, 1925, the population was 19,519,927, as compared with 17,288,989 in 1920. The foreigners numbered slightly more than 45,000, the vast majority of whom are Chinese. The largest cities with their populations at the end of 1926 were: Seoul, 306,363 (81,559 Japanese); Pusan, 106,323 (40,803 Japanese); and Pyong-Yang, 114,371 (23,545 Japanese).

**Production and Industry.** Korea is almost entirely an agricultural country; the cultivated area at the end of 1926 was 11,276,115 acres. The chief crops are rice, barley, wheat, beans, grain of all kinds, tobacco, and cotton. In 1927 the rice crop amounted to 84,998,445 bushels; in the previous year, the barley production was 35,410,630 bushels; agricultural products also included 21,757,687 bushels of soya beans, 157,489,981 pounds of upland American cotton, and 57,149,756 pounds of native cotton. The native industries include textile fabrics, paper, pottery, metal ware, manufactured tobacco, brewed drinks, and leather. All the industries are of the cottage variety. The chief mineral products are gold, silver, zinc, copper, lead, iron, tungsten ore, graphite, coal, quartz, and kaolin. The total value of mineral products in 1926 was 24,130,350 yen.

**Foreign Trade.** 1927 imports amounted to \$181,778,000, consisting principally of cotton gray sheeting, coal, lumber, machinery, cotton fabrics, Chinese hemp fabrics, petroleum, sugar, and cotton yarn. 1914 imports were \$31,615,000. Similarly, 1927 exports amounted to \$170,160,000, consisting principally of rice, beans, raw silk, including tussah silk, iron and steel, fish, ginseng, fertilizer, cotton, gold, cowhides, cattle, paper, and pulp. In 1914 exports were \$17,194,000, consisting of rice, beans, peas, cowhides, ginseng, cotton, and leather manufactures.

**Communications.** The total mileage of government railways open for traffic on Mar. 31, 1928, was 1456.5 miles, and the total mileage of private railways at the same date was 513.8 miles. On Oct. 1, 1928, there was celebrated the completion of the Tanko Railway line between Genzan and Kwainai, a distance of 388.4 miles. Work was also being pushed on the Hei-Gen line between Heijo and Genzan, a route that when completed would cross the north of Korea. Provision was made for the construction of further new lines and the addition by purchase of 210 miles of private railways to the government system. The lines under construction and projected were designed to transport forest products from the upper districts of the Yolu River, minerals from northern Korea, marine products from the eastern coast of the peninsula, and agricultural products from southern Korea. It was estimated that within 10 years the total mileage of all railways in Korea would amount to 3500 miles. All of the lines were well equipped with modern rolling stock.

**Mining.** The principal mineral products of Korea are gold, silver, copper, zinc, lead, iron, tungsten ore, graphite, coal, quartz sand, and

kaolin. Gold mining on a large scale has been carried on by Europeans and Americans, but more recently, mine owners in Japan have begun mining various metals and other minerals in various parts of the peninsula, so that there is a tendency to expand the mining industry more and more each year. The total annual yield of all the mines in Korea in 1916 was 14,078,188 yen. It increased in 1918 to 30,838,074 yen and after the War declined to 14,503,781 yen in 1922, increasing by 1927 to 24,169,229 yen.

**Forestry.** The total area of forests and plains has been estimated at 15,867,762 hectares of which 5,454,545 hectares is occupied by State forests, while the remainder is hilly districts with young trees or bare of trees. The government has encouraged afforestation and the annual cutting of forests amounts to about 1,255,000 cubic meters. In the fiscal year 1927, the receipts from State forests were 6,627,004 yen, the expenses, 4,271,274 yen, leaving a balance of 2,355,730 yen.

**Government Enterprises.** Among the monopolies maintained by the Government is the culture of ginseng, the annual production of which is estimated at 21,000 kilograms and the value at 2,200,000 yen. The manufacture of salt, another government monopoly, has an annual production capacity of 120,000 metric tons. Tobacco also is cultivated as a government monopoly with profit to the Government in 1927-28 of 13,580,150 yen.

**Budget and Finance.** Total expenditures and revenues for 1927-28 were \$157,852,000 (1913-14: \$31,546,744); total debt Mar. 31, 1927, was 298,619,147 yen (\$148,852,000) 1916: \$36,801,000.

**History.** Under Japanese administration, the province progressed materially. Bare hill-sides were afforested, agriculture received the benefit of scientific supervision, and railways were built. Advances were startling in every line of economic activity; but the absolute character of the Japanese authority, the dominance by the military, the refusal to heed the demands for a larger measure of popular government, all contributed to a feeling of resentment which the democratic doctrines of the War finally fanned into open hostility. Throughout 1919 there were everywhere marked evidences of unrest; means of communication were cut; cities were the scenes of mob violence; public officials were attacked and some even killed. The Japanese, on the other hand, retaliated by increasing their garrisons and by employing repressive measures. By April, the riots had taken on so much of the character of actual rebellion that the Japanese Privy Council was spurred into action. A programme of reform introduced during the year included the extension of civil government at the expense of the military and responsibility of the governor to the Japanese Ministry. Korea was made an integral part of the Japanese Empire, and Koreans were put on the same footing as Japanese, nominally at least. Members of the former Korean dynasty and cabinet received Japanese patents of nobility. In 1920, the Korean tariff was assimilated to that of Japan. Meanwhile a revolutionary party, through a committee at Shanghai, promulgated a republican constitution for the "Provisional Government of the Korean Republic." An attempt was made to interest Soviet Russia in the struggle of the Koreans for independence, while natives and friends of Korea in other countries, espe-

cially in the United States, endeavored to show sympathy for Korean aspirations by giving publicity to acts of oppression, violations of the right of pro-Korean missionaries, summary executions of Korean patriots, etc., alleged to have been committed by the Japanese in Korea.

Disorders were suppressed with severity by the military. On Apr. 25, 1926, Prince Yi Wang, the deposed Emperor, died and the Japanese government took extraordinary precautions to prevent an ensuing outbreak. On April 29, Alderman Takayama was assassinated and Alderman Kato stabbed by a Korean. The Japanese tried to placate Korean national feeling by giving the ex-Emperor a most elaborate funeral and decreeing June 10 as a day of mourning throughout the Japanese Empire; but the move did not prevent threats of rioting in Seoul, and some hundreds of arrests were made. In spite of the marked improvement in almost every department of the country's life under Japanese rule, the restless suppressed agitation for independence continued. Lacking other outlet, it appeared to link itself with communist movements, at least in the eyes of the Japanese government. In April, 1927, the courts decided that 99 Koreans arrested in the previous summer must stand trial on the charge of communism. The case dragged on and was not finally decided until February, 1928, when most of the defendants were sentenced to prison. In the same month 33 other communists were arrested in Seoul and in June an attempt was made on the life of the Governor General. These evidences of continued dissatisfaction, however, brought no concessions from the Government and the outlook continued to be apparently most unpromising for the hopes of Korean Nationalists.

**KORNGOLD, ERICH WOLFGANG** (1897- ). An Austrian composer (see VOL XIII). In 1919-26 he was conductor at the Stadttheater in Hamburg. He then returned to Vienna, where he was appointed, in 1927, professor of theory and conducting at the Staatsakademie für Musik. He added to his works the operas *Der Ring des Polykrates* and *Violanta* (both in Munich, 1916; the former in Philadelphia, the latter in New York, 1927); *Die tote Stadt* (Hamburg, 1920; New York, 1921); *Das Wunder der Heliane* (Hamburg, 1927); incidental music to *Much Ado about Nothing*; a symphonic overture, *Sursum Corda*; a piano concerto in C# minor for left hand alone (for the one-armed pianist Paul Wittgenstein); a string sextet in D; a string quartet in A; and a piano quintet in E.

**KORNILOV, LAVR GEORGEVITCH** (1870-1918). A Russian general who entered the army in 1888 and served in the Russo-Japanese War, as Russian military agent in China (1907-11), and as commander in Siberia. On the outbreak of the World War, he commanded a division in Galicia. Captured by the Austrians, he escaped and in 1916 assumed command of the 25th Army Corps. At the outbreak of the Revolution in March, 1917, he was made commander-in-chief of the troops in Petrograd, but resigned on account of lack of discipline and was assigned to the command of the 8th Army Corps. In September, 1917, he attempted to establish himself as dictator by marching on Petrograd, but the movement collapsed and he surrendered. Escaping to the Caucasus, he gathered a force of Cossacks and was killed in action against the Soviet forces in March, 1918. See RUSSIA, under *History*.

**KOROSEĆ, ANTON** (1872- ). A Yugoslav public official, leader of the Slovenian People's Party. He was head of the Slovene delegation to the Croatian-Slovene National Council which voted for union with Serbia in 1918. From July until November, 1924, he was a member of the Yugoslav cabinet headed by Davidović. His party advocates an autonomistic regrouping of the kingdom.

**KOSSAK, WOJCIECH, ADALBERT VON** (1857- ). A Polish painter, born in Paris, who studied under his father and at the Munich Academy. He became widely known for his battle pictures which won the highest awards at Munich, Vienna, Berlin, and Paris. His works are in the National Museum at Cracow, the Royal Gallery in Budapest and in the galleries of Vienna and Berlin. He has lived in Paris since 1902.

**KÖSTER, KÄSTÖR, ADOLF** (1883- ). A German writer and public official, born at Verden and educated at the universities of Halle, Marburg, Heidelberg, and Zurich. He was lecturer at the University of Munich, traveled in England, America, Asia, and Africa, and during the World War was correspondent for Social-Democratic papers. He was Minister of the Interior from October, 1921, to August, 1923. He has written *Die Ethik Pascals* (1906); *Der Junge Kant* (1913); *Die Zehn Schornsteine* (1909); *Die Bange Nacht* (1913); *Der Tod in Flandern* (1915); *Brennendes Blut* (1916); *Der Kampf um Schleswig* (1920); *Können wir weiterkämpfen?* (1921); *Fort mit der Dolchstichlegende* (1922); and *Unser Recht* (1923).

**KOSTROWIECKI, A. VON.** See APOLLINAIRE, GUILLAUME.

**KOUSSEVITZKY, SERGEI (ALEXANDROVICH)** (1874- ). A Russian conductor and virtuoso on the double-bass (see VOL. XIII). In 1910 he founded a publishing house devoted almost exclusively to the publication of modernistic works (Skriabin, Stravinsky, Prokofiev, Medtner, etc.). The revolution of 1917 ended all his activities in Russia. The orchestra was disbanded and the publishing firm confiscated by the provisional government. In 1920 he left Russia and settled in Paris, where he immediately established a series of concerts for the production of modernistic works, and also conducted Russian operas at the Opéra, at the same time undertaking extensive tours as guest-conductor of Germany, England, Italy, and Spain. In 1924 he became conductor of the Boston Symphony Orchestra, which under his direction fully regained its former prestige. He was decorated with the cross of the Legion of Honor (1924), in 1926 was made Mus.Doc. by Brown University. In 1929 he received an honorary LL.D. degree from Harvard University.

**KOWEIT.** See ARABIA.

**KRAEMER, HENRY** (1868-1924). An American pharmacist, born at Philadelphia, Pa., educated at the Philadelphia College of Pharmacy and Columbia and Marburg universities. He was instructor of the New York College of Pharmacy and during 1895-97, professor of botany at Northwestern University. In 1897 he accepted the chair of botany and pharmacognosy at the Philadelphia College of Pharmacy and became also director of the microscopical laboratory. These places he held until 1917, when he accepted a similar chair at Michigan, where he served also as dean. In 1920 he became direc-

tor of the Kraemer Scientific Laboratory. He was editor of the *American Journal of Pharmacology*, 1898-1917, and in 1900 became a member of the committee of revision of the United States Pharmacopeia. He is the author of *A Textbook of Botany and Pharmacognosy* (1902); *Applied and Economic Botany* (1914); and *Scientific and Applied Pharmacognosy* (1915).

**KRAEPELIN, EMIL** (1856-1926). A German psychiatrist who revolutionized some of the conceptions of insanity. After receiving his degree in medicine, he studied in the psychological laboratory of Wundt and was assistant under Flechsig. He was professor of psychiatry successively at the Universities of Dorpat, Heidelberg, and Munich, and then retired to devote himself to his Research Institute. Kraepelin made trips to the tropics of both hemispheres to study insanity in primitive peoples. His first work on psychiatry was issued in 1883 and he published numerous volumes which were translated into English and French. All of his work, revised to date, was published in four volumes between 1909 and 1915. Kraepelin brought most of the endogenous insanities under two heads, dementia præcox or early mental failure and manic-depressive insanity.

**KRAFT, KRIFFT, ZDENKO VON** (1886- ). An Austrian writer, born at Gitschin, and privately educated with special attention to drama and music. His works include: *Adagio Consonante* (1910); *Maria Theresa* (1918); *Missa Solemnis* (1920); and a trilogy of novels on the life of Wagner, *Barrikaden* (1920); *Liebested* (1921); and *Wahnfried* (1922). Later works are *Alljeder*, stories (1922); *Lord Byron's Pilgerfahrt*, a novel (1924); *Michael Unbekannt*, novel (1925); *Bruder Silverius*, novel (1925); and *Der Sohn der Mutter* (1927).

**KRALIK VON MEYERSWALDEN, RICHARD** (1852- ). An Austrian writer, born at Eleonorenheim in Bohemia and educated at the universities of Vienna, Bonn, and Berlin. His works include: *Maximilian*, a drama (1885); *Deutsche Puppenspiele* (1885); *Kaiser Marcus Aurelius in Wien*, a drama (1897); *Veronica*, a drama (1898); *Rolands Tod* (1898); *Die Revolution* (1908); *Die Katholische Literaturbewegung der Gegenwart* (1909); *Geschichte von Wien* (1911); *Geschichte der Neuesten Zeit* (1914-20); *Die Neue Staatenordnung* (1918); *Grundriss und Kern der Weltgeschichte* (1920); *Abraham a Santa Clara* (1922); *Weltliteratur der Gegenwart* (1923); *Heinrich von Ofterdingen*, a novel (1923); and the plays *Kaiser Julianus* (1923); *Belsazzar* (1923); *Theophrastus Parazelsus* (1925); *Der letzte Nibelung* (1925); *Der wahre Samaritaner* (1927).

**KRAMER, A. WALTER** (1890- ). An American composer, born in New York City. He studied violin with C. Hauser and R. Arnold, but in composition he is practically self-taught. In 1910 he joined the staff of *Musical America*, leaving in 1922 to go abroad. He has contributed to other periodicals. His compositions include a symphonic poem, *The Tragedy of Nan*; four *Sketches* for orchestra; a *Rhapsody* for violin and orchestra; a suite for string orchestras; *The Hour of Prayer* for baritone, chorus, and orchestra; a string quartet; compositions for organ and for piano; and songs.

**KRAPF, GEORGE PHILIP** (1872- ). An American teacher of English, born at Cincinnati, Ohio, and educated at Wittenberg College and at Johns Hopkins University. He served for sev-

eral years as an instructor of English at the Horace Mann School and in Teachers College. In 1907 he was adjunct professor of English at Columbia and, from 1908 to 1910, was a professor at the University of Cincinnati. In the latter year, he was appointed professor of English at Columbia. He was a member of many learned societies and author of *The Elements of English Grammar* (1908); *In Oldest England* (1912); *Pronunciation of Standard English in America* (1919); *Tales of True Knights* (1920); *First Lessons in Speech Improvement* (1922); *The English Language in America* (1925); *Comprehensive Guide to Good English* (1927); *The Knowledge of English* (1927).

**KRAUS, CHARLES AUGUST** (1875- ). An American physical chemist, born at Knightsville, Ind., and educated at the University of Kansas, Johns Hopkins University, and the Massachusetts Institute of Technology, where he was a research associate in physical chemistry during 1908-12 and assistant professor during 1912-14. In 1914-24 he was professor of chemistry and director of the chemical laboratory at Clark University. Since 1924 he has had a like position at Brown University. The subjects of solutions, organic radicals, and vapor electric apparatus have received his attention. He was Nichols Medalist in 1923. He is the author of *Electrically Conducting Systems*.

**KRAUS, EDWARD HENRY** (1875- ). An American mineralogist, born at Syracuse, N. Y., and educated at the Universities of Syracuse and Munich. During 1896-99 he was instructor in German and mineralogy at Syracuse, where he became associate professor of mineralogy in 1902, and in 1902-04 he was in charge of the department of science at the Syracuse High School. In 1904 he was called to the University of Michigan, where in 1919 he was appointed to the chair of crystallography and mineralogy. He was also director of the mineralogical laboratory (1908-19), dean of the summer session (1915- ), and dean of the College of Pharmacy (1923- ). Besides many papers on chemical and physical crystallography and the optical constants of crystal at varying temperatures, he has written *Essentials of Crystallography* (1906); *Descriptive Mineralogy* (1911); *Tables for the Determination of Minerals*, with W. F. Hunt (1911); *Elementary Mineralogy*, also with Hunt (1920); and *Gems and Gem Materials*, with E. F. Holden (1925).

**KRAUSKOPF, JOSEPH** (1858-1923). An American rabbi, born in Germany. In 1872 he emigrated to the United States and received his degrees from the University of Cincinnati and the Hebrew Union College, both in 1883. He was rabbi in Kansas City from 1883 to 1887 and went to Philadelphia in the latter year. He was the founder of the Jewish Publication Society of America and of the National Farm School. In 1898 he was appointed special relief commissioner to Cuba and was special commissioner and agricultural commissioner in Europe for several years following. In 1904-05 he was president of the Conference of American Rabbis and was an official of other societies. He wrote *The Jews and Moors in Spain*; *My Visit to Tolstoy*; *The Seven Ages of Man*; *The Service Manual*; *The Service Ritual*; and many volumes of lectures. From 1917 to 1920, he was representative of Jewish organizations in the Food Conservation Department in Washington.



**KRAUSS, CLEMENS** (1893— ). A distinguished Austrian conductor, born in Vienna. He came of a very musical family, for the famous star of the Paris Opéra, Gabriele Krauss, was his grand-aunt, and his own mother, Clementine, was one of the principal dramatic sopranos of the Vienna Volksoper. At the age of nine, he was a singer in the Imperial Court Chapel, and later studied under Reinhold (piano) and Grädener and Heuberger (composition) at the Vienna Conservatory. After graduation, 1912, he became chorus master at the Stadttheater in Brünn, then second conductor at the Deutsches Theater in Riga (1913-14), in Nuremberg (1915-16), first conductor in Stettin (1916-21), and then conductor at the Opera and of the symphony concerts in Graz (1921-22). In 1922 he went to Vienna as conductor at the Staatsoper and director of the Kirchenmusikschule connected with the Staatsakademie für Musik, and the following year also succeeded Furtwängler as conductor of the Tonkünstlerverein. In 1924-28 he was intendant of the Opera and conductor of the Museumskonzerte in Frankfurt, while retaining at the same time his connection with the Staatsakademie and the Tonkünstlerverein in Vienna. In 1929 he appeared in the United States as guest-conductor of the Philadelphia Symphony Orchestra and the New York Philharmonic-Symphony Orchestra. Returning to Vienna in the fall of 1929, he became director of the Staatsoper there.

**KREGER, EDWARD ALBERT** (1868— ). An American army officer, born at Keota, Iowa, and graduated from the Iowa State College in 1890. He enlisted for the Spanish-American War with the Iowa troops, was commissioned first lieutenant of the Regular Army (1901) and then served in the Philippines and in Cuba. From 1914 to 1917 he was professor of law at the United States Military Academy and in 1917-18 was assistant to the Provost Marshal. He was acting judge advocate general with the Army in France in 1918-19, and was acting judge advocate general of the United States Army in 1919-21, holding the temporary rank of brigadier general in 1918-20. He was judge advocate of the 3d Corps Area, 1924-25; legal adviser in the Tacna-Arica Arbitration, 1925-27; and judge advocate of the 2d Corps Area after 1927. He received the Distinguished Service Cross for heroism in action in the Philippines and the Distinguished Service Medal for distinguished service as acting judge advocate general.

**KREHBIEL, HENRY EDWARD** (1854-1923). An American music critic (see Vol. XIII). In 1917 he published *A Second Book of Operas* and in 1919 *More Chapters of Opera and Parsifal, an English Version for Performance*, which was used by the Metropolitan Opera Company. In 1921 he published *The Life of Beethoven*, in 3 volumes, being a condensation of the 5 volumes of Thayer's German original.

**KRENEK, ERNST** (1900— ). An Austrian composer, born in Vienna. A pupil of the extreme modernist, Schreker, he succeeded from the very outset of his career in surpassing his master and most of the other extremists in sheer extravagance. Being able to feel the pulse of the times, and alert to seize the psychological moment, he capitalized the craze for jazz, which swept all Germany after the tour of Paul Whiteman in 1926, and wrote the farcical jazz opera, *Johnny spielt auf*, which scored an enormous success in Leipzig (1927), quickly made the

rounds of the principal German opera houses and even found its way to Paris (1928) and the Metropolitan Opera House (1929). His other stage works are *Der Sprung über den Schatten* (Frankfort, 1924), *Orpheus und Euridike* (Kassel, 1926), and the three one-act operas *Der Diktator*, *Das geheime Königreich*, and *Die Ehre der Nation* (Kassel, 1928). All these works confirm in many minds the impression that his only object in writing is caricature or buffoonery. Nor are his numerous instrumental works worthy of serious consideration.

**KRETSCHMER, ERNST** (1888— ). A German physician, anthropologist, and professor of psychiatry at the University of Tübingen. He became distinguished through his writings, the best known being *Körperbau und Charakter* (1921), which had an English translation, and *Medizinische Psychologie* (1922), which was translated into French. Two of his earlier works have recently been reissued, *Der Sensitive Beziehungswahn* (1918 and 1927) and *Ueber Hysterie* (1918 and 1926).

**KROEBER, ALFRED L(OUIS)** (1876— ). An American anthropologist (see Vol. XIII). In 1917 he founded and was president of the American Anthropological Association. He became professor of anthropology at the University of California in 1919 and director of its Anthropological Museum in 1925. He also made anthropological expeditions to Mexico (1924) and Peru (1925-26). In 1928 he was elected a member of the National Academy of Sciences. His later publications include: *Zuni Potsherds and Hohan* (1915); *Floral Relations among the Galapagos Islands* (1916); *Zuni Kin and Clan* (1917); *Tribes of the Pacific Coast* (1917); *The History of Philippine Civilization as Reflected in Religious Nomenclature* (1918); *Kinship in the Philippines* (1919); *Peoples of the Philippines* (1919); *Yuman Tribes of the Lower Colorado* (1920); *Basketry Designs of the Mission Indians* (1922); *Anthropology* (1923); *Archaic Culture Horizons in the Valley of Mexico* (1925); *Archaeological Explorations in Peru, Part I* (1926).

**KROEGER, ERNEST RICHARD** (1862— ). An American organist and composer, born at St. Louis. After completing his entire musical education under local teachers, he served as organist in various churches in St. Louis and as conductor of several choral societies. He traveled extensively as a concert organist. His principal compositions are the overtures, *Thanatopsis*, *Pittoresque*, *Endymion*, *Sardanapalus*, *Hiawatha*, *Atala*, and *Festival*; a symphonic poem, *Mississippi*; four string quartets, a piano quintet, a piano quartet, a piano trio; many pieces for organ and for piano, especially in the larger forms; and over 100 songs.

**KROGH, KRÖK, AUGUST** (1874— ). A Danish physiologist, born in Grenaa and educated at the University of Copenhagen. He devoted himself to the study of anatomy and physiology with special reference to comparative biology and in 1916 was appointed professor of zoophysiology at the University of Copenhagen, in the same year becoming a member of the Danish Royal Society of Science. He published two well-known works which were translated into English and German: *The Respiratory Exchange of Animals and Man* (1916) and *Anatomy and Physiology of Capillaries* (1922). In the same year, he published the *Silliman Lectures* given at Yale University (2d ed., 1928).

In 1903 he received the Seegen Prize from the Academy of Science of Vienna, and in 1920 he was awarded the Nobel Prize for medicine and physiology.

**KRUEGER**, kru'gër, FELIX (1874- ). A German philosopher and psychologist. He succeeded to the chair of Wundt at the University of Leipzig on the latter's death in 1920. Best known for his *Untersuchungen über Entwicklungspsychologie* (1915), in which he studied social psychology from a historical point of view, he was also the author of several philosophical works. These include *Ist Philosophie ohne Psychologie Möglich?* (1896); *Der Begriff des Absolut Wertvollen* (1898); and *Der Strukturbegriff in der Psychologie* (1924). From Leipzig, Krueger directed a group of researches and studies under the general title of *Entwicklungspsychologie* (Development Psychology).

**KÜCHLER**, K. F. WALTHER (1877- ). A German writer and professor, born at Essen and educated at the University of Leipzig. He was instructor in German at the University of Nancy and at Cornell, lecturer at the University of Gießen, and professor of Romance languages at Würzburg, and, after 1922, at the University of Vienna. He is the author of *Marie Joseph Chéniers Lyrische und Dramatische Dichtungen* (1900); *Die Cent Nouvelles* (1906); *Französische Romantik* (1908); *Libussa* (1919); *Romain Rolland, Henri Barbusse, Fritz von Unruh* (1920); and *Ernest Renan* (1921).

**KÜHLMANN**, RICHARD VON (1873- ). A German diplomatist. He entered the diplomatic service in 1889 and after serving in various capacities, became counselor of the German Embassy in London in 1908. He was sent as German Ambassador to the Hague in April, 1915, and served at Constantinople in 1916-17. He was then appointed foreign secretary to succeed Zimmermann and held this position until his resignation in July, 1918. He was largely responsible for the treaties of Brest-Litovsk and Bucharest.

**KU KLUX KLAN**. An organization founded in 1915 by William Joseph Simmons, of Atlanta, Ga. While in a measure it is a revival of the society of the same name which flourished in the South during the reconstruction period, its aims and purposes are, in a larger sense, distinctly different. The organization of the modern society is claimed by Simmons to have been undertaken by him as the result of a vision. He preserved the regalia and some of the nomenclature of the original Klan, but to these he added other designations, all of which begin with the letters *kl*; e.g., Klokard, lecturer; Kladd, conductor; Kleagle, organizer; Klavern, meeting. The activities of the original Ku Klux Klan were directed almost entirely against the Negroes in the South, for the purpose of preventing their participation in social and political affairs. The modern Ku Klux Klan, although it theoretically avoids stating such as its purpose, is hostile chiefly to Jews and Roman Catholics. The fundamental doctrine of the Klan is "100 per cent Americanism." This, with its corollary principles of "no foreign allegiance" and "white supremacy," means in practice a campaign against Catholics, Jews, and Negroes, particularly the first. The growth of the movement was slow, until after the end of the Great War, when Edward Young Clarke, a former newspaper man, conceived the possibility of organization on a large scale. He was made Imperial Kleagle

and was appointed head of the propaganda department. Numerous agents were put in the field to organize in 40 States. They were called Kleagles. Each member enrolled paid \$10, of which the Kleagle received \$4 and the King Kleagle \$1; the remaining \$5 was sent to the Imperial Treasurer. As a result of these efforts, the Klan spread with marvelous rapidity, and its effects were soon apparent. The organization soon began to function as a censor of personal conduct in many localities and imposed punishment as it saw fit. The result was an outbreak of lawlessness in many States under the name of discipline. This lawlessness reached a climax during the summer of 1922, when murders were charged to its members in Inglewood, Calif., and Mer Rouge, La. There were also outbreaks of violence in various towns in Texas, Oklahoma, Pennsylvania, and other States. Governor Parker of Louisiana made a strong effort to bring about Federal Action to suppress the Klan in that State, but was not successful.

The entrance of the Klan into politics was a further step in its development. It was especially strong in the South and Middle West. In Texas, it was charged, Earle B. Mayfield was elected United States Senator in 1922 through the Klan's support. In Oregon, the Klan was sufficiently powerful to put through legislation banning parochial schools. In Oklahoma, its activities and the attempt of the governor to control them led to the latter's impeachment and removal. (See OKLAHOMA.)

At the height of its power in 1924, the Klan membership was put at between two and one-half and three millions. The following estimated memberships were to be found in the States where the order has its greatest strength: Indiana, 500,000; Ohio, 450,000; Texas, 415,000; California, 200,000; Oregon, 200,000; New York, 200,000; Oklahoma, 200,000; from 50,000 to 100,000 each in the following States: Arkansas, Washington, Kansas, Missouri, Michigan, Illinois, Kentucky, West Virginia, Maryland, New Jersey, Louisiana, Mississippi, Alabama, Florida, Georgia, and Tennessee. Internal dissension and scandals involving prominent Klansmen began to sap the order's strength, so that Senator Carter Glass of Virginia in 1927 could report that already the Klan was losing its hold in the South. By 1928 it was estimated that the Klan had dwindled to one-third its size in 1924 and that its power had been lost in such former strongholds as Georgia, Mississippi, Louisiana, Indiana, and Colorado. There were positive evidences that the Klan was on the decline as the period under survey closed (spring, 1929). The following were among the more important reasons for the waning influence of the order: internal troubles, scandals, a falling treasury, municipal and State action in compelling the Klan to unmask, and general ridicule. In the summer of 1929, the Klan definitely quit the North when it announced the return of its headquarters from Washington to Atlanta.

During the period under discussion, the Klan played an important part in national elections. At the Democratic Convention of 1924, the attempt of the enemies of the Klan to name it in the party platform as an agent of bigotry almost disrupted the convention. The final vote against naming the Klan, after a hysterical night of balloting, was 546.15 to 541.85. In the 1928 election, the Ku Klux Klan undoubtedly played

an important rôle in the defeat of Governor Smith. As a Catholic, a New Yorker, the friend of immigrants and Jews, he stood for everything repugnant to the Klan spirit and it was generally conceded that in the South and Middle West, the Klan did yeoman service in spreading the gospel of intolerance.

During 1926, 1927, and 1928, the order figured in a number of unsavory scandals that did much to hasten its decline. In Indiana, where it had been a power in politics, it received practically its death blow as a result of the conviction for murder of D. C. Stephenson, the State's Grand Dragon. In Alabama and Pennsylvania, the Klan gained a good deal of unwelcome public attention as a result of internal feuds. In the latter State, in 1928, a Federal judge threw two law suits involving disputing factions out of court because all concerned had come before him with "filthy hands." The court denounced the order as having "stirred up racial and religious prejudices, fomented disorders and unlawful assemblies . . . and that such unlawful assemblies and riots have in many instances been brought about for the avowed purpose on the part of the officers in control of increasing the membership of the organization."

Following the lead of New York State in 1923, many States passed laws to strip the order of its secrecy. These laws, as a rule, were so phrased as to require all organizations, except trade unions and fraternal orders, to give publicity to their regulations, oaths, and memberships. The Klan fought these laws in the courts and took the New York act up to the Supreme Court which, however, found the order for unmasking not unreasonable (Nov. 19, 1928). This decision was a serious blow to the order.

In 1923 dissension broke out between W. J. Simmons, the so-called "Emperor" and H. W. Evans, the Imperial Wizard. Their dispute was taken to court and resulted in the triumph of Dr. Evans who, through 1928, continued the active genius of the order. A woman's organization affiliated with the Klan is called the Kamelia.

**KÜLPE**, kul'pe, OSWALD (1862-1916). A German philosopher (see VOL. XIII). He died in 1915 before completing a treatise on psychological theory embodying the contentions of the imageless thought school. His unfinished work was published posthumously by his pupil Karl Bühler under the title, *Vorlesungen über Psychologie* (1922).

**KUMMER**, FREDERIC ARNOLD (1873- ). An American author and playwright, born in Catonsville, Md. His best-known works include: *Plaster Saints* (1921); *When the Earth was Young* (1922-23); *The Voice*, in which William Courtenay starred (1923). He often wrote under the pseudonym of Arnold Fredericks. Besides his work for the legitimate stage, he wrote many motion-picture scenarios, including *The Slave Market*, *The Yellow Pawn*, *Motherhood*, *The Ivory Snuff Box*, and *The Belgian*.

**KUN**, BÉLA (1886- ). A Hungarian Communist leader, born in Cöhen. He was in Russia during the World War and led a corps in the Red Army. Returning to Hungary early in 1919, he was arrested as a Communist agitator. He organized a revolution at Budapest, in February, 1919, which brought about the resignation of the Karolyi cabinet, and was appointed commissary for foreign affairs in the Hungarian

Soviet government in March. As recognition of this government was refused by the Allies, he made a military alliance with the Russian Soviet government. The Communist government was overthrown in August, 1919, and he fled to Austria, whose government refused to give him up. In July, 1920, he went to Russia where he was a government commissary in Crimea until 1921, when he became a member of the executive committee of the Communist International. On Apr. 26, 1928, he was arrested in Vienna, where he had established headquarters in a drug store two weeks previously. On June 26, he was sentenced to three months imprisonment (two of which he had already served) on a charge of belonging to a secret society and entering Austria on a false passport. At the close of his term, he was deported to Russia. His trial nearly caused a cabinet crisis. Consult *Die Sowjetführer Ungarns* by Zemléni (1924). See HUNGARY, under *History*.

**KUNZ**, GEORGE FREDERICK (1856- ). An American mineralogist (see VOL. XIII). Among his later writings are *E. Roly and His Work* (1914); *Magic of Jewels* (1915); *Ivory and the Elephant* (1915); *Shakespeare and Precious Stones* (1916); and *The Ring* (1917).

**KUPRIN**, ALEXANDER IVANOVITCH (1870- ). A Russian writer, belonging to the realistic school. He was an officer from 1890 to 1897, and his most famous novel was *The Duel* (1905), a story of barracks life. He also wrote delightful tales for children, and many sketches. His writings include *Short Stories* (1893-1918); *Sulamith* (1908); *The Pit* (1909-1913); *A Bracelet of Garnets* (1911); *Leagstrygonians* (1912); *The Black Sea Coast*; *Moloch*; *At Rest*; *A Slav Soul*, stories (1916); *Reminiscences of Anton Chekhov*, with Gorky and Bunin (1921); and *Gambrinus* (1925). After the Bolshevik Revolution, he lived in Paris.

**KURDISTAN**, kūr'dā-stān. A region in eastern Asia Minor comprising for the most part the Turkish vilayets of Mamuret-ul-Aziz, Diarbekr, Bitlis, Van, but also the northern section of the vilayet of Mosul in the now independent State of Iraq or Mesopotamia, and part of western Persia. It is inhabited by the Kurds, a seminomadic people related to the Persians in race and language, but belonging to the Sunni sect. The total population was estimated at 2,500,000. It had been the consistent policy of the old Turkish government to settle the Kurds among the Armenian populations, and thus, by singling them out for special favors, to create strong Mohammedan centres in these unruly vilayets. The independent spirit thus fostered naturally rendered the Kurds indifferent to the War, with the result that their participation was negligible. The Russian policy, once the Russians were in control of Erzerum and Bitlis after 1916, was designed along the same lines, and the Kurds were played off against the Armenians. The entry of the British into Mesopotamia, and the promises held out by British political officers of a Kurdish independent State, naturally made Kurdish leaders gravitate toward Great Britain. By the Treaty of Sévres (1920) provisions were made for the satisfaction of Kurdish national aspirations. An inter-Allied commission was to erect an autonomous government within the area east of the Euphrates, south of the future boundary of Armenia, and north of Syria and Mesopotamia; a commission of Allied representatives acting with Kurds and

Persians was to rectify the frontier between Kurdistan and Persia. If within one year from the coming into force of the treaty, the Kurds gave evidence to the League Council of their desire for complete independence, and if the council approved, Kurdistan was then to be raised to the dignity of a separate sovereign state, and, in that event, Great Britain must permit the voluntary adhesion of the Kurds in Mosul, part of the Mesopotamia mandate, to the new State. The failure of the Sèvres treaty and the realignments effected in subsequent years caused the hopes of the Kurds for independence to be forgotten; the final treaty of Lausanne in 1923 made no mention of a free Kurdistan; and the Kurds remained subject to alien rule. Like pre-war Poland, Kurdistan was divided among three alien nations, namely, Turkey, Persia, and Mesopotamia.

In February, 1925, a Kurdish revolt under the leadership of Sheik Said, a former revolutionary, broke out and gained support among those who felt that the Turkish government had tampered with the Sacred Law of Islam as well as among adherents of the deposed Sultan (See **TURKEY**) and the Caliphate. This movement which began in the region adjoining the Mosul vilayet on the north and northwest, affected all the Kurdish vilayets and martial law was proclaimed by the Ministry of Fethi Bey. Still more energetic measures were demanded and a new ministry undertook severe military action together with a summary tribunal possessing powers of life and death so that by April the uprising was put down after the insurgents had been defeated and their leaders captured near the town of Mush. The more important were tried at Diarbekr and Sheik Said and 47 of his followers after conviction were hanged on June 29. This suppression of the revolt did not entirely stop the guerilla warfare of the Kurds, but the situation after a year or so gradually calmed down.

**KURZ, kurtz, ISOLDE CLARA M.** (1853- ). A German writer, born at Stuttgart, the daughter of Hermann Kurz, novelist, translator, and librarian at the University of Tübingen. She lived for many years in Florence. She wrote *Gedichte* (1888); *Die Stadt des Lebens* (1902); *Neue Gedichte* (1905); *Hermann Kurz*, a biography (1906); *Lebensfluten* (1907); *Die Kinder der Lilith* (1909); *Cora und Andere Novellen* (1915); *Schwert aus der Scheide*, a volume of verse (1917); *Aus Meinen Jugendland*, an autobiographical work (1919); *Traumland* (1920); *Nächte von Fond* (1924); *Der Despot* (1925); *Vom Strande* (1925); *Der Caliban* (1926); and the autobiographical volume *Meiner Mutter* (1927). She also translated much from the French, English, Italian, and Russian, and received the degree of doctor *honoris causa* from the University of Tübingen.

**KURZ, SELMA** (1877- ). An Austrian coloratura soprano, born in Biala, Galicia. She made her début at the Opera in Frankfurt, where, after a short time she attracted the attention of Mahler, who, in 1899, engaged her for the Vienna Hofoper. Extensive leave of absence enabled her to appear as guest at the leading European opera houses. In 1921 she made a coast-to-coast tour of the United States, arousing great enthusiasm everywhere through the natural beauty of her voice and the perfection of her art, but she confined herself exclusively to the concert stage. She is married to Professor Halban, a Vienna physician.

**KUT-EL-AMARA.** See **WORLD WAR**, under *Turkish Front*.

**KUTSCHER, ARTUR** (1878- ). A German critic and historian, born in Hanover, and educated at the University of Munich. After 1915 he was professor in the University of München. He wrote *Natürgefühl in Goethes Lyrik* (1906); *Hebbel als Kritiker des Dramas* (1907); *Die Kunst und Unser Leben: Grundsätze zu einer Kritik* (1909); *Schiller und Wir* (1909); *Die Ausdrucksmittel der Bühne* (1910); *Hebbel und Grabbe* (1913); *Kriegstagebuch* (1915); *Frank Wedekind, Sein Leben und Sein Werk* (1921); and other works. He compiled an anthology of soldier songs, *Das Richtige Soldatenlied* (1917), edited the works of Frank Wedekind (1921), and made many stage adaptations.

**KUYBYSHEV, VALERIAN V.** (1888- ). A Russian Communist and Soviet public official, chairman of the Supreme Economic Council since 1927. Joining the Social Democratic Party in 1904, he was arrested in 1906 and banished to Siberia, but escaped. Under the Soviet régime, he served as Commissar for Workers' and Peasants' Inspection, president of the political bureau of the Communist Party, Soviet Plenipotentiary to Bokhara, and head of the State Electrification Committee.

**KWANGCHOW WAN.** See **FRENCH INDO-CHINA**.

**KYNE, PETER BERNARD** (1880- ). An American novelist, born in San Francisco, Calif., and educated in the public schools and in a business college of that city. For several years, he was engaged in the lumber business. He served in the Philippines during the Spanish-American War and was captain of the 144th Field Artillery during the World War. His books, which are widely popular, include *Three Grandfathers* (1913); *The Long Chance* (1914); *Cuppy Ricks* (1916); *The Valley of the Giants* (1918); *Kindred of the Dust* (1919); *The Green Pea Pirates* (1920); *Pride of Palomar* (1921); *The Go-Gotter* (1922); *Never the Twain Shall Meet* (1923); *The Enchanted Hill* (1924); *The Understanding Heart* (1925); *They Also Served* (1927); *Tide of Empire* (1928). He was a frequent contributor of short stories to magazines.

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## ABOR, AMERICAN FEDERATION OF.

A non-secret confederation of self-governing trade unions in the United States, Canada, Porto Rico, and Panama, comprising five industrial departments: the building trades, metal trade, union label trade, railway employees, and mining. Its paid-up membership increased nearly 300 per cent between 1910 and 1920, from 1,562,112 to 4,078,740; but after 1920 it began to fall and reached 2,926,468 in 1923. It was 2,933,545 in 1929, a gain of 37,482 over the previous year. The number of local unions in 1914 was 21,460; in 1921, 36,247; in 1928, 29,128. Samuel Gompers long held the presidency, being elected to that position at the 44th annual conference, in 1924, for the 43rd time. Following his death in December, 1924, William Green became president. During the World War, the organization made every effort to work with the Government of the United States; every single act of the president and executive council in connection with the War was unanimously approved without discussion. Its loyalty was strengthened by government recognition of trade-union standards and by such appointments as that of Samuel Gompers as an important member of the Committee of Council of National Defense and that of the first vice president as member of the Commission to the Russian People. This recognition on the part of the Government, and to some extent a rise in the cost of living, strengthened the leadership of the Federation during the war period. On the other hand, its influence was somewhat weakened in that the Labor Board frequently dealt directly with disaffected groups, instead of through the central organization of the Federation. Later, industrial instability, together with the prevalence of high wages, drew many workers away from the unions. In 1923 efforts were redoubled for the organization of nonunion labor, with much propaganda directed against the open shop.

In general, the American Federation of Labor has held firmly to its policy of nonpartisan political activity. Despite a serious movement beginning in 1918 to form a national labor party, and the election of two United States Senators in one State by the newly organized Farmer-Labor Party, the Federation maintained its political activity on the nonpartisan basis of "reward your friends; punish your enemies." In 1924 the Federation leaders wholeheartedly endorsed the candidacy of LaFollette.

The organization did not abate its hostility toward socialism, syndicalism, the I. W. W., and other radical labor movements. Although in 1920 the more radical element within the Federation triumphed over the conservative in favor of government ownership and operation of railways, carried on distinct opposition to the conservative administration through 1921, and demonstrated in 1922 over the question of recognition of the Russian Soviet government, the policy of the Federation is wholly directed by the conserva-

tives, the Federation taking the position that "those who seek to destroy the legitimate labor movement must do it from without." In its attitude toward social development through intervention by the State, the Federation likewise has maintained its traditional policy. This may be briefly outlined, in the Federation's own words, as favoring laws to protect the helpless, to abolish special privilege and to free industry for the working out of its purely industrial problems, to make government more responsive to the needs of the people and to deprive courts of the power to rule as well as to adjudicate.

Thus, the Federation has worked for protective laws for women and children, for seamen, and for government employees. It supported safety and health measures and adequate workmen's accident insurance legislation. It urged the advance planning of public works as an aid to combatting unemployment and the development of a permanent, effective public employment service, though it was hesitant about joining in the movement for unemployment insurance. It applauded the decision in 1920 against the Kansas Court of Industrial Arbitration and in many ways opposed the principle of compulsory arbitration strenuously. A constructive feature of the Federation's policy was its aid to coöperative schemes and its promotion of friendliness with farmers' organizations. A disappointing legal achievement was the clause that Congress put in the Clayton Anti-trust Law in 1914, a recognition of the principle that the labor of a human being is not a commodity or article of commerce, and thus a guarantee of certain rights in connection with labor organization and the use of the boycott. It proved to be an empty victory.

Among the measures of broad social import advocated by the Federation were the restriction of immigration; gradual reduction of Army and Navy; regulation of large industries; extension of popular control of government; limitation of the power of the Supreme Court; and an amendment to the Volstead Act permitting the manufacture and sale of beer. It protested against the ship subsidy bill and military education in the schools. It expressed an unfavorable opinion of the Ku Klux Klan as an unconstitutional organization and a detriment to labor. In connection with Negro labor, an effort was made to prevent the drawing of a color line, and a special organizer was sent to work among the Negroes in the South. The Federation officially declared its sympathy with India and Ireland; it favored the entrance of the United States into the League of Nations and the World Court.

Although the Federation sent no representative to the Inter-Allied Labor Conference at London in 1918 or to the conference in Berne after the Armistice, although its proposition for an inter-Allied labor conference at Paris was not accepted, and although it could not be officially represented at the meeting of the Labor



Department of the League of Nations at Washington in 1919, its international relations widened appreciably during these years. In 1916 steps were taken to cultivate friendly relations with organized labor in Mexico, South America, and Japan. A Pan-American Federation of Labor Conference Committee was created in that year. In 1918 small groups were sent to Europe to confer unofficially with organized labor in Allied countries, and in 1919 the Federation was represented at the International Trade Conference in Amsterdam. While the peace terms were under discussion, the Federation formulated its official attitude on the matter; this was based largely on the declaration of President Wilson, which included in its suggestions that the treaty bar from shipment in international commerce all products involving the labor of children under 16 and that it declare for the basic standard of an 8-hour day. In 1923 affiliation with the International Federation of Trade Unions was strongly recommended, but year after year action was delayed. The Federation's fear of radical thought is shown in its consistent fight against recognition of Soviet Russia, and in its withdrawal of support in 1928 from Brookwood Labor College.

A significant development is the Federation's Union Labor Life Insurance Company which, since its incorporation in 1925, has written a vast amount of life, accident, and health insurance for its trade-union members. See **TRADE-UNIONISM**.

**LABOR ARBITRATION.** The period after 1914 witnessed an increased recognition of the imperative necessity of applying methods of arbitration and conciliation to industrial disputes. Concentrated efforts were made during that period to prevent by the wider use of arbitration the harmful effects of strikes, lockouts, and other violent means of settling industrial controversies, and, although many attempts were unsuccessful, there were marked advances toward industrial peace. Public opinion at least had been awakened to the undeniable desirability of the substitution of peaceful action for violence. The more complex nature of industrial problems in the later years, the importance of unobstructed production during the World War, the stronger organization and the increased sense of power of the trade unions, the unsettled industrial conditions after the War and the resulting unrest, the growing demands on the part of the workers, the steadily increasing specialization and interconnection of industries, all combined to bring about a realization of the imperativeness of labor arbitration. This realization found expression not only in governmental action, but also in numerous attempts on the part of employers and employees to find a *modus vivendi* in industry. Thus, the period was characterized by a constantly increasing number of trade-union agreements making provision for various methods of conciliation.

**The United States.** During 1914 a number of serious strikes and labor disputes were successfully settled by arbitration. The most important event of that year in arbitration legislation was the enactment by Alaska of an elaborate law relating to the adjustment of trade disputes. In 1915, a year of many strikes, the Department of Labor offered its services as mediator in 32 labor controversies, of which 24 were amicably settled, the most important being the Western Railroad case. In the same year, Colo-

rado passed a law setting up an industrial commission with wide powers to arbitrate. John D. Rockefeller, Jr., advanced his Industrial Representation Plan, a comprehensive scheme for the handling of all relations between employers and employees. Of far-reaching importance was the effective trade agreement made in the New York clothing industry, whereby a two years' peace was established.

The year 1916 brought an increase in sentiment for the amicable settlement of labor disputes, which was manifested in the various attempts to terminate by arbitration the troublesome strikes and conflicts of that year, and in the arbitration machinery agreed upon between the Boston Elevated Railroad Company and its employees, and in another case between the Hart, Schaffner & Marx Co. in Chicago and the Amalgamated Clothing Workers; but the most notable event of the year was the passage by Congress of the Adamson Eight-hour Law. After unsuccessful attempts at arbitrating the disputes which threatened to bring about a strike of the four railroad brotherhoods, a law was passed providing that after Jan. 1, 1917, "eight hours shall, in contracts for labor and service, be deemed as a day's work," and empowering the President to appoint a commission of three to investigate for a period of six years the workings of the law. Opponents of the Adamson Law criticized it as being a result of intimidation by the brotherhoods and as imperiling the principle of arbitration. On Dec. 5, 1916, President Wilson made a plea for full public investigation of industrial disputes as an effective means for the prevention of strikes.

With the entrance of the United States into the War, prevention of labor disputes became especially urgent and a labor policy toward that end was entered upon by the Government. As a consequence, the Committee on Labor of the Advisory Commission of the Council of National Defense began in June, 1917, the establishment of local committees of mediation and conciliation, composed of representatives of the employers, the workers, and the general public. In August of the same year, an important agreement was reached between the Government and the international unions engaged in American shipyards. Under this compact, the National Board of Adjustment was created as the final arbiter as to wages, hours, and conditions of work, and the unions agreed not to strike as long as the agreement was in force. The final step of the Government in the prevention of strikes was the creation of the National War Labor Board in April, 1918. The functions of this board were to be: to bring about the settlement of labor disputes by mediation and conciliation in all industries essential to the effective conduct of the War, to establish the necessary machinery for this purpose, and in case of failure of local mediation to carry on the arbitration themselves. The board was to be composed of five representatives of the employers' organizations, five of the A. F. of L., and two impartial chairmen, one for the employers and the other for the workers. The board served successfully as a means of settling disturbing labor troubles during the War. The year 1918 saw also the Altschuler award in the Chicago packing industry, which provided machinery for the settlement of grievances and under which the workers bound themselves not to strike pending the attempts at peaceful settlement of their disputes.

The very serious industrial troubles which broke out after the Armistice led to the calling by President Wilson of the First Industrial Conference on Oct. 6, 1919, for the purpose of considering the fundamental means of bettering the whole relationship between capital and labor. After its failure, the Second Industrial Conference was called, which presented on Dec. 28, 1919, a plan proposing the establishment of the National Industrial Tribunal and of Regional Boards of Inquiry and Adjustment. On Mar. 1, 1919, the conference issued its final report, in which it recommended as the best means for the prevention of industrial conflicts such agencies as had already been established in various trades; namely, shop committees and councils, work councils, etc., and, in case these failed, adjustment by the above-mentioned boards. The programme of the conference did not, however, find practical application, although mediation through the Government had proved rather successful during the War. Arbitration was resorted to with satisfactory results in a number of important disputes during 1921. A case in the packing industry was adjusted by a conference in Washington of the representatives of the employers and employees and the Secretary of Labor. The executive council of the International Typographical Union decided to maintain arbitration in the printing industry in New York and to submit its wage disputes to arbitration. On Jan. 1, 1921, the Pennsylvania Railroad system set up a joint reviewing committee "for the amicable settlement, by joint conference, of all controversial questions affecting the engine and train-service men."

A Court of Industrial Relations on the principle of compulsory arbitration was created in Kansas in 1920. The court affected a number of industries and was composed of three judges appointed by the governor. It was given wide powers, such as to make reasonable awards, investigate industrial conditions, bring suit in the Supreme Court of the State to enforce obedience to its orders, and to take over and run industries in case of emergency and limitation or actual suspension of production. Organized labor was strongly opposed to the court and serious difficulties arose from the conflict between the court and the trade unions in the State. In 1923 the United States Supreme Court unanimously held wage fixing by the Kansas court to be unconstitutional. (See KANSAS.) Machinery for the adjustment of labor disputes on the railroads was set up under the Transportation Act which was passed by Congress in February, 1920. The act provided for the settlement of controversies and grievances between the railroad workers and the managements by the establishment of the United States Railroad Labor Board, which was composed of nine members, appointed by the President. The board attempted unsuccessfully to arbitrate in the great strike of the railway shopmen in 1922.

The Railway Labor Act was passed by Congress and signed by the President, May 20, 1926. The new law abolished the Railroad Labor Board set up by the Transportation Act of 1920 and repealed the mediation, arbitration, and conciliation provisions of the Newlands Act of 1913. The machinery that is created is, briefly, this: Adjustment boards to deal with grievances or disputes over the application or interpretation of existing agreements are to be established by joint agreement. A Federal Board of Mediation is created, to be appointed by the President, with

the duty of intervening at the request of either party or on its own motion, in any unsettled labor dispute, including disputes that the adjustment boards have failed to settle, as well as disputes over changes in wages, rules, or working conditions which are not within the jurisdiction of the adjustment boards. If the Board of Mediation is unable to bring about an amicable adjustment between the parties, it is required to make an effort to induce them to consent to arbitration. Boards of arbitration are provided for when both parties consent to arbitration. Resort to a board of arbitration is voluntary, but its decisions are compulsory and enforceable. If a dispute is not settled by any of these methods, and if in the judgment of the Board of Mediation the dispute threatens substantially to interrupt interstate commerce, the board shall notify the President, who is thereupon authorized in his discretion to create an emergency board to investigate and report to him. After the creation of the emergency board and for 30 days after it has made its report to the President, no change, except by agreement, shall be made by the contending parties in the conditions out of which the dispute arose. Unlike the defunct Railroad Labor Board, the new Board of Mediation was to hand down no "decisions," but only to serve as an aid in bringing about voluntary agreements. The last-resort function of the emergency board is to enable the President to inform the public on which side to lay the blame for failure to reach an agreement.

Perhaps the most comprehensive means so far for the peaceful settlement of industrial disputes is found in the agreements between the Amalgamated Clothing Workers and the clothing manufacturers. Especially notable here is the Trade Board established in Chicago, consisting of two representatives of the union, two of the employers, and an impartial chairman. Practically all the decisions rest virtually with the chairman.

**Great Britain.** Due to the powerful organization of British labor, methods of arbitration have progressed further in Great Britain than in the United States. A great advance was made in the former country by the establishment of the Industrial Council, which was composed of 13 representatives of the employers, an equal number of representatives of the workmen, and Sir George Askwith as impartial chairman. The latter arbitrated in 1914 the strike of the unskilled workers near Birmingham. At the Treasury Conference of 1915, the trade-union officials and the Government concluded an agreement for the purpose of regulating the relations between employers and workers for the duration of the War. The compact stipulated that all disputes should be settled by conferences between the parties or, in case they failed to agree, by three other possible means of arbitration. The miners were the only ones who remained outside of this pact. The Treasury Agreement, however, did not prevent serious unofficial strikes during the remainder of the War. The establishment of the Joint Industrial Councils during the latter part of the War and immediately after the Armistice served effectively to preserve industrial peace in a great number of trades. Probably the most important measure, however, regarding the relations between capital and labor was the Industrial Courts Act of 1918. It created a standing Industrial Court, composed of independent persons and representatives of the employer and employees, all of them appointed by the Government. The court

is a permanent industrial tribunal and as such has settled a great number of disputes by making awards, the most important of which was the Dockers' Court of Inquiry early in 1920. Although the court has no power to compel compliance with its decisions, the number of awards repudiated by the losing side has been negligible. The most momentous single arbitration case in Great Britain was the Coal Commission of March, 1919, which was set up on the demand of the miners for the six-hour day, higher wages, etc. It consisted of six representatives of the miners, six of the mine owners, and an impartial chairman, and dealt with wages, hours, and nationalization of mines. The interim report on wages and hours was published in three parts. The part that called for the seven-hour day, and which was signed by the chairman and three representatives of the employers, was adopted by the Government. None of the reports on nationalization was put into effect. It was thought by many that with the trade boards, the Industrial Court, and the joint industrial councils, Great Britain had three effective agencies for the prevention of industrial disputes by arbitration; but on May 4, 1926, there came the calamitous General Strike, lasting eight days, and the continuance of the coal strike additional months, with disastrous effects upon the labor movement of England as well as upon her major industries. See STRIKES AND LOCKOUTS.

**LABOR BANKS, UNITED STATES.** That extension of the principle of coöperation, as dis-

cussed under that title, which led to the establishment by labor of cooperative banks did not take definite hold in the United States until 1920. The first bank in this country to be owned and controlled by a labor organization was the Mt. Vernon Savings Bank, Washington, D. C. (1920). In that year, also, the Brotherhood of Locomotive Engineers founded at Cleveland, Ohio, what was then said to be the only National bank in which depositors shared earnings. The success of this considerable venture (in 1928 it still had the largest total resources of any single labor bank in the United States) stimulated the establishment of similar institutions. The expansion of the movement in the succeeding years is shown by the accompanying table, from the *Monthly Labor Review* of the U. S. Department of Labor, October, 1928.

The labor bank is distinguished from the ordinary commercial bank chiefly in that (1) it is owned and controlled by labor; (2) it limits the dividend payable to stockholders to 10 per cent; (3) it pays a higher rate of interest on deposits (generally 4 per cent on savings, and 2 per cent on checking accounts above \$500), and computes interest from the first day; and (4) it pays to the depositor, over and above interest, dividends from its net earnings. The labor bank is chartered in the regular way, under State or Federal laws, and is subject to the usual strict examination. Control rests with the labor union (or unions) and its membership: (a) through possession of the majority

#### CONDITION OF LABOR BANKS AS OF JUNE 30, 1928

Name of bank and location	Capital	Surplus and undivided profits	Deposits	Total resources
Federation Bank & Trust Co., New York	\$ 750,000	\$ { 750,000 <sup>a</sup> 297,278 <sup>b</sup> }	\$19,036,393	\$21,168,585
Engineers National Bank of Cleveland	1,000,000	{ 859,856 <sup>b</sup> 350,000 <sup>a</sup> }	16,780,115	20,154,680
Amalgamated Bank of New York	650,000	{ 85,470 <sup>b</sup> 350,000 <sup>a</sup> }	9,837,670	11,209,688
Telegraphers' National Bank of St. Louis	500,000	{ 224,303 <sup>b</sup> 150,000 <sup>a</sup> }	6,755,030	7,718,383
Labor Coöperative National Bank of Paterson, N. J.	300,000	{ 35,782 <sup>b</sup> 50,000 <sup>a</sup> }	5,031,616	5,075,320
Brotherhood of Railway Clerks National Bank, Cincinnati	200,000	{ 43,794 <sup>b</sup> 151,822 <sup>a</sup> }	4,507,582	5,274,641
Mt. Vernon Savings Bank, Washington	400,000	{ 148,886 <sup>b</sup> 50,000 <sup>a</sup> }	3,730,431	4,374,575
Labor National Bank of Newark	250,000	{ 22,095 <sup>b</sup> 100,000 <sup>a</sup> }	3,626,281	4,004,412
Engineers' National Bank of Boston	500,000	{ 42,175 <sup>b</sup> 89,097 <sup>a</sup> }	2,833,020	3,732,132
Amalgamated Trust & Savings Bank, Chicago	200,000	{ 45,164 <sup>b</sup> 70,722 <sup>a</sup> }	3,129,408	3,493,885
Brotherhoods' Coöperative National Bank of Spokane	200,000	{ 70,722 <sup>b</sup> 61,540 <sup>a</sup> }	2,687,913	3,195,679
Brotherhood Coöperative National Bank, Tacoma, Wash.	200,000	{ 104,320 <sup>b</sup> 55,793 <sup>a</sup> }	2,677,757	3,122,879
Brotherhood Coöperative National Bank, Portland	200,000	{ 30,000 <sup>b</sup> 15,412 <sup>a</sup> }	2,287,024	2,763,149
Transportation Brotherhoods' National Bank, Minneapolis	200,000	{ 40,000 <sup>b</sup> 16,300 <sup>a</sup> }	2,396,009	2,743,804
Labor National Bank of Jersey City	200,000	{ 15,000 <sup>b</sup> 6,889 <sup>a</sup> }	2,105,277	2,709,095
Brotherhood National Bank of San Francisco	500,000	{ 53,804 <sup>b</sup> 10,500 <sup>a</sup> }	1,669,123	2,433,328
People's Coöperative State Bank, Hammond, Ind.	100,000	{ 8,786 <sup>b</sup> 22,500 <sup>a</sup> }	1,705,643	1,933,634
American Bank, Toledo	200,000	{ 11,142 <sup>b</sup> 10,000 <sup>a</sup> }	1,203,683	1,588,567
Brotherhood Bank & Trust Co., Seattle	250,000	{ 2,843 <sup>b</sup> 3,000 <sup>a</sup> }	911,954	1,201,954
Farmers' & Workingmen's Savings Bank, Jackson, Mich.	100,000	{ 951 <sup>b</sup> 5,000 <sup>a</sup> }	971,087	1,095,938
Nottingham Savings & Banking Co., Cleveland	75,000	{ 5,704 <sup>b</sup> 5,000 <sup>a</sup> }	798,717	895,693
Hawkins County Bank, Rogersville, Tenn.	50,000	{ 1,745 <sup>b</sup> 1,745 <sup>a</sup> }	722,261	826,065
Labor National Bank of Great Falls, Mont.	100,000	{ 1,745 <sup>b</sup> 1,745 <sup>a</sup> }	699,892	822,178
United Labor Bank & Trust Co., Indianapolis	112,500	{ 1,745 <sup>b</sup> 1,745 <sup>a</sup> }	658,222	810,144
Gary Labor Bank, Gary, Ind.	50,000	{ 1,745 <sup>b</sup> 1,745 <sup>a</sup> }	627,130	759,892
Labor Bank & Trust Co., Houston	100,000	{ 1,745 <sup>b</sup> 1,745 <sup>a</sup> }	423,878	528,888
Labor National Bank of Three Forks, Mont.	25,000	{ 1,745 <sup>b</sup> 1,745 <sup>a</sup> }	192,818	228,522
Brotherhood State Bank, <sup>d</sup> Spokane	25,000	{ 1,745 <sup>b</sup> 1,745 <sup>a</sup> }	159,891	192,563
<b>Total (28 banks)</b>	<b>\$7,437,500</b>	<b>\$3,606,614</b>	<b>\$98,165,834</b>	<b>\$114,717,673</b>

<sup>a</sup> Surplus. <sup>b</sup> Undivided profits. <sup>c</sup> Statement as of Apr. 24, 1928. <sup>d</sup> Statement as of Feb. 28, 1927.

of the voting stock of the bank; and (b) through union officials and other men in sympathy with labor, who constitute the majority of the officers and board of directors. The labor union itself, as an organization, operates the bank, assuming the usual financial liability to depositors. Business and administrative affairs are in the hands of experienced bankers, acting with the trade-union officials. The fact that labor leaders in the banks were not only legally responsible as bank officials but were also responsible to the labor organizations made for unusual care in choosing competent bankers to administer affairs, and so for conservative policies. The temptation to take risks was further lessened by the limitation on the number of shares to be owned by an individual, usually to three. Without any known exception, labor banks up to 1928 were having considerable financial success. Notwithstanding the limitation on dividends, the market value of labor-bank stocks was above par.

In addition to offering unusual advantages to the depositors and stockholders, the labor bank was a source of strength to the trade union. For one thing, it earned for the union, on its defense and insurance funds, a profit in excess of the interest that these funds ordinarily drew from commercial banks; and not only was it able to supply funds for the sound enterprises of other unions or coöperatives which might otherwise be left unaided, it was in a position to discriminate in granting its loans between employers who were favorable and those who were unfriendly to labor. Moreover, the existence of the labor bank weakened the pressure that commercial banks might exert on individual employers during strikes, by withholding credit. A number of the labor banks were depositories of State and city governments and members of the Federal Reserve system.

Toward the end of the period being surveyed, there were evidences to indicate that the labor banks were not increasing as rapidly as the sanguine originally believed they would. For one, organized American labor had become more and more conservative and was giving up a large part of its activities as entrepreneur; again, private bankers were not as hostile as they had formerly been. During 1926 and 1927, for example, the following labor banks were either sold to private interests or discontinued: Brotherhood of Locomotive Engineers' Coöperative Trust Company (N. Y.), Brotherhood Savings & Trust Co. (Pittsburgh), Brotherhood of Locomotive Engineers' Title & Trust Co. (Philadelphia), Brotherhood of Locomotive Engineers' Bank & Trust Co. (Birmingham, Ala.), and the Brotherhood State Bank (Kansas City). In this period, only two banks made their appearance, viz., Gary Labor Bank and the Brotherhood National Bank (San Francisco).

**LABOR LEGISLATION.** Although America's first labor law was enacted in 1813, when Connecticut set up an educational requirement for working children, and although the development has continued steadily since that time, by far the greater part of effective labor legislation is the fruit of the period since 1910.

A significant recent effort is the constitutional amendment passed by Congress in 1924, which, if it is accepted by three-fourths of the States (five States, Arizona, Arkansas, California, Montana, and Wisconsin, had done so by Jan. 1, 1929), will make it possible for that body to

enact laws regulating child labor throughout the country. This came after two attempts of the Federal Congress to restrict the labor of children, both of which were declared unconstitutional by the Supreme Court. See CHILD LABOR.

Beginning with 1912, fifteen minimum-wage laws were enacted and passed through a period of economic trial and judicial test until, in 1923, the United States Supreme Court found the District of Columbia law unconstitutional for women (see MINIMUM WAGE). There has been progress in the regulation of the form and method of wage payments and establishment of wage preferences and mechanics' liens.

There were at the beginning of 1929 only four States in the country—Alabama, Florida, Iowa, and West Virginia—that had no law whatever to regulate the hours of work for women (see HOURS OF LABOR and WOMEN IN INDUSTRY). Legal regulation of men's working hours has by no means been confined to public works and public utilities—although during the past twenty years many laws have been passed regarding hours in public employments. Legislation limiting the hours of men in dangerous private employments has made a considerable advance. Oregon recently moved on to the eight-hour day in the lumbering industry, but with a reciprocal provision that the new law goes into effect only after adjoining States have adopted the same restrictions. See HOURS OF LABOR.

The first accident-reporting law dates from 1886, but most of the scientific gathering of accident statistics is the work of the past twenty years. The first law requiring safety devices in factories was adopted in 1887, but it is only since about 1910 that universal progress has come in accident prevention. Mining codes also have been enacted or improved, while during the year 1924, the Industrial Commission of Utah, after a mine explosion at Castle Gate which took 172 lives, adopted a set of mine-safety regulations unique in its comprehensiveness and in its application of the best thoughts on the subject. Much public interest in industrial hygiene was manifested in the year immediately following 1910, and since then most of the States have adopted new regulations of factory sanitation and ventilation or improved their former laws.

The United States witnessed the successful operation of the Federal Employment Service for about a year and a half during the World War, and a subsequent decline in its effectiveness through enormously reduced appropriations. It has witnessed as well the establishment of many State public employment services and a considerable development in the regulation of private fee-charging bureaus. Three States, by specific law, have officially recognized the importance of long-range planning of public works to provide employment in periods of business depression. See UNEMPLOYMENT.

Another important development during the period since 1910 is the legislation providing accident compensation for those injured in the course of employment. By Apr. 1, 1929, fifty-one United States compensation laws had been passed, including the three Federal statutes. The legislation was in effect in all but four States (Arkansas, Florida, Mississippi, and South Carolina), since North Carolina adopted it early in 1929. Most of the older laws of the country have been liberalized in one way or another since

they were originally passed. See **WORKMEN'S COMPENSATION**. In addition, 41 States, between 1920 and 1929, voted to cooperate with the Federal government in the vocational retraining of industrial cripples.

As an outgrowth of the same social spirit, pioneer legislation in more than half-a-dozen States has established old-age pensions. See **OLD-AGE PENSIONS**. Mothers'-pension systems were in operation in 43 States, while 45 States had accepted the Federal appropriation for maternity protection offered by the Sheppard-Towner Act of 1921 by 1929. See **MOTHERS' PENSIONS** and **MATERNITY PROTECTION**.

The legislation affecting collective bargaining has not been of great importance. The power of the Kansas Court of Industrial Relations compulsorily to arbitrate conflicts between employers and employees was practically annulled by a United States Supreme Court decision. See **LABOR ARBITRATION**. A number of States during the World War and shortly after enacted laws defining and penalizing criminal syndicalism and sabotage; but several States also officially recognized trade unions and declared human labor is "not a commodity." See **TRUSTS**.

One of the outstanding developments has been in the field of labor-law enforcement and administration. All States now have some provision for the special administration of labor legislation, while most of them have some central body for the purpose. In numerous States, industrial commissions modeled after that of Wisconsin not only enforce the labor law but issue orders which have the compulsion of law, after the Legislature has laid down the general principles which the regulations are to follow. An industrial commission, which also makes constant investigations, is in a far better position to determine the detailed application of a statute than is a body of miscellaneous legislators meeting but once in two years.

The principle hindrances to labor legislation in the past have been (1) the opposition of business interests; (2) the after-war reaction; and (3) adverse court decisions. Fourteen times during the period 1914-1924, the United States Supreme Court decided cases affecting labor by four-to-five or by four-to-four decisions.

Helpful influences in labor legislation include (1) the more general spread of knowledge of the need and practicability of legal protection; (2) the development of effective scientific propaganda organizations such as the Consumers' League, the Child Labor Committee, and the American Association for Labor Legislation; (3) the more active participation of women in public activities; and (4) the application of Federal-State financial cooperation which had within three years after the Federal provision led to the adoption of vocational rehabilitation of industrial cripples by three-fourths of the States and the rapid extension of maternity protection in an even greater number of jurisdictions. By Jan. 1, 1929, only three States (Connecticut, Illinois, and Massachusetts) and the territory of Alaska, had failed to enter into the Federal-State cooperation in maternity protection; only seven States (Connecticut, Delaware, Kansas, Maryland, Texas, Vermont, and Washington) were not cooperating in rehabilitation of cripples. Only five States (Alabama, Georgia, Mississippi, New Mexico, and South Carolina) were without mothers'-pension laws.

A brief survey is sufficient to show how modern indeed is most of our labor legislation. Probably all of it is in need of improvement today, but considering the rapidity with which fundamental changes in legislation have spread over the country since 1910, the prospect seems favorable for future advances wherever the need is clear and the opportunities for public enlightenment are available. See **IMMIGRATION**.

**Supreme Court Decisions.** Decisions by the United States Supreme Court have shown an increasing tendency to overrule legislation for the protection of labor and to curtail labor's organized activities. In the later years, many important decisions were handed down by a closely divided court. A survey made by the United States Bureau of Labor Statistics of the decisions by the Supreme Court, in which cases affecting labor were involved, disclosed the fact that within 40 years there had been 21 cases decided by a vote of four to five or four to four; 13 of these, or nearly two-thirds of the total, falling within the ten years beginning with 1914. It appeared that members of the court were with increasing frequency unable to agree as to whether or not an act of legislation is "plainly and palpably, beyond all question, in violation of the fundamental law of the Constitution."

Many of the court's decisions in the early years of the decade 1914-24 were favorable to labor, particularly in the field of protective legislation, but in the later few years, measures of far-reaching importance to the welfare of wage-earning men and women were nullified by the opinions of a bare majority of the court.

Perhaps the most important favorable decisions of the Supreme Court during this period were those in favor of the constitutionality of workmen's-compensation laws. In giving its final assent to this form of protective legislation, the court took the advanced ground of upholding laws providing for compulsory and exclusive State funds for workmen's-accident insurance. In its decision sustaining the 10-hour day for factory employees in Oregon, the court for the first time recognized the power of a State to enact laws limiting the hours of work of men in private employment, as well as of women and children. In the *Adamsen* eight-hour-law decision of 1917, the court held that Congress had the power to limit the number of hours to eight for trainmen engaged in interstate commerce. A New York law prohibiting night work for women in restaurants was upheld, as was also a law of Oregon establishing a minimum wage for women and minors. See **MINIMUM WAGE**.

On the other hand, the Supreme Court in a third divided decision finally blocked the efforts of Congress to provide accident compensation for longshoremen and other local harbor workers under State laws. In two decisions, it nullified attempts by Congress to abolish child labor (see **CHILD LABOR**) and in another later decision which aroused widespread interest, it declared unconstitutional a Federal law providing a minimum wage for women and children in the District of Columbia.

Among the important decisions of the Supreme Court which tended to weaken organized labor in the field of collective bargaining were those in the so-called *Danbury hatters'* and *Arkansas coal-miners'* cases which established the principle that labor unions and their individ-



ual members are responsible, without limit, for the unlawful actions of the union officers and agents which they have in any manner authorized or sanctioned; the *Coppage v. Kansas* decision which declared unconstitutional a State statute aimed to prevent an employer from forcing his employee to agree not to join a trade union during his term of service; the *Hitchman Coal and Coke Company v. Mitchell* decision which held that where an employer has compelled all of his employees to sign a contract that they will not join any labor union, it is illegal to make any effort to organize them; the *Duplex Printing Company* decision in which the court clearly distinguished for the first time between "primary" and "secondary" boycotts, and declared that the Clayton amendment to the Sherman Anti-trust Law had not legalized the secondary form; the *United Mine Workers of America v. Coronado Coal Company* decision in 1922 which held that trade unions are suable in their own names—the first case of importance in America permitting a suit against an incorporated union.

The fact that an increasing number of far-reaching decisions of the Supreme Court in cases affecting labor had checked protective legislation and trade-union activities—and had been handed down by a closely divided court—made a political issue of the contention that the court is the chief obstacle to social progress in America and that action should be taken by Congress to limit the power of the court to pass upon the constitutionality of laws. See **LAW, PROGRESS OF THE.**

**LABOR LEGISLATION, AMERICAN ASSOCIATION FOR.** Founded in 1906, this national scientific membership society approaches social problems from the general welfare viewpoint. Its membership includes representatives of employers and employees, public officials, economists, social workers, and other public-spirited men and women. Its programme includes workmen's compensation, old-age pensions, weekly rest day, promotion of mine safety including rock-dusting, stabilization of employment and effective administration of labor laws. The Association, which is supported by voluntary contributions of members and friends, maintains an information service for its members, publishes special reports and the quarterly, *American Labor Legislation Review*, and holds conferences. Headquarters are at 131 East 23rd St., New York City.

**LABOR OFFICE, INTERNATIONAL.** See **LABOR ORGANIZATION, INTERNATIONAL.**

**LABOR ORGANIZATION, INTERNATIONAL.** One of the most significant and novel features of the Paris peace settlement of 1919 was the incorporation as Part XIII of the Treaty of Versailles of a special Labor Convention setting forth a chapter of principles for labor legislation and providing for the establishment of the permanent International Labor Organization. This labor section of the treaty represented a signal triumph for the cause both of internationalism and of labor. A commission on international labor legislation with 15 members, including such prominent leaders as Samuel Gompers, the president of the American Federation of Labor, and Vandervelde, the patriotic Belgian Socialist, was appointed by the Peace Conference in January, 1919, to formulate suitable treaty provisions for labor welfare and unemployment. The Commission made its report

on March 24. Following detailed consideration and revision by the Council of Four, this report was adopted on April 11. It consisted of two parts, one creating a permanent organization for international labor legislation and the second enunciating a veritable bill of rights for labor. Recognizing that the existence in the various countries of special circumstances arising from differences of climate, habits, and customs of economic opportunity and industrial tradition made strict uniformity in the conditions of labor difficult of immediate attainment, the essential methods and principles were affirmed to be: (1) Consideration of labor not as a commodity; (2) right of association for lawful purposes for both employers and employees; (3) payment of a wage adequate to maintain a reasonable standard of life; (4) adoption of an 8-hour day or 48-hour week; (5) adoption of a weekly rest of at least 24 hours, including Sunday whenever practicable; (6) abolition of child labor and continuation of the education and proper physical development of children; (7) equal remuneration for men and women for work of equal value; (8) equitable treatment in every country of all workers lawfully resident therein; and (9) adequate systems of inspection in which women should participate, to insure enforcement of protective regulations. These aims and purposes were sanctioned in the League of Nations Covenant (Article XXIII, Section A).

The machinery of the International Labor Organization as created by the Convention embraced two major organs, a periodic International Labor Conference and a permanent International Labor Office. The Conference, composed of four delegates from each member state, two appointed by the Government and one each by the most representative organizations of employees and workmen, respectively, was to meet at least once a year, to consider labor problems, to discuss standards of labor welfare, to debate feasible measures for the attainment and maintenance of these standards, and to formulate decisions either as conventions for ratification or rejection by the national parliaments of the world, or as recommendations to be submitted to and considered by these national parliaments or local legislatures. These conventions might then be executed by means of appropriate domestic legislation.

Up to July, 1929, the Labor Conference had met eleven times. The first meeting was held at Washington, D. C., Oct. 29–Nov. 29, 1919. Though the United States was not officially represented, 121 delegates from 39 other countries were in attendance. Germany and Austria were admitted to membership by a vote of 71 to 1. Six draft conventions and six recommendations were adopted; the most noteworthy achievement was an 8-hour-day convention. The other conventions dealt with unemployment, care of female workers in industry before and after childbirth, prohibition of nocturnal employment of women in industry, prescription of a minimum age of admission of children to employment, and the prohibition of night employment for children under 18. The second session was held at Genoa, Italy, in June, 1920, when 27 nations were represented by specialists competent to deal with conditions of maritime labor. Three conventions were adopted, dealing with seamen's employment agencies, payment of unemployment insurance in cases of shipwreck, and prescription

of a minimum age of 14 years for employment of boys at sea; recommendations also were made on employment insurance, enactment of national seamen's codes, and regulation of hours of work in the piscatorial industry and inland navigation. The Permanent Joint Maritime Commission was constituted to further the work of improving maritime labor conditions.

The third session of the Labor Conference held at Geneva, Switzerland, during October, 1921, dealt mainly with problems of agricultural labor. Strenuous French objections to any consideration of these problems as alien to the jurisdiction of the Labor Organization were overruled and subsequently the Permanent Court of International Justice at its first session in July, 1922, definitely established the competence of the conference. A whole series of conventions and recommendations were adopted dealing with labor in general and specifically extending to agriculture. Legislation had hitherto been restricted rather narrowly to urban industrial labor. These 1922 measures included limitation of hours of labor, unemployment insurance, improvement of working conditions, and protection of women and children.

The fourth annual meeting, at Geneva in October, 1922, adopted a recommendation calling for more adequate and accessible information regarding transit and migration of persons from one country to another. Also adopted for submission to the League of Nations was an amendment to Article 393 of the Treaty of Versailles; it elaborated and liberalized somewhat the governing body thereby set up to control the International Labor Office. The fifth session, held in October, 1923, was principally concerned with the general principles of the organization of factory inspection. At the sixth session, in June, 1924, great satisfaction was expressed at the steadily improving industrial conditions of Europe; but decision was made to extend the study of unemployment.

The seventh session, in 1925, dealt with international standards for workmen's compensation; the eighth in 1926, with inspection of immigrants aboard ships, and the ninth, the same year, with seamen; the tenth, in 1927, with health insurance and the minimum wage; the eleventh, in 1928, with minimum-wage-fixing machinery and the prevention of occupational accidents. Twenty-four draft conventions and 26 as commendations have been adopted.

The International Labor Office was subjected to the control of a governing body of 24 members appointed annually by the International Labor Conference; the 1922 amendment had proposed a body of 32 triennially selected members at least 12 of whom should be non-European. This body had the functions, first, of preparing the agenda of the conference; secondly, of conducting the correspondence and negotiations involved in the execution of its decisions; and thirdly, of making technical investigations and collecting and disseminating general information about labor conditions in all parts of the world. Organized first at London in January, 1920, the Labor Office, in July, 1920, was transferred to the seat of the League of Nations at Geneva; for the Labor Organization, although autonomous, was placed under the aegis of the League and is supported financially by grants of money made by the League Assembly. The first director of the Labor Office, who in 1929 was still in charge, was Albert Thomas, the

French Socialist and labor leader, who had been an exceedingly capable Minister of Munitions during the War. Under his able supervision, an administrative staff of experts, men and women from different countries, was recruited and trained and continues to function.

**LABOR ORGANIZATIONS.** See **TRADE-UNIONISM**.

**LABOR PARTY, AUSTRALIAN.** See **AUSTRALIA**.

**LABOR PARTY, BRITISH.** See **GREAT BRITAIN**; **SOCIALISM**, under *Great Britain*.

**LABRADOR.** A dependency of Newfoundland, and the most easterly part of the British North American mainland; area, 120,000 square miles; population, 4054 in 1927, as compared with 3965 in 1913. The leading activities of the population, mostly Eskimos and Indians with some whites, continues to be the fisheries and fur trapping. The Grenfell Mission among the whites, and the Moravian Brethren among the Eskimos to the north, continue to make life supportable for the population. The settlement of the long-outstanding boundary dispute between Canada and Newfoundland in this region resulted from the decision on the part of both governments in 1920 to submit the matter to the British Privy Council. A survey commission in December, 1920, revealed the importance of the contested region by the discovery of rich forest lands and mineral areas. The decision of the Privy Council was not rendered until March, 1927, when the boundary between Quebec and Newfoundland was definitely delimited. The line as finally determined was the watershed of the rivers flowing into the Atlantic Ocean, the coastal boundaries being from Blanc Sablon, on the south, to Cape Chidley, on the north. As a result of this decision, an estimated area of some 110,000 square miles was confirmed as under the jurisdiction of Newfoundland.

**LACQUERS.** See **CHEMISTRY, APPLIED**.

**LACRETELLE**, lá'kr'-tél', JACQUES DE (1888- ). A French psychological novelist who was born at Cormatin (Saône-et-Loire) and educated at the Lycée Janson-de-Sailly. In 1922 his *Silbermann*, the story of the persecutions of a Jewish boy in France, received the Prix Femina-Vie Heureuse. His other works include *La vie inquiète de Jean Hermelin*, memories of his childhood (1920); *La mort d'Hippolyte* and *La belle journée*, both short stories; *La Bonifas* (1925); *Lettres espagnoles* (1927); *L'âme cachée* (1928); and *Vie politique de Victor Hugo* (1928), *Silbermann* and *La Bonifas* were translated into English.

**LACROSSE.** Although lacrosse originated in Europe, it is in the Americas that the game is now making its greatest headway. Canada and the United States turn out the strongest teams, recruiting from various clubs and colleges. The growing popularity of lacrosse in the United States college world is evinced by the constantly increasing numbers of spectators attracted to these contests. The high schools of the larger cities also are showing much enthusiasm for this sport. Johns Hopkins University of Maryland has almost invariably presented the most powerful lacrosse teams. The lacrosse competitions at the Olympic Games (q.v.) of 1928 aroused considerable interest.

**LADD, ANNA COLEMAN** (MRS. MAYNARD LADD) (1878- ). An American sculptor, born in Philadelphia, Pa., who studied in Paris

and Rome and in 1915 was elected an associate member of the National Society of Sculptors. One of her masters was Charles Grafly, an able technician. In most of her figures, Mrs. Ladd is concerned with the proper disposition of light by means of the modeling. Her work has strength and originality, and her preference is for imaginative subjects. She has, however, executed many successful portrait busts (Duse, Pavlova, Ethel Barrymore) and bas-reliefs. Among her sculptures are the "Spirit of Serbia," exhibited at the Rhode Island School of Design, "Bronze Lady," at the Gardner Collection, Boston, "Wind and Spray," in the Borghese Collection at Rome, and the fountains in the Boston Public Gardens. During 1918, Mrs. Ladd conducted a studio in France for portrait masks for mutilated soldiers.

**LADRONE ISLANDS.** See PACIFIC OCEAN ISLANDS.

**LAESSELE, ALBERT** (1877- ). An American sculptor, born in Philadelphia, Pa., who studied at the Spring Garden Institute, Drexel Institute, and the Pennsylvania Academy of Fine Arts. He was a pupil of Charles Grafly and studied in Paris with Michel Béquine. He is best known for his studies of animal life, of which good examples are exhibited in the Pennsylvania Academy of Fine Arts, where three of his sculptures, "Turtle and Lizards," "Blue-Eyed Lizard," and "Chanticleer" are to be found, and from which he received the Fellowship Prize (1915), the Widener Memorial Gold Medal (1918), and the Fellowship Gold Medal (1923). He was awarded the gold medal of the Philadelphia Sesquicentennial in 1926. At the Carnegie Institute, Pittsburgh, his study, "Heron and Fish," is on exhibition. Other examples of his work are "Victory" and "Turning Turtle," at the Metropolitan Museum, New York, "Penguins," at the Philadelphia Zoological Gardens, "The Bronze Turkey" and "Billy," at the Philadelphia Art Club, and three small bronzes, "An Outcast," "Locust and Pine Cone," and "Frog and Katydid," at the Peabody Institute, Baltimore.

**LA FARGE, CHRISTOPHER GRANT** (1862- ). An American architect (see VOL. XIII). From 1910 to 1915, he was a member of the firm of La Farge & Morris, and in 1918 became investigator and assistant general manager of the United States Housing Corporation in Washington. Since Jan. 1, 1926, he has been a member of the firm of La Farge, Warren & Clark, New York City. He was an associate of the National Academy and was formerly president of the Architectural League of New York. He was also a member of the Advisory Board of the School of Architecture of Princeton University and of the Advisory Council of the School of Architecture of the Massachusetts Institute of Technology. He was made honorary M. F. A. by Princeton in 1921.

**LAFAYETTE COLLEGE.** A college and school of engineering for men at Easton, Pa., founded in 1826. The enrollment grew from 580 in 1914 to approximately 1000 in the autumn of 1928; the faculty from 50 to 95; and the library from 30,000 to 71,000 volumes. The productive funds were increased from \$770,960 in 1917 to \$2,800,000 in 1928. An endowment campaign in 1920 netted \$1,000,000. The Helen H. P. Manson chair of Biblical literature, \$200,000 from Fred M. Kirby and the Fred Morgan Kirby professorship of civil rights, the Simon

Cameron Long professorship in chemistry, \$500,000 from John Markle for a mining engineering building with its endowment, and Easton Hall, a dormitory for freshmen, a gift of the citizens of Easton, were added during the period. Nine acres were acquired as an addition to the campus in 1922, and a new gymnasium was completed in 1924 as a memorial to Lafayette men in the War. William Mather Lewis, LL.D., succeeded John Henry MacCracken, Ph.D., LL.D., as president in 1927.

**LA FOLLETTE, ROBERT MARION** (1855-1925). A United States Senator from Wisconsin (see VOL. XIII). He was reelected successively from 1910 to 1923, and during that entire period dominated the Republican Party in Wisconsin. He actively opposed, in 1916-17, all war preparations, and an attempt was made by the Legislature of Wisconsin to deprive him of his office as Senator (see WISCONSIN). In spite of these efforts, he was reelected. Although he was absent from the Senate on account of illness for a large portion of the time in the latter part of the decade, his influence in the Senate continued to be great. In 1922, 1923, and 1924 he was able, by his control of so-called blocs in both the Senate and the House, to decisively affect the functioning of those bodies. In the Senate, he led a group of members from the Western States who, in 1923-24, on account of the small margin between the Republican and Democratic membership, held the balance of power, and were able to affect legislation to a large extent. This was true also in the House, where the Republican Representatives, from Wisconsin and other States, who were controlled by him were able, by combining with the Democratic Party, to overthrow attempts of the Republican majority to pass important measures and to modify others. In 1924 he announced his candidacy for the Presidency on an independent ticket. He had previously organized the so-called Conference for Progressive Political Action, composed chiefly of insurgent Republicans and Democrats and some members of the Farmer-Labor Party. At a convention in Cleveland, in July, 1924, he was nominated for President. He also received the nomination of the Socialist Party, although he had never been identified with Socialism. In the election, he received the electoral vote of Wisconsin. See UNITED STATES, *History*.

**LA FOLLETTE, ROBERT MARION, JR.** (1895- ). A United States Senator, born at Madison, Wis. From an early age, he was closely associated with his father, U. S. Senator Robert M. La Follette (see above), in political matters, becoming his secretary at Washington and serving as secretary of the Senate Committee on Manufactures, of which the elder La Follette was chairman. After his father's death in 1925, he was elected to the Senate, being the first son of a U. S. Senator to take his father's seat by direct succession. In 1928 he was reelected for the term ending in 1935. He succeeded his father as chairman of the Senate Committee on Manufactures, and is a member of the committees on commerce, foreign relations, Indian affairs, and mines. He is editor of *La Follette's Magazine*.

**LAGERLÖF, Håger-läf (OTTLIA LOVISA) SELMA** (1858- ). A Swedish novelist (see VOL. XLII). She took an active interest in communal affairs and served as a member of the municipal council in her native county, Wärm-

land, where with the aid of the Nobel Prize, she restored the ancestral estate. Her later publications include: *Astrid* (1914); *Dunnungen*, a comedy (1914); *En Emigrant* (1915); *Silvergrievan* (1915); *Drimman* (1916); *The Outcast* (1918); *Ingmarssönerna* (1919); *Zachris Topelius* (1920); *Marbacka, the Tale of a Manor* (1922); *The General's Ring* (1925); *Charlotte Lovensköld* (1925); and *Anna Svärd* (1928). Consult *Selma Lagerlöf*, by M. Kristensen (1918).

**LA GORCE**, PIERRE-FRANÇOIS-GUSTAVE DE (1846- ). A French historian, born at Vannes and educated at the Institution Saint Jean (Douai) and the University of Paris. He began his career in 1872, at Rocroi, as *juge suppléant*, and held positions subsequently at various places, but resigned in 1880, finding that he could not follow his conscience in judging cases. He then practiced law for several years, but finally gave that up, too, and devoted himself thereafter to historical studies. In 1895 he was awarded the *Prix Alfred Née* by the French Academy, and in 1900 the Academy's *Grand Prix Gobert*. In 1907 he was admitted to the Académie des Sciences Morales et Politiques, and in 1914 was elected to the French Academy, being received in 1917. He belonged to the "classic" school of historians. His works include, besides contributions to periodicals: *Histoire de la seconde République française*, 2 vols. (1887); *Histoire du second Empire*, 7 vols. (1894-1906); *Histoire religieuse de la Révolution française* 5 vols. (1909-23); *Paul Guirard* (1911); *À travers la France chrétienne* (1920); *Saint Vincent Ferrier* (1924); and *Louis XVIII* (1926).

**LAHM**, FRANK PURDY (1877- ). An American airman, born at Mansfield, Ohio, and educated in France and at the United States Military Academy. He won the first Gordon Bennett Balloon Race at Paris in 1906 and the National Balloon Race in 1911. Also, he organized the Army Air Service in the Philippine Islands. He was on active duty in France, 1917-19, being in charge of the Air Service of the 2d Army, A. E. F. (1918-19). In 1922 he was air-service representative of the War Department. He was 9th Corps Area Air Officer, 1924-26, and in September, 1926, was appointed brigadier general for a period of four years, and at the same time assistant to the chief of Air Corps, to organize and command the Air Corps Training Centre.

**LAIRD**, IARD, JOHN (1887- ). A British philosophical scholar, Regius professor of moral philosophy at the University of Aberdeen. He was educated at Edinburgh, Heidelberg, and Cambridge universities, and then became professor of Dalhousie University, Nova Scotia (1912), and later held the chair of logic and metaphysics at Queens's College in the University of Belfast (1913-24). He was Mills lecturer for 1923-24 at the University of California. His writings include *Problems of the Self* (1917); *A Study in Realism* (1920); *The Idea of the Soul* (1924); *Our Minds and Their Bodies* (1925); and *A Study in Moral Theology* (1926).

**LAKE ERIE COLLEGE**. An institution for the higher education of women at Painesville, Ohio, founded in 1898. Student enrollment in the fall of 1928 was 190; in the same year there were 33 members of the faculty, 20,000 volumes in the library, and productive funds amounting to \$793,890.45. The college received a number

of gifts since 1924, including the Helen Rockwell Morley Memorial Music Building costing \$271,000, an organ for the same costing \$47,000, a central heating plant and laundry costing \$111,000, and \$312,000 for increasing the endowment. President, Vivian Blanche Small, Litt.D., LL.D.

**LAKE FOREST COLLEGE**. A coeducational institution, with Presbyterian affiliations, founded at Lake Forest, Ill., in 1857, as Lind University, and known since 1876 as Lake Forest College. The student body increased from 230 in 1923 to 385 in 1927-28 and the faculty from 21 to 33 members in the autumn of 1928. Reid Memorial Library in 1928 contained 38,500 volumes; the productive endowment of the college was \$1,521,847; and the income from endowment for 1927-28 was \$89,429. Between 1914 and 1928, the curriculum was adapted to modern demands, including the development of courses in business administration leading to the degree of bachelor of business administration. In 1928 there were 26 buildings in use on the campus, including 11 houses for professors, four of which were constructed in 1927. President since 1920, Herbert McComb Moore, D.D., a graduate of the Class of 1896.

**LAMARCK THEORY**, MODERN VIEWS OF. See HEREDITY.

**LAMB**, ARTHUR BECKET (1880- ). An American chemist, born at Attleboro, Mass. He was graduated from Tufts College in 1900, and studied chemistry at Harvard, Leipzig, and Heidelberg. He was instructor in electrochemistry at Harvard (1905-06), assistant professor and professor of chemistry at New York University (1906-12) and at Harvard (since 1912). During the World War, he was the chief of the chemical defense division of the Chemical Warfare Service with the rank of lieutenant colonel and later was also director of the Nitrogen Research Laboratory (1919-20). His original studies have been varied and include researches on such topics as the dehydration of periodic acid, isomensin in conimoric acid derivatives, the potential of iron, equilibria among cobaltamines, removal of carbon monoxide from air, and active charcoal, on all of which he has published the results of his investigations. In 1917 he became editor of the *Journal of the American Chemical Society*. He is a member of the National Academy of Science and various chemists' societies.

**LAMB**, HORACE (1849- ). A British mathematician (see Vol. XIII). He retired from his Owens College and University of Manchester professorship in 1920. He was Copley Medalist in 1924 and president of the British Association in 1925. He is the author of *Higher Mechanics* (1920).

**LAMKIN**, VEL WALTER (1877- ). An American public-school official. He was born at California, Mo., graduated at Clinton (Mo.) Academy, and studied at the University of Missouri. He taught in the public schools of Clinton (1897-1906); was chief clerk and high-school inspector of the Missouri State Department of Education (1907-09), and served as county superintendent of schools for Henry County, Mo. (1909-15). He was State Superintendent of Public Schools in 1916-18, and in 1919 transferred his activities to the Federal Board of Vocational Education, first as chief of the division of rehabilitation and later as director. Since 1921 he has been president of the North-

west Missouri State Teachers College at Maryville. In 1928 he was president of the National Education Association.

**LAMME, BENJAMIN G.** (1864-1924). An American electrical engineer, born on a farm near Springfield, Ohio, and educated at the Ohio State University. He was one of the four greatest electricians of his time, ranking with Edison, Steinmetz, and Tesla. Beginning with the Westinghouse Company in 1889 at \$30 a month, he became its chief engineer in 1903. He had been but six months in the employ of the company when he had designed the double-reduction-gear railway electric motor. Later, he devised the great "umbrella" generators which made possible the use of the power of Niagara Falls, the high-tension system of power transmission, the alternating-current system, and many other outstanding inventions. He was also a great teacher, and inspired many investigators throughout the world. In 1923 the Ohio State University awarded him the Joseph Sullivan Medal. During the World War, he represented the American Institute of Electrical Engineers on the Naval Consulting Board and was chairman of the board's inventions committee. He was the author of *Electrical Engineering Papers* (1919). His autobiography, edited by Mansfield Dudley, appeared in 1926.

**LAMONT, ROBERT PATTERSON** (1867- ). An American manufacturer and Secretary of Commerce. He was born at Detroit, Mich., was graduated in civil engineering from the University of Michigan, and worked as an engineer on the World's Fair grounds at Chicago (1891-92). For five years, he was secretary and engineer for a firm of contractors. He then engaged in manufacturing, becoming president of American Steel Foundries in 1912, and later chairman of the board of the Griffin Wheel Company. In the World War, he was commissioned major in the National Army and later became chief of the Procurement Division, Ordnance Department, at Washington with the rank of colonel. In March, 1929, he was appointed Secretary of Commerce in President Hoover's cabinet.

**LAMONT, THOMAS WILLIAM** (1870- ). An American banker, born in Claverack, N. Y. He was graduated from Harvard in 1892, and for a time was engaged in newspaper work. From 1903 to 1909, he was secretary and treasurer and vice president of the Bankers' Trust Company. He joined the firm of J. P. Morgan & Co. in 1911 and was also a director and official in many important financial corporations. During the Peace Conference in Paris, he was one of the chief financial advisers of the American delegation. He also took a prominent part in the discussions on reparations held in London in July and August, 1924, and in Paris in the spring of 1929. During 1912-25 he served as an overseer at Harvard University.

**LANCHESTER, HENRY VAUGHAN** (1863- ). A British architect. Privately educated, he commenced practice in 1889 and in the course of his career drew plans for the Cardiff City Hall and Courts; the Wesleyan Central Hall, Westminster; the Council Hall, Lucknow, India; and Leeds University. He also made the town-planning schemes for Delhi, Madras, Rangoon, and Zanzibar. He was editor of *The Builder* (1910-12), vice president of the Royal Institute of British Architects (1913 and 1927), and president of the Town Planning Institute (1922-23). He published a number of works on town planning.

**LAND BANKS.** See AGRICULTURAL CREDIT. **LAND GRANT COLLEGES.** See AGRICULTURAL EDUCATION; AGRICULTURAL EXTENSION.

**LANDIS, KENESAW MOUNTAIN** (1866- ). An American jurist (see VOL. XIII). He served as judge of the Northern District of Illinois from 1905 to 1922, resigning in the latter year to accept the position of commissioner for the American and National Leagues of Professional Baseball Clubs, and National Association of Professional Baseball Leagues. In 1927 he investigated charges of betting on games brought against two leading players, Cobb and Speaker, and exonerated both of those veterans. In 1921 he acted as arbiter of building-trade disputes, fixing the wage of all classes of building trades in Chicago.

**LAND RECLAMATION.** See RECLAMATION. **LAND.**

**LANDSBERGER, IANTS'BERK-ER, ARTHUR H.** (1870- ). A German writer, born at Berlin and educated at the universities of Berlin, Greifswald, Munich, Heidelberg, and Paris. He spent some years in traveling and in 1907 joined Georg Brandes, Hugo von Hofmannsthal, Prof. Werner Sombart, Prof. Richard Muther, and Richard Strauss in the establishment of the magazine *Morgen*, which during its comparatively brief existence was at the head of German periodical literature. He is the author of *Das Kind mit den vier Müttern* (1911); *Iliss* (1916); *Lache, Bajazzo* (1916); *Die neue Gesellschaft* (1917); *Frau Dirne* (1918); *Wie Satan starb* (1919); *Miss Rockefeller filmt* (1920); *Was die Nacht mir zuträgt* (1920); *Gott Satan, das Ende des Christentums* (1923); *Lachendes Asien, Fahrt nach dem Olen* (1924); *Asiaten* (1926); and some novels of varying merit.

**LANE, FRANKLIN KNIGHT** (1864-1921). An American cabinet officer (see VOL. XIII). He was appointed Secretary of the Interior by President Wilson, in 1913, and during his tenure took an active part in many important measures, and was considered one of the most efficient members of the cabinet. He gave especial attention to the conservation of public resources. He retired from office on Mar. 1, 1920, on account of ill health. Shortly after, he became vice president of the Pan-American Petroleum and Transport Company. His letters were published in 1922.

**LANE, RALPH NORMAN ANGELL.** See ANGELL, NORMAN.

**LANE, SIR (WILLIAM) ARBUTHNOT** (1856- ). A British surgeon, born at Fort George, New Brunswick. He received his medical degree from Guy's Hospital Medical School, London, later becoming a surgeon to the hospital. He became widely known for his operative treatment of fractures, his cleft palate operation, and for his researches into intestinal obstruction, constipation of mechanical nature, and autointoxication and his operative treatment of these conditions. He advocated with great persistence and originality his theory of the uselessness of the colon and its general harmfulness. He has published monographs on the treatment of fractures, cleft palate, and intestinal obstruction.

**LANG, COSMO GORDON** (1864- ). Archbishop of Canterbury and Prelate of the Order of St. John of Jerusalem. He was educated at Glasgow University and Balliol College, Oxford. After studying at the Inner Temple in London (1883-89), he entered the church and was curate



at Leeds (1890-93). He was fellow and dean of divinity at Magdalen College, Oxford (1893-96), served as vicar of St. Mary's, the Oxford University Church (1894-96), and as vicar of Portsea (1896-1901). He was created Bishop of Stepney in 1900, was canon of St. Paul's Cathedral (1901-08), and in the latter year became Archbishop of York. He was particularly noted for his work and preaching in industrial centres. He visited the United States in 1918, received degrees from many universities, and in 1923 the Royal Victorian Chain. On the resignation of Archbishop Davidson of Canterbury, he was elected in his place and installed on Dec. 4, 1928. His publications include *The Miracles of Jesus as Marks of the Way of Life* (1900); *The Parables of Jesus* (1906); *The Opportunity of the Church of England* (1906).

**LANGDON, STEPHEN HERBERT** (1876- ). An American Assyriologist. He was born in Michigan and studied at the Michigan State University, at Union Theological Seminary in New York, at Columbia University, the Sorbonne and Collège de France in Paris, in Leipzig, and in Oxford. He was deacon of the Church of England in Paris, 1905, and after 1908 was Shillito professor of Assyriology at Oxford. In 1923-27 he was director of the Oxford and Field Museum Expedition in Mesopotamia. He is the author of *Annals of Assurbanipal* (1905); *Les Inscriptions du Wadi Brisa* (1905); *Babylonia and Palestine* (1906); *La Syntaxe du Verbe Sumerien* (1907); *Sumerian and Babylonian Psalms* (1909); *A Sumerian Grammar and Chrestomathy* (1911); *Neu-Babylonische Königsinschriften* (1912); *Babylonian Liturgies* (1912); *Tammuz and Ishar* (1914); *Sumerian Epical and Liturgical Texts* (1915-17); *Le Poème Sumerien du Paradis* (1919); *Sumerian Liturgies and Psalms* (1919); *Babylonian Wisdom* (1922); *Excavations at Kish* (1925); *Babylonian Penitential Psalms* (1927); and was editor of *Babyloniaca* (Paris, 1908-14); *Oxford Editions of Cuneiform Texts* (1923- ); *Babylonian Epic of Oration* (1924).

**LANGE, Jǎng'ē, CHRISTIAN LOUIS** (1869- ). A Norwegian peace advocate, born at Stavanger. He has been general secretary of the Interparliamentary Union since 1909, and was Norwegian delegate to the second Hague Peace Conference (1907), and to the League of Nations (since 1920). In 1921 he won the Nobel Peace Prize. He wrote *Histoire de l'Internationalisme*, 1 to 1648.

**LANGFELD, HERBERT SIDNEY** (1879- ). An American experimental psychologist. He was born at Philadelphia, Pa., and was educated at Haverford College and the University of Berlin. In 1902-03 he served as Second Naval Attaché at the American Embassy in Berlin. He returned to academic work and in 1910 became associated with the department of psychology at Harvard University. In 1919-22 he was director of the experimental laboratory there. Since 1924 he has been professor and director of the psychological laboratory at Princeton. His publications include, in addition to experimental monographs, a manual, *Experimental Psychology* (1916), and an empirical study of aesthetics, *The Aesthetic Attitude* (1920).

**LANGLEY AÉRODROME.** See **AÉRONAUTICS**.

**LANGLOIS, Jǎng'glwǎ, CHARLES VICTOR** (1863- ). A French historian, born at Rou-

en, and educated at the Lycée St. Louis in Paris and the École des Chartes, where he was graduated with honors. In 1901 he was appointed professor at the Faculty of Letters of the University of Paris, and in 1912 director of the national archives. He was admitted to the Institute of France in 1917 as a member of the Academy of Inscriptions and Belles Lettres, and was also a member of the Commission for the Literary History of France. He wrote *Le Règne de Philippe III* (1887); *Les Archives de l'histoire de France*, with H. Stein (1891); *Introduction aux études historiques*, with C. Seignobos (1897, trans. 1912); *Manuel de bibliographie historique* (2 vols., 1896, 1904); *Histoire du moyen âge* (1901); *L'Inquisition* (1902); *Questions d'histoire et d'enseignement* (1902); *La société française au XIII<sup>e</sup> siècle* (1903); *Histoire de l'écriture en France* (1905); *La connaissance de la nature et du monde au moyen âge* (1911); *Un mémorialiste parisien: Laurent Boucher* (1912); *Les hôtels de Clisson, de Guise et de Rohan-Soubise au Marais* (1922); and *La vie en France au moyen âge de la fin du XII<sup>e</sup> au milieu du XIV<sup>e</sup> siècle* (3 vols., 1925-27).

**LANGMUIR, IRVING** (1881- ). An American chemist, born at Brooklyn, N. Y. He was graduated from Columbia University and later studied in Göttingen, where he received his Ph.D. in 1906. He was instructor in chemistry at Stevens Institute of Technology, but in 1909 became research chemist to the General Electric Company in Schenectady, N. Y., where he devoted much attention to the development of gas-filled tungsten lamps and electron discharge apparatus, and devised a high-vacuum pump. These won for him the Nichols Medal of the New York Section of the American Chemical Society in 1915 and in 1920, the Hughes Medal of the Royal Society of London in 1918, the Rumford Medals of the American Academy of Arts and Sciences in 1920, and the Perkin Medal in 1928. During the World War, he made special experiments on devices for the detection of submarines at the Naval Experiment Station at Nahant, Mass. See **CHEMISTRY**.

**LANGUAGE.** See **ETHNOLOGY**; **PHILOLOGY** **MODERN**.

**LANKESTER, Jǎn'kes-tér, SIR EDWIN RAY** (1847-1929). An English naturalist and zoologist (see Vol. XIII). He was Linnean Medalist in 1920. His later works included *The Diversions of a Naturalist* (1915); *Science and Education* (1919); *Secrets of Earth and Sea* (1920); and *Great and Small Things* (1923). He continued his work as editor of the *Quarterly Journal of Microscopical Science* until his death Aug. 15, 1929, in London.

**LANS'DOWNE, HENRY CHARLES KEITH PETTY-FITZMAURICE, FIFTH MARQUIS** (1845-1927). An English public official. He served as minister without portfolio in the coalition cabinet in 1915-16. At the end of the World War, he took a moderate attitude in regard to peace, and published several proposed plans, parts of which were incorporated in the Treaty of Versailles.

**LANSING, ROBERT** (1864-1928). An American lawyer and public official (see Vol. XIII). Shortly after assuming the office of counselor for the State Department, he succeeded William Jennings Bryan as Secretary of State, holding that office until 1920, when he was dismissed by President Wilson for alleged usurpation of the latter's authority by calling cabinet meet-

ings during the latter's illness. He was a member of the American Commission to Negotiate Peace at Paris in 1919 and published *The Big Four and Others at the Peace Conference* (1921); *The Peace Negotiations* (1921); and *Notes On Sovereignty* (1921). Following his retirement from the cabinet, he practiced law in Washington.

**LANSING-ISHII AGREEMENT.** See JAPAN, under *History*.

**LANSON, lān'sōn', GUSTAVE** (1857- ). A French literary critic (see VOL. XIII), formerly a professor at the Sorbonne. He was director of the École Normale Supérieure from 1919 to 1927, when he became honorary director. In November, 1917, he was one of the founders of the Ligue Civique, an organization politically of the Right. His later writings include *Culture allemande, humanité russe* (1915); *Trois mois d'enseignement aux États Unis* (1917); *La démocratie américaine* (1918); *Esquisse d'une histoire de la tragédie en France* (1920); and *Méthodes de l'histoire littéraire* (1925). He edited, with an introduction, variations, and notes, *Premières méditations poétiques* of Lamartine (1917), and the second series of *Les grands écrivains de la France* (6 vols., 1922-25). Consult *Mélanges offerts par ses amis et ses élèves à M. Gustave Lanson*, which has a bibliography (1922), and *Le victorieux XX<sup>e</sup> siècle*, by Pierre Moreau (1925).

**LAOS.** See FRENCH INDO-CHINA.

**LAPARRA, RAUL** (1876- ). A French composer, born at Bordeaux. He studied at the Paris Conservatoire under Fauré and Massenet, and won the Prix de Rome in 1903 with a cantata, *Ulysse*. He gained international reputation with his opera *La Habañera* (Paris, 1908; Boston, 1910; Metropolitan Opera Company, 1924). His other operas are *Peau d'âne* (Bordeaux, 1899), *La Jota* (Paris, 1911); *Le Joueur de Violon* (Paris, 1925); and two not yet produced (1929), *Amphitryon* and *L'Aventure pittoresque*. His also wrote incidental music to *El Conquistador*, an orchestral suite, *Un Dimanche Basque*; a violin sonata, and interesting pieces for piano.

**LAPLACE, ERNEST** (1861-1924). An American surgeon, one of the pioneers of the new antiseptic surgery. He was born in New Orleans and received his degree in arts at Georgetown University, Washington, D. C., in 1880, and his degree in medicine at Tulane University, New Orleans, in 1884. Going abroad for postgraduate work, he studied under the direct supervision of Pasteur, Lister, and Koch. He was appointed professor of surgery at the Medico-Chirurgical College, Philadelphia, in 1892 and later held the same chair in the graduate school of medicine of the University of Pennsylvania. He became well known through his forceps for intestinal anastomosis, his extensive writings on antiseptics and intestinal surgery, and his work in brain surgery.

**LARBAUD, VALÉRY** (1881- ). A French novelist, one of the leaders of the modern psychological school. He was a cosmopolitan, writing from a world, rather than a national point of view. *A. O. Barnabooth*, his diary, begun in 1902, finished 10 years later, and published in 1913, presented perhaps his most famous character. Larbaud's other works include *Enfantines*, stories (1918); *Samuel Butler*, a lecture (1920); *Fernina Marquez*, for children (1920); *Amants, heureux amants*, three stories

(1923); and *Jaune, bleu, blanc*, essays (1927). In 1924 *A. O. Barnabooth* was translated into English.

**LARDNER, RING W.** (1886- ). An American writer, born at Niles, Mich. He served as a sports writer for many different newspapers, including the *Chicago Tribune* and *Boston American*. His books include *Bib Bal-lads* (1915); *You Know Me, Al* (1915); *Gullible's Travels* (1917); *Own Your Own Home* (1917); *Treat 'Em Rough* (1918); *The Real Dope* (1918); *The Young Immigrants* (1919); *The Big Town* (1921); *How to Write Short Stories* (1924); *What of It?* (1925); *The Love Nest* (1926); *The Story of a Wonder Man* (1927); *Roundup* (1928). As a fictionist, he was first known for his humorous and slangy genre sketches of the sporting world, his baseball players and Broadway hangers-on being depicted with fidelity and kindliness. His *How to Write Short Stories* and *Roundup* seemed to be approached in the same light spirit, but the stories which composed the volumes indicated a matured artistic attitude and a seriousness of purpose, in the handling of his typical American lower middle-class characters, that at once prompted critics to group the works with Master's *Spoon River Anthology* and Anderson's *Winesburg, Ohio*.

**LARMOR, lār'mor, SIR JOSEPH** (1857- ). A British physicist (see VOL. XIII). Continuing his work as Lucasian professor of mathematics at Cambridge, he was awarded the Royal Society's Royal Medal in 1915 and the Copley Medal in 1921. He served as Unionist member of Parliament from Cambridge University (1911-22), as president of the London Mathematical Society (1914-15), and was made an associate of numerous foreign learned societies, including the National Academy of Sciences of the United States. He wrote *Mathematical and Physical Papers* (1929).

**LARSEN, JOHANNES ANKER.** See ANKER-LARSEN, JOHANNES.

**LARSEN-TODSEN NANNY I.** (1884- ). A celebrated Swedish dramatic soprano, born in Hagby. She received her musical education at the Conservatory of Stockholm (1900-06), and, after her most successful début at the Royal Opera there, she was engaged permanently in 1907. She won a great reputation as one of the foremost living interpreters of Wagner. When the Bayreuth Festival was resumed in 1924, she sang Brünnhilde in the *Ring* cycle. She made her American début at the Metropolitan Opera House as Brünnhilde in *Götterdämmerung* (Jan. 31, 1925) and has sung there since.

**LASKI, lās'kē, HAROLD J.** (1893- ). An English political philosopher, born at Manchester and educated at New College, Oxford. He was lecturer in history at McGill University (1914-16), and at Harvard University (1916-20). In 1920 he returned to England to join the London School of Economics, in 1923 he became political science reader at the University of London, and in 1926 professor of political science there. He was vice chairman of the British Institute for Adult Education, on the council of the Institute of Public Administration, and political science lecturer at Magdalene College, Cambridge (1922-25). His works on the problem of sovereignty in the modern state, with their insistence on political and economic decentralization—*The Problem of Sovereignty* (1917); *Authority in the Modern State* (1919); and *Found-*

*dations of Sovereignty* (1921)—were considered most important contributions to the political thought of the period. He showed his familiarity with the history of political thinking in his masterly summary, *Political Thought from Locke to Bentham* (1920). He edited a volume of *Burke's Letters* (1922); *Morley's Essay on Burke* (1924); the *Autobiography of J. S. Mill* (1924); and the *Library of European Political Thought* (1926-28). Besides writing for various periodicals, he wrote *A Grammar of Politics* (1925) and *Communism* (1927).

**LASKY, JESSE L.** (1880- ). An American moving-picture producer, born at San Francisco, Calif. He was educated in the schools of San Francisco and was for a time reporter on newspapers in that city. After experiences in Alaska and Hawaii, he entered the theatrical business with Henry B. Harris in New York City. In 1914 he organized and became president of the Jesse L. Lasky Feature Play Company, which afterward merged as the Paramount Famous Lasky Corporation, having large studios at Hollywood, Calif. He was one of the most important figures in the development of moving pictures.

**LASSITER, WILLIAM** (1867- ). An American soldier, born in Petersburg, Va. He was graduated from the United States Military Academy in 1889, and was commissioned in the artillery, in which he served during his military career. He saw service in the Spanish-American War and was on duty with the General Staff in 1911 and 1913. He was commissioned brigadier general in the National Army in 1917, and major general in the following year. In 1922 he became major general in the Regular Army. He was chief of artillery for the 1st Corps in 1918 and served in the same capacity with the 2d Army later in the same year. He was commander of the 32d Division in 1918-19, and was chief of artillery of the 3d Army in April, 1919. In August of that year, he returned to the United States. From 1921 to 1923, he was assistant chief of staff in charge of operations and training. He was appointed commander of the Panama Division in 1923 and succeeded General Pershing as head of the Tacna-Arica Plebiscite Commission in 1926. Since 1927 he has commanded the 6th Corps Area, with headquarters at Chicago.

**LATANE, JOHN HOLLADAY** (1869- ). An American educator, born at Staunton, Va. He graduated from Johns Hopkins University in 1892 and after serving as acting professor of history and economics in the Baltimore City College, he became master of history and English at the Military College at San Rafael, Calif. From 1898 to 1902, he was professor of history and economics at Randolph-Macon Woman's College, and from 1902 to 1913, professor of history at Washington and Lee University. In 1913, he became professor of American history and head of the Department of History at Johns Hopkins, and in 1919, dean of the college faculty. He was a member of many learned societies and wrote *From Isolation to Leadership* (1918); *The United States and Latin America* (1920); and *History of American Foreign Policy* (1927).

**LATERAN TREATY, THE.** With the advent of 1929 came rumors that quiet negotiations had been going on for some time looking to a settlement of the Roman question and to a treaty of reconciliation between the Holy See and Italy

in which there could be recognition of the sovereignty and independence of the Pope and a concordat between the Holy See and Italy. This was confirmed by Cardinal Gasparri, the Papal Secretary of State, in an address on February 7, to the members of the diplomatic corps accredited to the Holy See. The treaty of conciliation settling the 60-year-old controversy between the Church and the Italian state was signed in the Lateran Palace, on Feb. 11, 1929, by Cardinal Gasparri, acting for Pope Pius XI, and Premier Mussolini, on behalf of King Victor Emmanuel, thus marking one of the most momentous events in the history of the Papacy.

According to the official communiqué issued for publication on February 12, the settlement consisted of three documents: (1) a treaty eliminating the Roman question, (2) a concordat regulating the conditions of religion and the church in Italy, and (3) a convention systematizing the financial relations between the Vatican and Italy arising out of the 1870 events.

The preamble of the treaty reaffirms the principle in the first article of the "Italian kingdom's constitution" by which Catholicism is the only state religion in Italy. The treaty creates a new state called the "City of the Vatican" in which territory the Holy See is the sole authority. The piazza in front of St. Peter's is in Vatican territory, but will continue open to the public and be subject to the Italian police. Italy will provide the Vatican City with a railway station, and direct communication to the other states by telegraphic, telephonic, wireless, and postal services. Persons with permanent residence in the Vatican City will be Papal subjects. Immunities will be granted to church dignitaries, persons attached to the Papal Court, and Vatican officials. Territorial immunities will be provided for patriarchal basilicas and other ecclesiastical edifices outside the Vatican City. Italy recognizes the Vatican's right to send to foreign countries and to receive diplomatic representatives according to international law. Italy will accredit an ambassador to the Vatican, and the Vatican a nuncio to Italy. The Italian government will (at the Vatican's request) see to punishment in Italy of crimes committed within the Vatican City. The Vatican will deliver to Italy refugees accused of acts considered criminal by the laws of both state and city.

A clause declares that the Vatican will remain extraneous to temporal competitions with other states unless the conflicting parties appeal to its mission of peace. The Vatican territory will always be considered neutral and inviolable. The Vatican recognizes the Italian Kingdom under the dynasty of the House of Savoy, and Italy recognizes the state of the Vatican City under the Supreme Pontiff's sovereignty. Italy recognizes marriage as a sacrament regulated by canon law in its relation to civil law. Cases concerning nullity and dissolution of marriages celebrated but not consummated are reserved to ecclesiastical courts. The Vatican consents to civil authorities' judgment on separations. Religious instruction in elementary and secondary schools is made compulsory. Italy recognizes organizations forming part of Italian "Catholic action," which must be nonpolitical.

The Vatican accepts in the financial convention 750,000,000 lire in cash and 1,000,000,000 lire in Italian state bonds bearing 5 per cent interest as indemnity for loss of temporal power in 1870 and for its consequences.

The new Vatican state is about 160 acres in extent. On March 13, the Italian Council of Ministers approved a bill for the fulfillment of the treaty, and, on May 27, King Victor Emmanuel signed the bills giving effect to its stipulations. On July 25, Pope Pius XI passed through the bronze doors of St. Peter's to take part in an elaborate Eucharistic procession, and thus ended the voluntary imprisonment within the Vatican confines that had extended from 1870, through the pontificates of his four predecessors, Pius IX, Leo XIII, Pius X, and Benedict XV. It is estimated that 100,000 spectators filled St. Peter's Piazza to witness this ceremony. See ITALY, under *History*; ROMAN CATHOLIC CHURCH.

**LATEUR, FRANK.** See STREUVELS, STIJN.

**LATOURETTE, KENNETH SCOTT** (1884- ). An American clergyman and professor, born at Oregon City, Oreg. He was graduated from Yale in 1906 and was a member of the faculty of that university until 1909. For a time, he served as traveling secretary of the Student Volunteer Movement of Foreign Missions, and from 1910 to 1917 was a member of the faculty of the College of Yale in China. In 1914 he became a member of the faculty at Reed College, Portland, Oreg., afterward going to Denison University. In 1921, he became professor of missions at Yale and since 1927 his professorship has included Oriental history. He was ordained to the Baptist ministry in 1918. Among his works are *History of Early Relations Between the United States and China, 1784-1844* (1917); *Development of Japan* (1918); *The Christian Basis of World Democracy* (1919); *A History of Christian Missions in China* (1928).

**LATTER-DAY SAINTS, CHURCH OF JESUS CHRIST OF.** A religious body commonly known as the Mormon Church, existing chiefly in the United States. It was organized Apr. 6, 1830, at Fayette, N. Y., by Joseph Smith, whom his followers credit with having discovered, through a divine revelation, a set of plates, buried in a hill, from which by a special power received from God, he translated the text of the Book of Mormon, the special sacred book of the church. The Mormon articles of faith include belief in God, Jesus Christ, and the Holy Ghost, the punishment of men for their own sins, the atonement, divine authority, baptism, laying on of hands, prophecy, salvation for the dead, the Bible "as far as it is translated correctly," the common virtues, and obedience to constituted authorities. The membership of the church is chiefly in the Mountain States, owing to the early migrations of Mormons and their final settlement in Utah.

The administrative divisions of the church are known as the stake, ward, branch, and mission. A stake comprises wards and branches, and is directed by a presidency of three. A ward is frequently a part of a city, and is directed by a bishop and two counselors. The branch, similar to the ward, is directed by an elder. In 1928 the church consisted of 101 stakes, 939 wards, and 72 independent branches. Membership increased from 403,388 in 1916 to about 640,000 in 1928. The work of the church is directed by the Melchizedek priesthood, which numbered 73,382 members in 1928; there is also an Aaronic, or junior priesthood, which totaled 72,899 in 1928. Missionary work also has generally increased. In 1928 there were 11 missions in the United States, with 1267 missionaries,

and about 87,500 members, and approximately 28,000 members in Europe, and 14,000 in the Pacific Islands. In the United States, there are seven temples, while the church maintains Brigham Young University (q.v.) at Provo, Utah, six junior colleges, two collegiate institutes, one high school, and 72 seminaries, small schools adjoining high schools and providing special religious instruction. The auxiliary bodies include a women's relief society numbering about 61,820, which cares for the poor and sick, Sunday schools with 257,967 pupils, including 26,250 officers and teachers. The two Mutual Improvement Associations, composed of young persons, had an enrollment of 101,444. The primary association had 106,993 children under 14. Religious classes had an enrollment of 59,574. The church holds general conferences in the first week of April and of October of each year, at Salt Lake City, Utah.

**LATTER-DAY SAINTS, REORGANIZED CHURCH OF JESUS CHRIST OF.** This is the smaller of the two bodies known as Latter-day Saints, bearing the distinctive term "Reorganized" as part of its church title. Founded in Wisconsin in 1852, it represents a reorganization of some of the scattered congregations which developed among the Latter-day Saints after the death of Joseph Smith in 1844. The Reorganized Church is identical in faith and religious practice with the original church, but rejects polygamy as inconsistent with Joseph Smith's revelation. Its membership increased from 73,899 in 1915 to 103,174 in 1928; the number of ministers from 6136 in 1923 to 6732 in 1928; the number of Sunday schools from 637 in 1915 to 714 in 1928; and pupils from 33,062 to 37,841. The denomination maintains Graceland College at Lamoni, Iowa, the Institute of Arts and Sciences at Independence, Mo., homes for the aged, a sanitarium, a powerful radio broadcasting station at Independence, Mo., and publishes the *Saints' Herald*, a weekly periodical. Its headquarters are at Independence, Mo., and the president is Frederick M. Smith, a grandson of the founder, who succeeded his father, Joseph Smith, in 1914.

**LATVIA.** One of the Baltic Succession States arising out of the War, formerly part of the Russian Empire. It is made up of the former Russian province of Courland, the southern half of the former province of Livonia, and the western part, amounting to about one-third, of the former province of Vitebsk. It covers 25,402 square miles of territory, with a coast line of 338 miles and a total frontier line of 1040 miles, bounded by Estonia on the north, Russia on the east and Lithuania on the south. Total population, 2,552,000 in 1914; 1,883,180 at the census of 1928. Capital, Riga. For administrative purposes, it is divided into four districts. The census of Jan. 1, 1925, divided the population in to the following ethnic groups: 75.6 per cent Letts, 12.3 Russians, 4.5 Jews, 2.5 Germans, and 0.9 Poles. Of the total population, 76 per cent was rural. Density per square mile was 74.5. By occupations: 56 per cent agricultural, 18 per cent in industry, and 6 per cent in trade. About 60 per cent of the population was Protestant. Catholic majorities were to be found in Latgale and parts of Courland. Population of chief towns, 1925: Riga, 337,700 (517,552 in 1913 and 330,997 in 1928); Libau, 60,702; Dvinsk, 40,640; Mitau, 28,321; Windau, 16,384.

**Production.** Latvia is primarily an agricultural country, although in recent years there has been a strong trend toward industrialization. The area and production of the principal crops in 1927 were as follows: Wheat, 145,000 acres, 2,636,000 bushels; rye, 633,000 acres, 10,189,000 bushels; barley, 458,000 acres, 5,975,000 bushels; oats, 754,000 acres, 12,205,000 bushels; potatoes, 211,000 acres, 26,358,000 bushels; flax and linseed combined, 156,000 acres, 46,965 pounds of flax and 655,000 bushels of linseed. In the same year, there were 967,000 cattle, 535,000 swine, 1,128,000 sheep, and 369,000 horses. At the end of 1926, there were 2732 industrial enterprises employing 49,672 workers. The total value of industrial production in 1926 was \$59,226,000. Among the chief industries are food, drink, and tobacco, wood-working, chemical, textile, metal working, and paper and printing. Latvia has virtually no mineral resources.

**Trade.** The volume of trade is growing year by year, as shown by the following comparison:

Year	Imports (In lats; 1 lat = \$0.193)	Exports
1921 .....	70,697,355	29,264,991
1922 .....	107,370,110	101,992,006
1923 .....	211,872,025	161,929,052
1927 .....	221,245,682	249,987,549

The chief articles of import in 1927 consisted of: semi-manufactured goods, i.e., wool and woolen yarn, iron and steel products, hides and leather, petroleum; manufactured goods, i.e., cotton and woolen goods, machinery, implements; foodstuffs, i.e., grain and flour, sugar, herrings, tobacco. Chief among commodities exported were: lumber, other wood materials, flax and flax tow, precious metals, butter. By countries of origin, 1927 imports were distributed as follows: Germany, \$19,044,000; United Kingdom, \$5,086,000; Lithuania, \$1,406,000; Netherlands, \$1,444,000; Poland, \$2,793,000; Russia, \$3,542,000. Main countries of destination of exports: United Kingdom, \$14,437,000; Belgium, \$4,587,000; Germany, \$11,252,000; France, \$945,000; Russia, \$724,000. The United States bought \$1,317,000 worth of Latvian products and supplied goods valued at \$1,054,000.

**Transportation.** Length of railroads, 1850 miles (1927). Number of locomotives, 326; freight cars, 5682; passenger cars, 671. On June 30, 1927, Latvia's shipping included 88 vessels of 100 tons or more with a total gross tonnage of 88,782. This represented quite a long stride toward restoration of the country's pre-war merchant fleet, which on Jan. 1, 1914, comprised 59 steamers of 77,626 registered tons, and 274 sailing and motor vessels of 49,093 tons, but which by the end of 1921 had decreased 75 per cent, or to 34,021 tons. Vessels entering Latvian ports in 1927: 4041 of 1,761,000 net tons capacity; cleared, 4047 of 1,760,000 tons.

**Finance.** For the year 1928-29, the budget balanced at 164,110,000 lats. The state debt at the beginning of 1928, was 84,110,000 lats, of which 28,404,000 lats were due the United States. There were in circulation, Dec. 31, 1927, 70,963,000 lats. On Nov. 1, 1922, the Bank of Latvia, in which the Government was the chief stockholder, was opened. In June, 1922, the lat (\$0.193) became the unit of currency, and has remained continuously at par since that time.

**Education.** In 1927-28 there were 1904 elementary schools with 157,206 pupils and

7542 teachers. There were 122 secondary schools with 22,066 pupils. By the census of 1920, it was established that 70 per cent of the population could read. National minorities are taught their native languages in government schools. In 1919 the Riga Polytechnic was raised to be the Latvian University. In 1927-28 there were 7561 students and 320 instructors.

**History.** Early in 1918, as a result of the uncertainty engendered by the Russian Revolution and the threatening gestures of the peasants, German forces were invited by the Baltic barons to occupy Latvia. The Bolshevik troops were compelled to retire, and German troops invested the country. A German Army of Occupation was allowed to remain even after the Armistice, for the Allies were not yet prepared to guard the country against Russia. (See BALTIC PROVINCES.) On Nov. 18, 1918, however, independence was declared, and a government, controlled by the moderate, or peasant, elements set up. Bolshevik troops at once invaded the new state, captured Riga early in January, 1919, expelled the Latvian government, and set up a Soviet government. War was waged intermittently throughout the year, the chief Latvian force being a Baltic *Landwehr*, officered by Germans. In May, the Bolsheviks were driven from Riga, but the fear of German preponderance made the native Letts seek aid from the Allies. The Ulmanis government (the peasant parties) was recognized and an Englishman was placed in charge of the *Landwehr*, which thus became the official Lettish force.

Latvia became a battleground as a result of the Allied determination to attack Russia by way of the Baltic provinces, and not until 1920 did the Letts succeed in clearing their territory of foreign troops. On Aug. 11, 1920, then, the Russo-Latvian Treaty was signed at Riga. Its main provisions were: an ethnographic frontier for Latvia; a large timber concession to Latvia; nonliability for Russian state debts; disarming of anti-Bolshevik troops in Latvia; free transit for Russian goods across Latvian territory; payment to Latvia of 4,000,000 gold rubles. Then, after recognition by the Supreme Council, Latvia was admitted to the League of Nations on Sept. 22, 1921.

The Constituent Assembly, called in 1920, completed a national constitution on Feb. 15, 1922. The Parliament (*Sacima*) elected by universal suffrage and based on proportional representation, which chooses the state President, was provided for. The Prime Minister, in turn, was to be designated by the state President. The first Parliament, elected on Oct. 7, 1922, was controlled by a Social Democrat bloc, with the peasant and minority parties in the opposition. (Of the last, there were no less than 17 distinct groups having a total of 41 members. A new government formed June 10, 1923, was supported by a coalition of the Peasants' League, Democrats of the Centre, and Right Socialists, with the Premiership held by the head of the Peasants' League.

The second Parliament was elected in October, 1925, and at its meeting in November it reflected Jan Chakste for his second three-year term as President. Chakste died on Mar. 14, 1927, whereupon Parliament, on April 8, elected Gustave Zemgals to be Latvia's second President. The Conservative, Peter Junaszewski, became Prime Minister on Jan. 14, 1928, after the fall of a Socialist-Populist coalition. The elections of



Oct. 7, 1928, however, in which there were 44 political parties in the field, went against the Government, and Junaszewski therefore resigned, to be succeeded, on November 30, by Hugo Celmins, an Agrarian.

The Latvian government adopted a paternalistic attitude, especially toward the farmers, and the country prospered. Nevertheless, there was considerable discontent. Communist activities were rife, particularly in 1927 and 1928. In the first half of November, 1927, the police arrested several members of the Comintern of Latvia, who possessed written instructions from Moscow. On July 24, 1928, a number of Communists were court-martialed for treason and given long sentences at hard labor. An offer made by Russia to exchange these prisoners for Latvian political prisoners in Russia was refused. Then, a general strike was called for Aug. 22, 1928, in protest against the closing of the offices of extremist unions because of their plots against the Latvian constitution and government. A vigilant police and a drenching downpour cooled the ardor of the strikers and made the attempt look farcical. Again, on Nov. 13, 1928, an attempt was made by extreme radicals to assassinate President Zemgals, but the police frustrated the scheme.

Despite such happenings, the influence of Russia in Latvia was quite strong, and in September, 1927, a commercial treaty was signed by the two countries, whereby, among other things, they set up a dual control of the international flax market. This and other manifestations of an *approchement* with the Bolsheviks have served to act as a check upon the organization of a contemplated Baltic Confederation among Russia's succession states. There were almost a score of Baltic conferences between 1920 and 1929, and the movement for confederation was led by M. Meirovics, a Latvian Foreign Minister; but the latter's death in September, 1925, postponed, if it did not prevent, the fruition of the project. Meanwhile, ties have been strengthened between Latvia, Finland, Estonia, Poland, and Lithuania by a series of commercial and trade treaties. Moreover, on Jan. 16, 1927, Latvia and Estonia signed a draft convention for a customs union and general coordination of their economic and social legislation.

**LAUDER, SIR HARRY MACLENNAN** (1870- ). A Scottish singer and comedian (see VOL. XIII), who was knighted in 1919. He is the author of *Harry Lauder's Logic* (1917); *A Minstrel in France* (1918); *Roamin' in the Gloamin'*, an autobiography (1928).

**LAUSANNE CONFERENCE AND TREATY.** See PEACE CONFERENCE AND TREATIES; TURKEY, etc.

**LA VALLÉE POUSSIN, CHARLES DE.** See VALLÉE POUSSIN, CHARLES DE LA.

**LAVEDAN, la've-dān', HENRI LÉON ÉMILE** (1859- ). A French author, best known for his plays (see VOL. XIII). His later works include *Les grandes heures* (6 vols., 1915-21); *Dialogues de guerre* (1916); *La famille française*, a survey (1917); *La belle histoire de Geneviève*, a play (1919); a series entitled "Le chemin du salut" which includes *Irène Olette* (1920), *Gaudias* (1921), *Panteau* (1923), and *Madame Le soir* (1925), all excepting the first being in two volumes; *Lydie* (1921); *Catherine* (1922); *Monsieur Gastère* (1926), and *Monsieur Vincent* (1928), the last three being plays. He sometimes wrote under the pseudonym of Manchecourt.

**LAVIS, FRED** (1871- ). An American railroad engineer, born in England. After attending St. Luke's Middle Class School at Torquay, Eng., he went to the United States at the age of sixteen. He held minor positions as an engineer in New England and Cuba and then engaged for 15 years in railroad location and construction in the United States, Mexico, Central America, and South America. In the building of the Pennsylvania Railroad tunnels into the City of New York, he was resident engineer and after their completion in 1909, he practiced as a consulting engineer (1909-28), specializing in the economics of transportation, finance, and location and construction of railroads. He was chief engineer of the Argentine Railway Company, consulting engineer to the Bolivian government, and consulting engineer to the American International Corporation during that period. In the years 1924-28, he devoted most of his time to the design and construction of New Jersey's super-highway through the congested areas in Jersey City and Newark, to connect with the Holland Tunnel under the Hudson River to New York. In 1911 Mr. Lavis examined the properties now forming a part of the International Railways of Central America for the National City Bank of New York and became consulting engineer for the directors of that organization in 1926. In 1928 he was made president of the International Railways. He wrote the following books: *Railroad Location, Surveys and Estimates* (1906); *Subway Construction in New York* (1915); *Railway Estimates* (1917); and *Instructions to Locating Engineers* (1919).

**LAW, THE RT. HON. ANDREW BONAR** (1858-1923). A British statesman (see VOL. XIII). On the formation of the first Coalition Cabinet in 1915, he was appointed Secretary of State for the Colonies and in the first Lloyd George ministry in December, 1916, he became Chancellor of the Exchequer. Owing to the constant absence of the Prime Minister during 1916-19, he acted as leader of the House during that period, and was also a member of the War Cabinet. In 1919 he was the plenipotentiary to the Peace Conference. In the same year, he became Lord Privy Seal and leader of the House, positions which he resigned in 1921, along with the leadership of the Unionist Party. In 1922 he headed the Conservative revolt from the Coalition Cabinet, contributed largely to the victory of the Conservative Party in October of that year, and was chosen Prime Minister. He resigned on account of ill health in May, 1923, and died on October 30 of the same year.

**LAW, INTERNATIONAL.** See BLOCKADE.

**LAW, PROGRESS OF THE.** Law may be said to be the totality of rules prescribed by the proper authority for the regulation of society. One of the inherent qualities of law is its stability. There is a practical reason for the rigidity of positive law. The common law is a barrier against arbitrary decisions of the judiciary. Safety demands certainty in the administration of law, but the doctrine of *stare decisis* and the form of precedent are not alone based upon the assumption that individualization is unwise; society postulates a body of legal rights and duties which are predictable, vested interests which are determinable and fixed.

It does not follow, however, that the law is a static and unchangeable picture. Law must possess a considerable degree of rigidity, but it also possesses elasticity and adaptability in or-

individual activities by law are found in the interpretation of the recent statutes passed by New York and New Jersey.

New York, by statute, forbade the resale of theatre tickets at an advance of more than fifty cents above the box-office price. This statute was passed to protect the public against extortionate prices and was premised upon the assumption that a theatre was a place of public amusement, was affected with a public interest, and, therefore, could be controlled in the matter of the resale price of tickets.

This statute was declared unconstitutional by the United States Supreme Court in 1927, the majority judges denying the assertion that a theatre was a public business and arguing that the statute regulating the resale of tickets in an enterprise fundamentally private could not be constitutionally enacted. A strong dissent by four justices emphasized the contrary view that public opinion, crystallized into a statute, should not be dismissed upon the shadowy ground of liberty of contract.

Again in 1928, a New Jersey statute, regulating the fees charged by employment agencies in obtaining employment for applicants, was declared unconstitutional. Here, also, the divergent views of the constitutionality of legislation among the members of the Supreme Court may be clearly noted. Mr. Justice Sutherland, writing the opinion of the court, rejected the contention that employment agencies are "affected with a public interest." That abuses exist in the operation of these agencies was conceded, but these evils, while sufficient to justify regulation of employment agencies, would not permit regulation of the fees to be charged by these agencies.

Against this view, the minority of judges stressed the necessities of the persons seeking employment, their inability to bargain on equal terms with the employment agencies, and the prevalence of legislation seeking to correct these evils.

This survey indicates that the predominant view of the Supreme Court at the present time (1929) is to distinguish sharply between public and private business, to resist the entry of excessive regulations in the border-line enterprises, and to enunciate as a controlling principle of constitutional law the paramount right of individuals to contract without meddlesome interference by State or Federal governments.

**Property Rights.** The conservation of the right of property is clearly within the purview of the due-process clause of the Constitution. This right, however, is not absolute, but may be partially or even completely extinguished when the public interest requires it. The most striking example of the relativity of property rights, excluding the right of eminent domain, may be noted in the operation of the Eighteenth Amendment prohibiting the manufacture and sale of intoxicating liquors. This amendment automatically prevented the use of property and instrumentalities for the forbidden purposes and thereby materially lessened the value of these properties without compensation. Similar laws and statutes restricting or prohibiting the sale of food products have been held to be constitutional since they were passed to safeguard the public health. A familiar restriction is the "blue sky" law which conditions the sale of securities without a State license. Laws regulating the height of buildings, "zoning" laws, and ordinances prohibiting or taxing the use of land for billboards,

all of which have been declared to be constitutional, are modern illustrations of the lawful invasion of the individual's property rights.

An interesting illustration of the constitutionality of a statute which seriously qualifies the property rights of the individual is found in the so-called cedar-rust statute of Virginia. This statute was passed authorizing the State to order the owners of red cedar trees to cut the same down, when infected with cedar-rust. Cedar-rust is an infectious plant disease in the form of a fungoid organism and originated in cedar trees, without, however, injuring them. The cedar-rust was transmitted to apple trees and worked great damage. No provision was made in the Virginia statute for compensating the owner of the cedar trees for the full value of the trees cut down.

The question considered by the United States Supreme Court in construing the constitutionality of the Virginia cedar-rust statute was whether the State could destroy one class of property without adequate compensation therefor, when the destruction was necessary to protect another class of property. It appeared that the apple trees of Virginia, in the judgment of the Legislature, were of greater value to the public than the cedar trees. The Supreme Court decided that the preponderance of public interest in the preservation of the apple trees carried with it the necessary right to order the destruction of the cedar trees.

Another recent illustration of the power of the legislature to qualify the property rights of an individual is found in the zoning laws generally passed by municipal and town legislatures. A recent ordinance of the village of Euclid, Ohio, excluded all industries from a certain area of this village, without reference to their harmless or harmful character. The Supreme Court of the United States, reviewing this zoning law, held that it was constitutional even though industries were totally excluded from a given area in the village. If the validity of the legislative classification for zoning purposes is fairly debatable, the legislative judgment will not be disturbed by the courts. In the Euclid case, it is admittedly a difficult matter for the Supreme Court to determine definitely that the exclusion of all industry from a given area is *per se* unreasonable. This typical decision is in accord with the general policy of the courts to uphold zoning laws fixing the heights of buildings, the materials to be used, and the user of the buildings after erection. Problems of health and fire risk are inevitably involved in the erection of these structures and are proper subjects for legislative action provided only that the legislative action is not arbitrary or unreasonable.

**Equal Protection of the Laws.** The Fourteenth Amendment, in addition to its provision establishing and guaranteeing due process of law, provides that all persons within the jurisdiction of the State shall be accorded "equal protection of the laws." This important phrase secures equal treatment to all persons in the enjoyment of their rights and privileges. Equal protection does not prevent the State from classifying portions of the people according to their particular relations, but this classification must be based upon some real difference which separates the class affected from the other groups in the social order. This constitutional guarantee was originally incorporated to secure to the colored race, then recently emancipated,

the complete enjoyment of their freedom, but the Amendment is not confined to racial inequalities. Within its original purpose may be noted the cases that consider the constitutionality of legislation which establishes separate schools for white and colored children, separate coaches and stations in railroad service. These statutes have been validated on the ground that equality of laws does not necessitate intermixture of the races socially, provided that both races are given similar accommodations; but when a State passed a law prohibiting a colored person from buying property in a white district, and imposed the same restrictions upon a white person purchasing property in a colored section, the Supreme Court held that this provision, although aimed to lessen racial strife, exceeded the power of the State and violated the guarantee of equal protection of the laws.

Laws that classify distinct groups in the community are valid provided that the distinction is not arbitrary or unreasonable. For instance, the State may pass special regulatory statutes controlling insurance companies, banks, grain elevators, and mines. Such legislation may impose various forms of licenses, different rates of taxation, and varied modes of control without offending the equal protection clause. The employer-employee relation has been especially subject to particular legislation. Laws control hours of labor, working conditions, and safety appliances; but arbitrary discrimination will be inhibited in industrial legislation. In a recent case, the Supreme Court held a statute of Arizona to be unconstitutional which prohibited the use of injunctions in labor disputes, although a vigorous dissent to this decision was registered by four justices.

**Police Power of Government.** The police power inherent in government balances and limits the liberty of the citizen for the common good. The boundary of the police power is shadowy and uncertain. It sometimes includes a consideration of the limits of legislative power, sometimes a discussion of the conflict of State and Federal authority, and frequently the vague definition of the public welfare and individual right. Police power lies at the base of all those laws which curtail the freedom of contract, regulate the conduct of business, impose restrictions upon the use of property, and protect the health and safeguard the morals of the citizenry.

This necessary power of government is broad and flexible. It was recently invoked to curb the property rights of landlords during the housing shortage by the passage of emergency rent legislation. Congress was exercising the police power when it passed the temporary wage scale for railroad employees in connection with the Adamson Eight-Hour Law. The States also are possessed of a similar power which the Federal government must respect within its proper limits. The dividing line between the State and Federal police power is sometimes rather uncertain. The Congress may not, under the guise of taxation or regulation of interstate commerce, usurp the police power of the State. An important application of this principle of the separateness of the police power may be seen in the child-labor cases. In these cases, Congress attempted to bar from interstate commerce in the first case, and to tax in the second case, the products of child labor in the States. Obviously, the primary purpose was not to reg-

ulate commerce or to tax, but simply to reach out and to control interstate affairs. Both statutes were declared to be unconstitutional as an invasion of State sovereignty.

The strong stand of the Federal judiciary against the covert entry and domination of State business by Congressional acts is wise and necessary. The palpable need of child-labor laws is generally conceded; but the duality of our scheme of government negatives the right of Congress to infringe upon the reserved police power of the States to accomplish a worthy end. If this pronounced trend toward centralization were to continue, local government would become a mere name. The Federal government could through the extension of the power to regulate commerce virtually dominate the remote activities of the State. These excursions into States' rights have reached the peak, and the attitude of the Supreme Court gives support to the belief that further encroachments will not be successful.

The police power of the State, however, is not without limits even in its local environment. The exercise of the police power must bear a tangible relation to the governmental power and a due recognition of individual rights. Thus, a State may lay a tax upon or forbid the manufacture and sale of obnoxious and harmful foods such as oleomargarine, or the use of benzoate of soda in nonfermented beverages. A wide latitude even to the point of caprice has seemingly been allowed in State legislation; but the line against excessive and arbitrary prohibition is still drawn, although the separation is often difficult to define. The German language cases, decided in 1923, illustrate the possible misuse of police power by the State. Several States passed laws forbidding the instruction in any foreign language of any children under a certain age or school grade. Without questioning the power of the State to compel attendance and to make reasonable regulations for all schools, the Supreme Court held that the restriction was beyond the power of the State and violative of individual rights. A more extreme form of the same radical exercise of State control is the Oregon Compulsory Public School Law, which prohibits the instruction of children between the ages of 8 and 16 in private schools and compels attendance in public schools. Supported by the attitude of the Supreme Court in the German language cases, the United States Supreme Court declared that the Oregon Compulsory School Law infringed upon the liberties of the parents, invaded the property rights of the private institutions affected, and usurped the natural and inherent rights of parochial and private schools to each. These laws indicate in the field of State legislation a present tendency to strain the powers of sovereignty to the breaking-point, and to transgress unduly the reserved rights of the people in accordance with the Bill of Rights, most of which are found in the first 10 amendments to the Federal Constitution.

**The Eighteenth Amendment.** The advent of prohibition as a national policy has presented many important and original legal questions. The Supreme Court upheld the validity of the Eighteenth Amendment and the constitutionality of the National Prohibition Act which was passed to enforce the Amendment.

The Eighteenth Amendment provides that Congress and the several States shall have con-

current power to enforce this Amendment by appropriate legislation. Pursuant to this concurrent jurisdiction, many States passed local enforcement laws. This dual administration of prohibition raised the question whether an individual could be punished twice for the same violation, once by the Federal and again by State authorities. The question was answered by the Supreme Court to the effect that the Eighteenth Amendment was a limitation and not a grant of power to the States, and that the same act may be an offense against both the State and Federal governments without offending the "double jeopardy" provision of the Fifth Amendment.

Under section 21 of the National Prohibition Act, any house, building, or place where intoxicating liquor is manufactured, sold, kept or bartered, is declared to be a common nuisance, and by section 22, the said nuisance may be abated through the exercise of the "padlocking" power of the courts. Interesting questions have arisen with reference to the extent of this padlocking power against the landlord of a tenant who has been convicted of violation of the National Prohibition Act. Generally stated, the courts have not hesitated to exercise the power of padlocking against a landlord when he actually knew, or ought to have known, that the leased premises were being operated by his tenant in violation of law. The tenor of the decisions indicates that the landlord is under a duty to exercise reasonable diligence in preventing the leased premises from being used contrary to the provisions of the National Prohibition Act.

Again, under section 26 of the National Prohibition Act, any vehicle used in the transportation of intoxicating liquor may be seized. Obviously, no difficulty arises in the lawful seizure and sale of any vehicle owned by the person violating the National Prohibition Act. Questions have arisen, however, with reference to the right of the Government to seize and sell vehicles owned by third persons. The trend of judicial decisions indicates that established innocence on the part of the owner of the vehicle will be followed by a return of the vehicle to him. On the other hand, if he colluded directly or indirectly with the operator of the vehicle, no protection will be offered to him simply because he did not actively operate the vehicle at the time. Frequently, it appears that third persons, not the owners of the vehicle, have liens against it. While the courts have not allowed these liens to interfere with the sale of the vehicle being used in violation of the National Prohibition Act, the lienors, acting in good faith, have been allowed to obtain the amount of their liens out of the sale price which was obtained for the vehicle by the Government.

**Property.** The initiative and enterprise of man are dependent upon the recognition of his right to the fruits of his labor, the privilege of acquiring property from his accumulations and the guarantee that the State will protect his goods from unlawful aggression. Hence, property law has its proper place in the legal order. In the development of the law of property, changes are less frequent than in other branches. There is manifest an emphasis upon certainty and rigidity in the rules governing the acquisition, enjoyment, and transfer of property. This stability is necessary in order that the legal consequences of action concerning property may be definitely determinable.

Even the law of property, however, is not wholly free from force of external changes in the march of events. No longer can we say with Blackstone that the rights of private property cannot be invaded even for the general good of the whole community. Property is losing its individualistic coloring and is gradually becoming socialized. This does not portend the overthrow of private property, but it indicates rather the realization that the ownership of property is a trusteeship in which society has a latent interest. The owner of property is subject to the control by the State in its acquisition, use, and disposition. Charitable corporations are frequently restricted as to the quantity of land which they may acquire; the use of land is dependent upon the effects of such user upon the public; and the disposition of property is subject to stringent rules against entangling provisions which tend to suspend its transferability. The "dead-hand" influence is reprobated by statutes which prohibit stipulations preventing alienation. These limitations are of ancient lineage, but their principle is visible in more recent extensions of the same fundamental principle.

The shortage of homes, incident to the War, resulted in the passage of emergency rent legislation which took from the owners the right to fix the rental value of their properties and transferred this property right to administrative boards with power to adjust controversies between landlords and tenants. This power, operating to diminish materially the rights of ownership, was upheld as necessary in view of the public need; but it was plainly limited to the present emergency and the Supreme Court of the United States refused to continue its provisions in the absence of proof that the emergency still existed in the District of Columbia.

An event which is not without considerable interest in the development of the law of property in America is the comprehensive and fundamental codification of the English property law. This law aims at simplification and clarification of property rights, reduces materially the number and complexities of common-law estates, and renders obsolete a great part of the classic rules of property. It is symptomatic of the general recognition that the law has lagged behind the progress of society and requires a thorough overhauling to bring it down to date. The success of the English experiment will be followed with interest in the United States and will probably arouse American jurists to initiate similar reforms.

America is beginning to recognize the imperative need for a readjustment of the property law governing the descent and distribution of property. A typical illustration of the tendency to reform property laws is found in the report of a commission appointed in New York in 1927, delegated with the duty of proposing changes and drafting a law in the matter of the descent and distribution of real and personal property. This commission filed a report in 1928 outlining the following changes in the law of property: (1) The removal of distinction between real and personal property, and the assimilation of a uniform plan for the inheritance and distribution of real and personal property. (2) The substantial increase of the present dower right of the widow and the elimination of the existing inchoate right of dower as a burdensome restraint on the conveyance of real property.

In support of this general movement of reform, to the end that the present distinctions between real property and personal property may be eliminated, it may be said that the present distinctions between real and personal property are mainly based upon historical reasons no longer important. Sound policy dictates that the property of an individual after death should pass to definite beneficiaries without reference to the character or kind of property so transferred. Again, personal property has become more common with the expansion of credit and the purchase of stocks, bonds, and other securities by the public. Land no longer constitutes the major portion of inherited wealth. Hence, the wisdom of treating all property, whether real or personal, in accordance with similar rules of descent is generally conceded and will make for simplification and equality in the inheritance of property in general.

**Contracts.** Social, economic, and commercial changes cause corresponding changes in the branches of the law immediately affected. In an era of expanding commerce and industrial growth based upon credit and confidence, it is inevitable that contracts should enter into a majority of mercantile transactions. The preliminary agreement, the sale of goods, the conveyance of land, the issuance of instruments of credit, the guarantee of payments, the formation of partnerships and corporations, all these business relations necessitate the passing of promises which form the central field of contract law. Due to the fluctuating problems of commerce, the law of contracts discloses renewed signs of activity.

The fundamental questions of offer and acceptance, consideration, and the like are being reopened and debated in the light of modern business requirements. One of the litigated enigmas of contracts is the definition of the real elements of a promise which will render the promisor legally liable to the promisee. Is it necessary for the promisee to give or to promise to give an equivalent value to the promisor? Or is it sufficient that the parties make a business bargain independent of the relative value of the respective promises or acts? Or does it suffice that a promise is made which is relied on by the promisee without the promisor's assumption of any affirmative obligation?

These queries outline the conflicting theories of the nature of consideration. Dean Roscoe Pound has styled them respectively as (1) the equivalent theory, (2) the bargain theory, and (3) the injurious-reliance theory. The leading theory today is the bargain theory, which validates all promises which arise out of a give-and-take bargain. Under this view, it is not fatal that the more exacting requirements of the equivalent theory are missing; but there is a perceptible effort being made by the courts to enlarge the scope of contractual liability according to the mandates of the so-called injurious-reliance theory. This latter theory may seem to be too idealistic in that it seeks to impose a liability for a promise which is not balanced by a corresponding promise from the other party to the agreement; but it is predicated upon the sound ethical doctrine that it is not right for a man to violate his promises even when they are gratuitous. Certainly, it is unfair to do so when the promisee acts upon the assumption that the promise will be fulfilled and suffers damage by reason of his reliance.

Despite the undercurrent of support for the reliance theory, the prevalent definition of consideration includes the element of mutual undertakings by both parties.

Standardization of the law of contracts has made appreciable progress in certain branches. Insurance contracts have been made uniform by legislation. Negotiable instruments, sales, bills of lading, warehouse receipts, stock certificates, and partnerships have been subjects which are governed by uniform acts in many States. Ambitious attempts have been made in a few States to reduce the whole field of contract law to a code; but the attempts have been premature and generally unsuccessful. Codification must involve a restatement of the law; and the difficulty is that one cannot restate that which has not yet been definitely stated. The conflicting theories must first be evaluated and weighed before a complete code can be successful.

**Torts.** A tort has been defined as "a wrong independent of contract." It may be said that the law of torts embraces the liability of individuals for the invasion of the rights of others when this liability is not based upon a contract. It includes the invasion of noncontractual rights of person and property, whether the transgression is willful or negligent. One of the marks identifying a common-law tort has heretofore been the proof of some fault on the part of the defendant. A tortious wrong connoted a wrongdoer. Assuming no personal culpability, no willful or negligent action or inaction, the common-law rule was that there could be no liability without fault. If the damage was purely accidental, the maxim, *damnum absque injuria*, applied.

Exceptions are being engrafted upon the cardinal principle of no liability without fault. It is no longer true that liability presupposes a wrongdoer. Laws frequently impose absolute duties which eliminate the necessity of proving fault as an ingredient. A typical example is workmen's-compensation legislation, now generally operative in the United States, which fixes liability on the employer for injuries to his employees incurred in the course of their employment. The absence of due care of the employee or the absence of negligence on the part of the employer are of no consequence. The employer is an insurer and must reimburse the injured employee. Apart from statutes, many American courts have broken down the common-law rule by holding that a person may be liable for damages due to his keeping instrumentalities which are inherently dangerous if they escape. If these agencies actually cause damage, liability follows without any proof of concurrent fault on the owner's part. Other courts stubbornly resist the expansion of the principle of liability without fault and assert that it is hostile to the course of the common law.

The pragmatic school of jurisprudence, arguing for a sociological interpretation of law, disputes the contention that liability should be premised on fault. It is said that the correct approach to the question of legal liability should be the balancing of the whole circle of conflicting social interests and the recognition of the predominant claims of society. If social progress and economic interests will be advanced by the enlargement of individual responsibility, there is no barrier against the consequent liability. The elevation of social



interests, prominent in the tenets of modern legal philosophy, is a reaction against the rigid individualism of the nineteenth century. It has a proper place in the formulation of rules of legal liability, but it is possible that, in our zeal to promote the general welfare, we may unduly submerge the individual welfare. Excessive paternalism is just as dangerous as excessive individualism. In the judgment of many, we are rapidly approaching the danger point of unwise and futile attempts to correct human failings by the compulsion of law. So also it may be suggested that the complete abandonment of the common-law principle of no liability without fault is fraught with potential harm.

It is generally stated that there is liability when there is fault accompanied by actual damage; but this proposition is sometimes debatable. A lively controversy exists regarding the right to recover damages for mental fright due to the negligent conduct of another when no direct physical impact is present. Some courts contest the existence of any right to recover damages owing to the difficulty of tracing the damage and the dangers of malingering and falsification. If this practical objection can be removed, it is arguable that the form of the damage should not be an obstacle to legal redress. Medical science is progressing to the point where it is possible to distinguish between real and feigned nervous disorders. The result is noticeable in the gradual enlargement of cases allowing recovery for fright negligently or willfully caused by the defendant's conduct. A somewhat similar question arises when an unborn child is alleged to have been injured by the negligence of the defendant before birth. Has the unborn child a right to sue for damages? The almost unanimous view of the courts is that no recovery will be allowed. The practical objection is that it is impossible to prove the source of the injuries. It is also said that the unborn child is not a legal entity at the time of the injury; but this treatment of the child yet unborn as beyond the pale of legal rights has been subject to established exceptions in the criminal law and the law of property. If the cause of the damage is certain and can be traced to the willful or negligent acts of another, it is somewhat artificial to find the law protecting the property rights of an unborn child, punishing criminally pre-natal killing of the child, and denying a civil remedy to the child after birth.

**Law Reform.** The progress of the law is indicated not only by the course of decisions and legislation, but also by movements to reform the law which are visible in society. A study of law reform serves two purposes: it portrays shortcomings in the administration of the law, and it discloses the tangible form of the proposed remedies. Six major tendencies or agencies which are destined to shape juristic development are prominent at the present time: (1) Reform of criminal law; (2) investigation of the bar; (3) the American Law Institute; (4) uniform State legislation; (5) reformation in legal education; and (6) law enforcement.

**Reform of Criminal Law.** There are two notable trends visible in the reform of criminal law: (1) The increased protection of society from crime through the enactment of more stringent laws and increased severity in matters of punishment, and (2) the study of the criminal

as a victim of environmental and hereditary traits for the purpose of correcting criminal tendencies in the individual by means of observation and treatment. These two trends to some extent overlap and contradict one another. Under the first, protection of society is deemed more important than the correction of the criminal; under the second, the primary object is to save the criminal from himself by study of criminal tendencies and the removal of the causes which make for violation of the criminal laws.

At the present time, the tendency seems to be to enact laws which increase the degree of punishment under the theory that severity of punishment stays the hand of the criminal. A typical illustration of this development is found in statutes which have been recently passed in New York, Vermont, North Dakota, California, and New Jersey eliminating all judicial discretion in the matter of sentences to be imposed on criminals who have been guilty of four or more major violations of criminal law. Recidivism, or the lapse by the criminal into prior criminal habits, is now recognized as a material factor to be taken into consideration in fixing the punishment for the particular crime committed by the criminal. Under the modern application of recidivism, it is frequently provided that fourth offenders must be sentenced for life on the theory that it is dangerous to society to permit these individuals to be at large.

A vigorous dissent is to be noted against the policy of stringent criminal laws. This dissent emanates from those criminologists who argue that prevention of crime cannot be accomplished by enhancing the severity of punishment; that the true remedy lies in the reformation of the criminal and the removal of the temptation of criminal violation by education, religious training, and home influence.

**Investigations of the Bar.** The truism that the practice of the law is a profession, not a business, calls for the elimination of practices recognized as permissible in the business world, but highly unethical in the confidential relation of attorney and client. Of late, the legal profession has faced the realization that members of the bar have been pursuing methods smacking of the market-place in an effort to obtain clients. Ambulance chasing, the hiring of runners with the inevitable sequence of fee-splitting, the manufacture and prosecution of fake claims in negligence litigation, perjured testimony—all these evils have become more evident in recent years.

While these practices have been strongly condemned by representatives groups of the legal profession, no appreciable steps have been taken to remove these shortcomings. A movement was instituted in New York in 1928, originating in the Bar Association of the metropolitan district, which culminated in a sweeping investigation of so-called ambulance chasing and attendant evils. The investigation was conducted by the judiciary on the theory that attorneys, as officers of the court, were subject to the court in matters concerning their professional conduct. A searching inquiry followed and disclosed that the above-mentioned evils were prevalent among a restricted number of attorneys. Disbarment proceedings have followed the discovery of unprofessional practices, and it is confidently expected that the result of the investigation will bring about an increased sense of the responsibility of the bar to the public as agents for the administration of justice.

*The American Law Institute.* One of the most widely held criticisms of the law is its present uncertainty and confusion of principles which impede the orderly and exact application of law. It is often difficult for lawyers to predict the outcome of lawsuits owing to the multiplication of diverse and overlapping rules and the inconsistent principles in different States, and sometimes even in the same State. Useless litigation is frequently the result of this confusion, or the compromise of valid claims. The remedy is to simplify and to clear away the accumulated mass of contradictory precedents; to make a new start by building up a body of legal formulas that will restore the power of predictability. The proposal is theoretically sound, but its practical accomplishment offers many difficulties.

The American Law Institute was formed to face these problems and to attempt their solution. The object of the Institute is: "To promote the clarification and simplification of the law and its better adaptation to social needs, to secure the better administration of justice, and to encourage and carry on scholarly and scientific legal work." Its members include the leading judges, lawyers, and law teachers of America, and in addition an active corps of specialists who are assigned particular topics of the law for intensive study. The perplexities of the task of restating the law in clearer form are frankly admitted by the members of the institute, but the need of the restatement has inspired the organization to make every effort to insure the success of the work. The institute was formally organized at a meeting held in Washington, Feb. 23, 1923. Many years must elapse before the concrete results of this important reform can be definitely determined.

*Uniform State Legislation.* The work of the National Conference on Uniform State Law deserves special mention in the consideration of legal reforms. This conference, comprising delegates from all the States, meets annually for the purpose of promoting uniformity in State laws. This is accomplished by the drafting, after careful study and analysis, of uniform statutes covering particular parts of the law. The acceptance of the drafts and their enactment by the State legislatures are purely voluntary, but the response, particularly in the field of commercial law, has been gratifying. Since these uniform acts contain many simplifications in the common-law and statutory principles, they have exercised considerable influence in ameliorating and unifying American law.

*Reformation in Legal Education.* Law schools, as the training centres of future lawyers, wield a potent influence upon the moral and intellectual calibre of the bench and bar. To appreciable degree, the standards of the lawyer and judge are formulated during their law-school course. Agitation for the elevation of the scholastic requirements in the law schools is a result of this close relation between legal education and legal practice. The American Bar Association has recommended that the study of law should be preceded by at least two years of college work. The proposal aroused some opposition on the ground that it would result in closing the doors of the law school to ambitious students; but the majority of the profession accepted the validity of the recommendation and the law schools, with few exceptions, are requiring this additional period of study.

*Law Enforcement.* It cannot be doubted that disregard of law and disobedience to law have greatly increased in recent times. This unfortunate situation is still increasing, if we may judge by statistical proof and careful surveys of the times. In an attempt to determine the causes and to find a remedy, the American Bar Association appointed the Special Committee on Law Enforcement. This committee sent out a country-wide questionnaire to prominent members of the bar and bench. The collated answers point to many causes for this breakdown of law enforcement: the demoralizing influence of war, the passage of legislation which the State cannot enforce, the spread of irreligion, the disintegration of family life, political influence in the administration of justice, and the tardiness and technicalities of legal processes.

These multiple and varied influences complicate the task of law enforcement. Indeed, it may be safely stated that one of the primary difficulties is that the law has gradually been burdened with duties which properly should be, and in the past have been, borne by other agencies or social control. There are limitations on the efficacy of law as a means of rectifying and leveling the inequalities and hardships of societal existence. The home, school, and church have their respective parts to perform in upholding the respect for authority and obedience to law. If the home is invaded with the evils of divorce, if the school fails to implant moral principles in the youth, if the influence of the church is weakened by internal dissension, it is futile to transfer to the State the obligation of social reformation.

There are, however, regions where the law has failed to do its part. In the province of criminal law, we are in need of a general simplification of procedure and substantive law. The law's delay is a potent factor in bringing about the present distrust of law. Time is of the essence in criminal and civil actions. A delay in the establishment of rights or the punishment of crimes is often as fatal as their nullification or destruction. The English practice combines speed and certainty in the detection and trial of criminal offenses. Its adoption in America would result in considerable improvement in the direction of law enforcement.

The future development of law is problematical and doubtful. There is abroad the settled conviction that the law is approaching a critical stage which necessitates a thorough reorganization. It is a hopeful augury that the legal profession recognizes the current shortcomings in the legal order and is offering concrete proposals to simplify and to clarify juridical principles, but the coöperation and support of the people are needed to restore and sustain the orderly progress of law. The sanctity and primacy of law rest upon the willing acquiescence and submission of the people, their spirit of obedience to lawful authority, no less than upon the successful installation of the stated devices of law reform. The problem for the future is not merely one of legal reformation; it also includes the preliminary and important task of social, domestic, industrial, and political purification. In these larger spheres, the law can assist, but it alone cannot cure the failings of humankind.

**LAWN TENNIS.** See TENNIS.

**LAWRENCE, DAVID HERBERT** (1835- ). An English novelist, born at Eastwood, Notting-

ham. He attended the Nottingham High School, and when 16 years old became a teacher. He later matriculated at the Nottingham Day Training College, and taught in London. Mr. Lawrence's works are profound studies of the reactions of human nature. His numerous publications, include: *Love Poems and Others* (1913); *Tortoises* (a creative animal study, 1921); *Birds, Beasts, and Flowers* (poems, 1923); *Amores* (poems, 1925); the plays *The Widowing of Mrs. Holroyd* (1914); *Touch and Go* (1920); and *David* (1926); the essays *Twilight in Italy* (1916), *Psychoanalysis and the Unconscious* (1921); *Fantasia of the Unconscious* (1922); *Studies in Classical American Literature* (1923); and *Mornings in Mexico* (1927); and the novels *The White Peacock* (1911); *Sons and Lovers* (1913); *Women in Love* (1921); *Aaron's Rod* (1922); *Kangaroo* (1923); *St. Mawr* (1925); *The Plumed Serpent* (1926); *Glad Ghosts* (1926); *The Woman Who Rode Away* (1928); *Collected Poems* (1929); and *Pansies*, poems (1929).

**LAWRENCE, THOMAS EDWARD** (1888- ). A British soldier, archaeologist and author, and, since 1919, a research fellow of All Souls College, Oxford. He was born in Wales, educated at Jesus and Magdalen College, Oxford, and went to Arabia, where he lived with the tribesmen, to write an archaeological thesis. After four years at the British Museum's excavation on the Euphrates, he joined the Secret Service in Cairo (1914). When the Arabs revolted against Turkey (1915), he determined to unite their forces with the British Army fighting the Turks. He obtained permission to enter the Hedjaz, where only Mohammedans were allowed, and became the director of the Arab revolt, although nominally only a friend of the native chief, Emir Feisal. Winning the confidence of the Arabs, he was able to unite the tribes into an effective army, which contributed greatly to the British successes against Turkey. He was known as "The Uncrowned King of Arabia" and was permitted to wear the curved dagger of a native Mohammedan ruler. He was the chief Arab representative at the Peace Conference (1919), and was adviser on Arabian affairs at the Colonial Office (1921-22), where he had a great deal to do with making Feisal King of Iraq. He refused all honors, including a peerage, and in his effort to shun publicity he served, under assumed names, in the air force and in the tank corps, remaining in both until his real name was discovered. With C. Leonard Wooley, he wrote *The Wilderness of Zin* (1915), and *Egyptian and Assyrian Antiquities, Department of Carchemish* (2 vols., 1914-21), two archaeological reports. He alone wrote *The Seven Pillars of Wisdom*, for private circulation (1926), and *Revolt in the Desert*, an account of his Arabian adventure (1927). Consult *With Lawrence in Arabia*, by Lowell Thomas (1924), and *Lawrence and the Arabs*, by Robert Rankin Graves, the poet (1927).

**LAWRENCE COLLEGE.** A coeducational institution comprising a college of liberal arts and a conservatory of music, at Appleton, Wis., founded in 1846. The student enrollment increased during the years 1914-28 from 439 to 800 in the college, and from 175 to 525 in the conservatory of music. The faculty during the same period was increased from 47 to 85 members. The endowment increased from \$905,423 to \$1,849,902; the value of the plant from \$490,-

110 to \$1,381,642; and the total income from \$134,527 to \$496,328. Whereas the library in 1923-24 contained 42,892 volumes, it had attained 46,000 volumes in 1927-28. During the period under review, a chapel with a seating capacity of 1600, a dormitory for women, a new athletic field, and a gymnasium, under construction in 1928, were added to the equipment of the college; the campus was enlarged; the department of business administration was merged with the department of economics, with four full-time teachers; a chair of Spanish was added to the faculty; and a general museum and a historical museum were established. The scholarship funds were doubled during the years 1924-28 and by 1928 totaled approximately \$100,000. President, Henry Merritt Wriston, Ph.D., LL.D.

**LAWRIE, LEE** (1877- ). An American sculptor, born in Rixdorf, Germany. He was brought to America in infancy and was educated at the public schools and Yale University and studied sculpture under St. Gaudens and Martiny. He is a member of the National Society of Sculptors and in 1921 and 1927 was awarded gold medals by the American Institute of Architects. His work includes the sculptural decorations in the United States Military Academy at West Point, reliefs and statues for many churches throughout the country, including the Church of Saint Vincent Ferrer, for the large reredos of St. Thomas' Church, New York, and the Harkness Memorial Tower and Archway, Yale University.

**LAZZARI, Iad'zà-rè, SILVIO** (1858- ). A French composer, born at Bozen, Switzerland. He studied at the Paris Conservatoire under Franck and Guiraud. During 1885-04 he wrote for various French journals advocating the cause of Wagner. He later lived in Paris, devoting his entire time to composition. On the occasion of the world première of his *Le Sauteriot* (Chicago, 1918), he visited the United States. His other works include: the operas *Armor* (Prague, 1898), *La Lépreuse* (Paris, 1912), and *La Tour de Feu* (Paris, 1927); a pantomime, *Lulu*; a ballet, *Melanie* (Paris, 1923); a symphonic poem, *Effet de nuit*; an orchestral suite, *Impressions*; *Konzertstück*, for piano and orchestra; a string quartet, an octet for woodwind, and a violin sonata; piano pieces; choruses and songs.

**LEA, FANNIE HEASLIP.** See AGEE, FANNIE HEASLIP LEA.

**LEACOCK, STEPHEN BUTLER** (1869- ). A Canadian writer and educator (see VOL. XIII). He continued as head of the department of political economy at McGill University. His later works include: *Arcadian Adventures with the Idle Rich* (1914); *Moonbeams from the Larger Lunacy* (1915); *Essays and Literary Studies* (1916); *Further Foolishness* (1916); *Frenzied Fiction* (1917); *The Hohenzollerns in America* (1919); *The Unsolved Riddle of Social Justice* (1920); *Winsome Winnie* (1920); *My Discovery of England* (1922); *Over the Footlights* (1923); *College Days* (1923); *The Garden of Folly* (1924); *Winnowed Wisdom* (1926); *Short Circuits* (1928). Leacock's life in *Mahers of Canadian Literature* (1923), was written by Peter McArthur.

**LEAD.** Many changes and developments in the lead industry have taken place since 1914. The industry was called upon during the World War to supply lead for munitions, but the uses of this metal in times of peace were far more important and are constantly growing with the

development of industry. In the order of their importance in 1927, the industrial uses of lead may be ranked as storage batteries, pigments, cable covering, building, solder, ammunition, bearing-metal, and foil.

Lead is produced in many countries of the world (see table), but the principal sources of supply are the United States, Mexico, Australia, Spain, and Germany; and of these, the United States easily leads. In the United States, Missouri, Utah, Idaho, and Oklahoma were the leading sources of production in 1927. Utah increased its output considerably between 1924 and 1928, as a result of the new improvements in selective flotation and ore-dressing practice, and consequently displaced Idaho in second position as a lead producer. The production estimates of the U. S. Bureau of Mines for 1928, however, indicated that Idaho had regained its former position

as the second producing State. Missouri and Oklahoma supply the soft lead ores that are comparatively free from silver, whereas the so-called complex silver-lead-zinc ores come from Idaho, Utah, and the inter-mountain region of western United States.

In 1913 the United States produced 462,460 short tons of primary lead from domestic and foreign ores; in 1923, 628,517 short tons of primary lead were refined; in 1927 the output was 812,545 short tons, of which Missouri produced 210,368 tons; Utah, 155,199; and Idaho, 150,618. The higher prices for lead recently prevailing have stimulated production, and research work has developed the selective flotation process to its present high state of perfection and widespread application. As a result of this new development, much lead is now recovered from ores that in the past could not be treated profitably.

#### PRODUCTION OF REFINED PRIMARY LEAD IN THE UNITED STATES

	1918 (Short tons)	1919 (Short tons)	1920 (Short tons)	1921 (Short tons)	1922 (Short tons)	1923 (Short tons)	1924 (Short tons)	1925 (Short tons)	1926 (Short tons)	1927 (Short tons)	1928 (Short tons)
Domestic desilverized lead	282,024	208,701	220,327	187,962	185,191	291,760	299,343	345,429	366,413	378,889	346,199 *
Domestic soft lead	210,463	147,744	189,854	157,513	209,250	190,749	203,615	260,560	258,565	233,944	225,003
Domestic desilverized soft lead	47,418	67,938	66,668	52,747	74,305	6,332	63,449	48,932	55,707	55,487	55,000 *
Totals	539,905	424,433	476,849	398,222	468,746	543,841	566,407	654,921	680,685	668,320	626,202
Foreign desilverized lead	100,290	57,787	52,808	50,367	63,916	74,481	124,086	112,048	118,256	128,210	154,869
Total refined primary lead	640,195	482,220	529,657	448,589	532,662	618,322	690,493	766,969	798,941	796,530	781,071
Antimonial lead	18,579	13,874	12,535	10,064	8,075	14,190	20,787	19,667	22,524	24,347	33,058

\* Distribution in part estimated.

#### LEAD PRODUCTION OF THE WORLD (Smaller production in metric tons)

Year	Australia ( <sup>a</sup> )	Austria ( <sup>a</sup> )	Belgium ( <sup>a</sup> )	Burma ( <sup>a</sup> )	Canada ( <sup>a</sup> )	France ( <sup>a</sup> )	Germany ( <sup>a</sup> )	Greece ( <sup>a</sup> )	Italy ( <sup>a</sup> )
1912	113,710	19,993	44,308	.....	16,226	31,080	192,618	14,498	21,450
1913	110,444	1,368	54,940	5,951	17,089	28,817	181,100	18,309	21,674
1914	101,788	755	53,590	10,717	19,888	29,601	198,450	20,684	20,464
1915	102,721	.....	45,560	13,758	21,009	14,539	134,750	11,595	21,812
1916	140,561	.....	16,770	14,011	18,823	24,276	106,807	9,424	24,362
1917	150,217	783	15,560	17,233	14,776	21,235	86,228	1,422	16,237
1918	169,415	.....	22,745	19,380	28,314	12,778	74,600	4,093	18,332
1919	84,064	.....	20,630	19,396	19,880	10,928	51,480	3,841	16,530
1920	6,113	3,973	4,225	24,198	16,309	15,059	59,000	5,016	15,947
1921	57,296	6,130	16,040	34,258	30,245	15,475	75,000	5,575	12,494
1922	109,046	3,725	29,750	39,843	42,323	12,944	73,512	4,403	10,850
1923	124,042	4,255	43,574	46,484	50,456	17,418	48,952	4,234	17,132
1924	130,501	4,984	51,100	52,589	80,630	18,880	70,275	5,106	22,061
1925	150,203	5,408	65,570	48,032	115,209	20,540	97,848	5,366	24,475
1926	154,598	6,478	61,762	55,202	128,265	19,500	104,039	5,100	23,590
1927	167,569	8,086	65,501	67,027	141,383	24,900	110,684	4,800	23,840
1928	165,842	8,135	64,876	79,643	154,518	22,911	123,245	7,200	21,260

Year	Japan ( <sup>a</sup> )	Mexico ( <sup>a</sup> )	Rhodesia ( <sup>a</sup> )	Spain ( <sup>a</sup> )	Sweden ( <sup>a</sup> )	United Kingdom ( <sup>a</sup> )	United States ( <sup>a</sup> )	Other Countries	Totals
1912	3,613	109,717 <sup>b</sup>	.....	232,613	1,073	27,728	376,947	1,005	1,212,252
1913	3,777	62,000	.....	198,829	1,235	18,462	396,034	2,400	1,162,874
1914	4,563	23,598	.....	145,524	1,396	19,684	485,011	12,500	1,138,183
1915	4,764	31,884	485	174,472	1,918	15,767	487,177	12,600	1,055,521
1916	11,343	19,966	1,264	147,407	2,076	12,890	540,892	19,900	1,109,562
1917	15,807	46,612	3,892	172,909	3,174	11,431	527,729	25,700	1,138,150
1918	10,769	88,503	9,308	169,709	2,241	11,083	504,614	23,800	1,162,566
1919	5,771	78,645	12,859	125,721	827	10,441	412,704	27,200	884,412
1920	4,167	86,209	14,855	175,195	863	11,136	427,966	26,966	907,920
1921	3,198	60,513	17,699	158,661	488	2,474	369,136	23,700	879,442
1922	3,239	120,821	20,881	119,200	379	5,036	432,562	35,300	1,077,640
1923	2,700	167,144	11,198	127,514	200	6,815	506,235	33,000	1,218,025
1924	2,941	161,207	6,853	137,114	671	5,388	532,691	45,000	1,330,841
1925	3,337	186,120	3,333	138,200	817	4,811	611,973	75,000	1,548,928
1926	4,000	200,381	3,893	147,392	563	4,334	637,937	54,000	1,602,773
1927	4,000	248,695	5,952	139,053	330	6,132	614,385	55,000	1,688,000
1928	4,000	236,484	4,745	123,063	.....	5,600	580,480	68,346	1,675,277

<sup>a</sup> From official reports of countries unless otherwise denoted. <sup>b</sup> Exports. <sup>c</sup> Including Upper Silesia.

<sup>d</sup> Estimated.

<sup>e</sup> From Eng. Min. Jour.

<sup>f</sup> Am. Bur. Metal Stat.

The production of red lead in the United States reached a maximum of 42,550 short tons, valued at \$9,181,072 in 1926. The maximum for white lead was 194,991 short tons in 1922, valued at \$35,513,395. The maximum output of litharge came in 1925, when a production of 86,546 tons, valued at \$18,587,399, was recorded. The year 1927 witnessed the maximum imports of lead into the United States, when the total content of lead in ore, base bullion, pigs, bars, and sheets, reached 324,646,263 pounds.

**LEAGUE OF NATIONS.** The organization and establishment of a definite agency of international coöperation designed to further concerted action both in the preservation of the future peace of the world and in the promotion of general human welfare—the League of Nations—was the greatest constructive achievement of the Peace Conference at Paris. For the origins of this significant institution, one is obliged to seek far beyond the council chamber of the Peace Conference. However, for the present consideration, it is desirable without further introduction to recall the First and Second Hague Peace Conferences (1899, 1907) which to optimistically minded pacifists seemed extremely auspicious—"the real beginning of an organized international state, with its capital in The Hague, with its regular congresses, with its statutes and codes, with its permanent court of arbitration." They failed to perceive the essential anarchy and increasing tension of international relations, the ominous forces of nationalism, imperialism, militarism, secret diplomacy, and systems of alliances potentially operating to disrupt the state system and to produce the most stupendous catastrophe in all history—the great World War of 1914–18. The precipitation of this vast conflict was a shock and a disillusionment, but to hundreds of thousands in the Allied countries, the protracted struggle gradually took on the aspects of a great and disinterested crusade for eternal peace and righteousness. It became "the war to end war."

Statesmen in all the Allied countries from time to time gave voice to idealistic pronouncements regarding war aims. Premier Asquith spoke of a "real European partnership" and the passing years witnessed ever-increasing coöperation on the part of the Entente governments. It is safe to say that Anglo-American advocacy was the most important factor in promoting the definite formulation of the League concept. Colonel House's (see HOUSE, EDWARD M.) famous pre-war mission in 1914 for the furtherance of a general agreement between the United States, Great Britain, France, and Germany had in it the germ of a world concert of Powers and House subsequently evolved into a zealous and indefatigable champion of the League of Nations ideal.

With the lessons of the Serajevo crisis fresh in mind, Sir Edward Grey, British Foreign Minister, in numerous letters to House, emphasized ceaselessly his belief that the future peace of the world was contingent upon the substitution of regular and permanent international conferences and concerted organization for the existing nationalistic anarchy. Most significant of all, however, was the progressive espousal of the project by President Woodrow Wilson. In December, 1914, he planned the negotiation of a general Pan-American pact for the preservation of peace in the Western Hemisphere, the basic formula of which should be "mutual guarantees

of political independence under republican form of government and mutual guarantees of territorial integrity."

These negotiations continued through 1915 and 1916, but never reached fruition, largely because the diplomatic crises with European belligerents distracted Wilson's attention from American affairs; but these very crises, so destructive of any mythical concept of national isolation, impressed upon him the rôle which the United States might play in an association of nations not merely American but world-wide in character. Utilizing the substance of the Grey-House discussions, the President, in a stirring address before the American League to Enforce Peace on May 27, 1916, laid down three general principles which prefigured his international aims during subsequent years: (1) Every people has a right to choose the sovereignty under which it shall live. (2) The small states of the world have a right to enjoy the same respect for their sovereignty and for their territorial integrity that great and powerful nations expect and insist upon. (3) The world has a right to be free from every disturbance of its peace that has its origin in aggression and disregard of the rights of peoples and nations.

Here was Wilson's fundamental creed enunciated a year before America intervened in the great World War; his subsequent addresses represented merely the elaboration and refinement of details. In his note of Dec. 18, 1916, suggesting that the belligerents state their peace conditions, he intimated that "a concert of nations immediately practicable" should be the chief purpose of a settlement. Speaking before the United States Senate on Jan. 22, 1918, he advocated "a covenant of coöperative peace" and demanded the replacement of the old system of alliances by a general concert of Powers. His War Message of Apr. 2, 1917, emphasized American determination to fight for a "universal dominion of right by such a concert of free peoples" as should bring peace and safety to all nations.

The project for a league was incorporated in his address of Jan. 8, 1918, as the Fourteenth Point, viz., "a general association of nations must be formed under specific covenants for the purpose of affording guarantees of political independence and territorial integrity to great and small states alike." Reiterated in an address of July 4, 1918, President Wilson's advocacy of the project reached its war-time culmination in his address of Sept. 27, 1918, when he insisted that a league of nations would be an "indispensable instrumentality" of a secure and lasting peace and must constitute "the most essential part of the peace settlement itself." At the time of the Armistice, this stipulation, among others, was accepted by Germany and by the Entente Powers as a legal basis for subsequent negotiations. The President's momentous resolution to attend the Peace Conference in person expressed his unswerving determination that a league should be created.

President Wilson waited long before proceeding to anything like a draft of the frame work of the proposed league. Nevertheless, organizations such as the American League to Enforce Peace and the British League of Nations Association had long been engaged in drawing up plans for keeping the peace. Men like ex-President Taft, Elihu Root, Lord Robert Cecil,



and Lord Bryce had given the matter careful consideration, examining with a fresh interest the famous schemes propounded in previous centuries by Pierre du Bois, St. Thomas Aquinas, Marsiglio of Padua, King Henry IV, the Quaker, William Penn, the Abbé St. Pierre, the philosopher, Immanuel Kant, Czar Alexander I, and others. In September, 1917, Lord Robert Cecil wrote to Colonel House suggesting that the time had come to appoint a commission to study feasible plans; but Wilson discountenanced the proposition and during the winter of 1917-1918 no official steps were taken to institute public discussion that might crystallize opinion upon the character of the proposed league; but after his famous Fourteen Points pronouncement, Wilson, though asserting his personal conviction "that the administrative constitution of the League must grow and not be made," finally commissioned House to discuss the elements of a league with the most eminent of its American proponents—Taft, Root, and the distinguished university executives, Butler and Lowell.

In the meantime, the British government, largely under the stimulus of Lord Robert Cecil, had taken the definite step of appointing a committee, headed by Sir Walter Phillimore, to inquire, from a judicial and historical point of view, into the various schemes for establishing, by means of a league of nations or other device, some alternative to war as a method of settling international disputes. The Phillimore Committee submitted a draft convention on Mar. 20, 1918, outlining a plan pledging each of the Allied states not to go to war with another Allied state without previously submitting the matter in dispute to arbitration or to a conference. Any covenant-breaking state would *ipso facto* be at war with the other Allied states, which should be bound to take jointly and severally all such measures—military, naval, financial, and economic—as might best avail to punish the breach of covenant. Provision was likewise made for handling disputes with or between outside states, which also might apply for admission to the League. The Convention of the League was automatically to abrogate all treaty obligations *inter se* inconsistent with its terms. Thus, the Phillimore plan, despite its limitations, foreshadowed much of the substance of the final covenant.

A short time later, on June 8, 1918, a French government committee under the chairmanship of Léon Bourgeois reported a draft essentially similar to that which was subsequently introduced by the French at the Peace Conference. It provided for an annual International Council, and a permanent committee or secretariat. Juridical disputes were to go to the International Tribunal, other disputes to the Council. Diplomatic, juridical, and economic sanctions were provided and the decisions of both the Tribunal and the Council were to be enforced, if need be, by joint economic, military, and naval measures. The forces of the League were to consist of contingents supplied by member states, and were to be under a permanent international military staff. This report was sent to both the British and American governments.

When President Wilson received a copy of the Phillimore plan, he was absorbed in other problems and therefore requested Colonel House to consider and rewrite the proposed constitution. With some assistance from David Hunter Miller and Sir William Wiseman, Colonel House drafted

a covenant along his own lines, though incorporating several of the salient provisions of the Phillimore plan, and dispatched it to the President on July 16. Colonel House's plan provided for a more elaborate organization of League machinery, including not merely a conference of delegates, but a secretariat and an international court. The sanction of physical force was omitted in favor of recourse to blockade or economic coercion. A definite though flexible mutual guarantee of territorial integrity and political independence was incorporated, and the League was also to have the function of assuring peace through limitation of armament. Wilson approved the House draft almost in its entirety, but when rearranging and revising it in his own first draft, he conspicuously omitted the international court and restored the sanction of physical force. After discussing the revision with House in August, 1918, the President, though continuing his public advocacy of the League principle, seems to have let the matter of drafting a definite constitution rest until after the Armistice. In fact, he systematically and successfully opposed all efforts (e.g., those of the British government) to transfer discussion of the specific details of a covenant to the forum of general public opinion.

Once on board the *George Washington* en route to Europe, Wilson resumed consideration of the problem, announcing himself (Dec. 10, 1918) in favor of League control of territories conquered from the enemy. After his arrival in Paris, the President received, but was wholly uninfluenced by, certain suggestions from his Secretary of State, Robert Lansing, who championed the theoretical equality of all states and favored legalistic methods of settling international disputes. More important were two new projects, both British and based in large degree upon the Phillimore report, but each with characteristic features of its own—one by General Smuts of South Africa and the other by Lord Robert Cecil. Profoundly impressed by Smuts's plan, which was expounded in a brilliant pamphlet, Wilson utilized it in revising his own, taking over a whole new scheme of organization establishing a smaller executive council in addition to the general conference and secretariat embodied in previous plans, more definite ideas concerning limitation of armament, arbitration and its guarantees, and also a definite mandatory system for the supervision and control of conquered territory.

The Inter-Allied Labor and Socialist programme of February, 1918, had looked forward to the international administration of all colonial empires, but Smuts, to whose mind the mandatory concept had thus been suggested, limited its scope to territories dismembered from the Russian, Hapsburg, and Ottoman empires. Wilson, attracted to the central idea which had such deep roots in historic American policy (e.g., Cuba), advocated its application to the former German colonies.

Cecil's plan, which proposed domination of League activities by an executive council composed exclusively of the Great Powers, did not so much influence the President, but powerful currents of world opinion represented by the labor movement and Jewish propaganda caused Wilson to insert in his second draft provisions according more recognition to the interests of labor in the determination of world affairs and requiring all new states to grant equal rights to

their "racial or national minorities." In compliance with Wilson's request, this second draft, when printed and circulated on Jan. 10, 1919, brought forth a number of comments and criticisms, some of which (e.g., those submitted by General Bliss and David Hunter Miller) impelled him to prepare a new revised draft completed on January 20. Certain vital differences between this third Wilsonian draft and an official plan transmitted to him from the British delegation, led to a collation of the two into a compact plan by D. H. Miller and Lord Cecil (January 27) which was then subsequently revised by the legal advisers of the two delegations. This so-called Hurst-Miller draft, though wholly satisfactory to neither side, provided a broad basis of agreement between them. Wilson, it is true, prepared (February 2) a fourth draft of his own, but owing to opposition from Lord Cecil, this draft failed to supersede the compromise.

"Practically nothing—not a single idea—in the Covenant of the League was original with the President. His relation to it was mainly that of editor or compiler, selecting or rejecting, recasting or combining the projects that came in to him from other sources. He had two great basic convictions, that a League of Nations was necessary; that it must be brought into immediate existence." Thus wrote R. S. Baker in *Woodrow Wilson and World Settlement* (vol i, 1922, p. 214).

In December, 1918, Premier Clémenceau of France had openly expressed his desire to retain the old system of alliances; at the same time, Winston Churchill, of the British cabinet, mouthpiece of reactionary militarism had declared that the League was no substitute for British sea power. At Paris, most of the Allied Powers, including Japan, wanted the territorial, military, and economic settlements made first and in accordance with the provisions of the old secret treaties, before any attempt should be made to set up the League. The French, in listing the subjects to be considered by the conference, placed the League last. Wilson, warmly supported by Cecil and Smuts of the British delegation, placed it first and insisted that a League of Nations should be made "an integral part of the general treaty of peace." A resolution to that effect, passed by the Council of Ten on January 22, was accepted by the second plenary session three days later, and a commission was appointed, composed of two representatives from each of the five great Powers (United States, Great Britain, France, Italy, and Japan) and one from each of the five, later nine, small powers (Serbia, China, Brazil, Portugal, Belgium, Czechoslovakia, Poland, Greece, and Rumania). President Wilson became chairman of this commission, the membership of which, as ultimately constituted, embraced such leaders as Premier Orlando of Italy, Baron Makino of Japan, Cecil and Smuts of the British Empire, House of the United States, Bourgeois and Larnaudi of France, Venizelos of Greece, Hymans of Belgium, and Wellington Koo of China. Using the Hurst-Miller compromise plan as a basis of discussion in preference to drafts submitted by the French and Italians, respectively, the commission held ten meetings, February 3-10.

The French desperately endeavored to convert the projected league into a buttress of French security by advocating an international army directed by an international general staff which

should execute the decisions of the League and supervise all military affairs including reduction of armaments. The Italians opposed any attempt to incorporate a provision for the abolition of conscription. The Japanese, supported in this sole instance by the Chinese, insisted upon explicit recognition of the principle of racial equality. Both the French and the Japanese suggestions were rejected as was likewise a religious toleration clause sponsored by Wilson, the most important single alteration being the reinsertion of an article calling for the establishment of a Permanent Court of International Justice. A complete tentative draft of the covenant was submitted to the third plenary session of the conference on February 14 and adopted unanimously.

Meanwhile, a keen struggle in the Council of Ten (January 23-30) had resulted in the reluctant acceptance of a resolution providing for the application of League mandates to the administration of former German colonies rather than cessions in absolute sovereignty as demanded by the British, French, Italians, and Japanese.

The battle over the League was by no means at an end. During Wilson's absence from Paris in late February and early March, the project was necessarily in abeyance, though by no means side-tracked as has been alleged. While in America, the President became acquainted at first hand with Senatorial opposition to the Covenant, and after consulting with his Democratic advisers and certain leading pro-League Republicans including Taft, Root, and Lowell, he returned to Paris determined to secure three amendments designed to cover American criticism. They embraced: (1) Specific recognition of the Monroe Doctrine. (2) Provision for voluntary withdrawal of any state (e.g., America) from the League upon stipulated notice. (3) Specific exclusion of domestic questions from the purview of League activity.

Arriving at Paris, March 14, Wilson quickly repudiated a project which had gained ground during his absence, to impose preliminary general peace terms upon the enemy without immediately establishing the League. On March 18, in conference with Lord Cecil, he agreed upon certain changes in the covenant. On March 20 and 21, a sub-committee of the League of Nations Commission held meetings with the representatives of 13 neutral Powers to discuss the Covenant, the result being a number of proposed textual amendments. The full commission resumed its deliberations from March 22 to April 11, holding five night sessions during the most critical period of the Peace Conference. See *PEACE CONFERENCE AND TREATIES*.

Wilson's desire to have the Covenant altered in accordance with American interests reopened the former struggle with French and Japanese over the respective plans for an international military organization and recognition of racial equality. Even the British (with certain exceptions) opposed specific mention of the Monroe Doctrine, but they were eventually won over and, through a personal understanding with Clémenceau over other French claims before the conference, Wilson secured sufficient backing to have his amendments adopted and the French and Japanese proposals rejected. Revision of the Covenant being thus finally completed by the commission on April 28, it was accepted by the fourth plenary session for subsequent incorpora-

tion as the first section in each of the major treaties of peace.

When the tentative terms of peace were submitted to the Germans at Versailles (May 7), they proceeded among other things to formulate (May 9) an alternative project for a league of nations with an elaborate machinery for mediation, arbitration, and adjudication of disputes. Its membership, they contended, should embrace all the recent belligerent Powers, as well as eligible neutral states. After careful consideration by a committee, this counter plan was rejected by the Allies (May 22). Again on May 29, the German delegation protested vigorously against the proposed non-admission of Germany, but without avail. On June 28, 1919, was signed the epoch-making Treaty of Versailles formally embodying the Covenant of the League of Nations.

The Covenant of the League of Nations as thus framed was a comparatively brief document setting forth in 26 articles the rights, obligations, and privileges of the member states. The 32 Allied and Associated Powers convened at Paris (see *PEACE CONFERENCE AND TREATIES*), of which the United States, Ecuador, and Hedjaz alone subsequently refused to join, were designated as original members, and 13 neutral states, viz., Argentina, Chile, Colombia, Denmark, the Netherlands, Norway, Paraguay, Persia, Salvador, Spain, Sweden, Switzerland, and Venezuela, were invited immediately to accede to the Covenant. The desire of the British and Americans forthwith to admit the enemy Powers was frustrated by the opposition of France and Belgium. Certain other states—notably Russia and Mexico—whose governments had not been formally recognized by the Powers generally, were also temporarily excluded. Provision was made for the admission of any fully self-governing state, dominion, or colony as a new member by a two-thirds vote of the General Assembly of the League, and for the withdrawal from the League of any member on two years' notice, "provided that all its international obligations and all its obligations under this Covenant shall have been fulfilled." In accordance with the former provisions, Austria and Bulgaria, as well as Finland, Luxemburg, Costa Rica, and Albania were admitted to membership in December, 1920; Estonia, Latvia, and Lithuania in September, 1921; Hungary in September, 1922; Abyssinia and the Irish Free State in 1923; the Dominican Republic in 1924; and Germany in 1926.

In accordance with the latter provision, Costa Rica on Dec. 24, 1924, announced an intention to withdraw, effective Dec. 31, 1926. During 1928 steps were taken to induce her to reverse this decision. Brazil, likewise, gave notice effective June 13, 1928, of her withdrawal though still professing devoted collaboration with the League. Spain gave notice on Sept. 11, 1926, but before it became effective was induced (March, 1928) to rescind her decision. The other principal sovereign states still outside the League in July, 1929, were Afghanistan, Ecuador, Egypt, Mexico, Sultanate of Nejd, Turkey, Union of Socialist Soviet Republics, and the United States. All of these states, however, participated in specific conferences or committees of the League and frequently responded to invitations to accede to its international conventions.

Three organs of administration and control and one judicial organ were to be established;

namely, an Assembly, a Council, a Permanent Secretariat, and a Permanent Court of International Justice. The Assembly was to meet at stated intervals at the seat of the League and was empowered to deal with any matter within the purview of the Covenant, each member state, including the British Dominions, being entitled to only one vote in its meetings though privileged to send at most three representatives. The Council, as originally provided, was to consist of representatives of nine states comprising, first, five permanent members—the United States, the British Empire, France, Italy, and Japan—and secondly, four others to be selected or superseded by the Assembly "from time to time at its discretion," the first non-permanent members being provisionally designated by the Covenant as Belgium, Brazil, Spain, and Greece. Each state represented on the Council was to have one delegate and only one vote. Additions to either of the two classes of members—permanent and non-permanent—might be made by the Council if such action secured the approval of the Assembly, and it was also stipulated that any member of the League might be represented at meetings of the Council whenever any matter specifically affecting its interest should come up for consideration. Parties to disputes were to have no vote, however, and decisions by the Council normally had to be unanimous. The Permanent Secretariat, comprising a secretary general and such secretaries and staff as might be required, was to be established at Geneva, the first seat of the League.

The purposes of the League as set forth in the preamble to the Covenant were "to promote international coöperation, and to achieve international peace and security." The Covenant embodied pointed endeavors to mitigate or eliminate the general forces alluded to above as operating to cause wars in the state system, namely, nationalism, militarism, imperialism, secret diplomacy, and systems of alliances, and also to provide agencies for the settlement of specific disputes between nations. To this end, the signatory Powers pledged themselves (Art. 10) "to respect and preserve as against external aggression the territorial integrity and existing political independence of all members of the League." The members of the League recognized that the maintenance of peace required the "reduction of national armaments to the lowest point consistent with national safety and the enforcement by common action of international obligations." To the Council was intrusted the important function of formulating decennial plans for the reduction of armaments, which having once been accepted by the particular governments concerned were not to be changed without the consent of the Council. The Council also was empowered to suggest means for preventing the evils attendant upon the manufacture by private enterprise of munitions and implements of war. Members of the League undertook to interchange full and frank information as to the scale of their armaments and their military, naval, and aeronautical programmes.

Any war or threat of war, whether directly affecting any member or not, was declared to be a matter of concern to the whole League; and at the request of any member, a meeting of the Council should be summoned forthwith. Each member possessed the friendly right of calling

the attention of the Assembly or of the Council to any circumstance threatening international peace or good understanding. Members of the League were pledged to submit all potentially dangerous disputes, which could not be satisfactorily settled by diplomacy, either to arbitration or to inquiry by the Council and in no case to resort to war until three months after the award of the arbitrator or the report of the Council. The Permanent Court of International Justice, for whose establishment provision was made, was to be endowed with power to determine any international dispute submitted to it by the contestants and also give an advisory opinion on any matter referred to it by the Council or by the Assembly. Dangerous disputes not settled by diplomacy, or submitted to arbitration, were to be referred to the Council or through it to the Assembly, and if all efforts at conciliation failed, the facts and recommendations were to be published. Members obligated themselves not to go to war with the party to the dispute which accepted the suggestion of the conciliating agency, but any member resorting to war in violation of its covenants was *ipso facto* to be deemed to have committed an act of war against all other members, who bound themselves immediately to sever all commercial, financial, and personal relations with the nationals of the covenant-breaking state and to prevent any intercourse between that state and any other state whether a member of the League or not. The Council was invested with the duty of recommending what effective contribution each member of the League should contribute to the armed forces to be used to protect the covenants of the League. In the event of a dispute between a member of the League and an outside state, or between two or more nonmember states, the League was to offer its services; and if the invitation should be rejected and a member of the League attacked, all other members were to come to its aid.

The Covenant expressly affirmed the validity of international engagements, such as treaties of arbitration or regional understandings like the Monroe Doctrine, for securing the maintenance of peace, but all other obligations or understandings inconsistent with the terms of the Covenant were to be abrogated, the Assembly being empowered to advise the reconsideration of treaties which had become inapplicable. A blow was dealt to secret diplomacy by the requirement that henceforth every new treaty or international engagement should be forthwith registered with the Secretariat and published by it; and no such pact was to be considered binding until so registered.

As territorial greed and colonial rivalries had been prolific causes of war in the past, the Covenant provided a new system for controlling the German colonies and dismembered portions of the Turkish Empire, which were not to be divided among the victor's as spoils but administered as sacred trusts of civilization for the benefit of the peoples concerned. The various areas were to be intrusted to various members of the League under mandates prescribing the degree and kind of authority that they might exercise, guaranteeing certain rights to the natives and requiring annual reports from the mandatories. In other ways, the League was inextricably interwoven with the general peace settlement. To it were intrusted the adminis-

tration of international areas, such as the Saar Basin and the Free City of Danzig and the conduct of certain plebiscites, such as those in North Schleswig, Allenstein and Marienwerder, and Upper Silesia, which are discussed under their respective heads.

Members of the League pledged themselves to coöperate in the reciprocal establishment of freedom of transit and equitable treatment for commerce, in the improvement of labor conditions, the international prevention of disease and mitigation of suffering, the suppression of the arms traffic, the traffic in women and children, and in opium and other dangerous drugs. To the League were to be transferred all international bureaus and commissions. Provision was made for the amendment of the Covenant at any time by a unanimous vote of the Council and by a majority of the Assembly, though the somewhat faulty drafting of the Covenant was manifested by omission of any reference to ratifications.

The League of Nations formally came into existence on Jan. 10, 1920, with the exchange of ratifications of the Treaty of Versailles. During its early years, League activities developed along three main lines: (1) Establishment, operation, and development of its organs of administration and control. (2) The promotion of general international welfare. (3) The partial elimination of general causes of war and the attempted solution of certain specific disputes arising between nations.

**Development of Organs of Control.** First convened on Jan. 16, 1920, the Council up to June, 1929, held 55 sessions in various places though customarily at Geneva. Official rules of procedure were early adopted and the Council rapidly demonstrated itself to be a flexible organ of action well adapted to the requirements of a constantly changing situation. Starting with three items in the first session, the Council handled some 2400 items up to 1928. In 1922, with the subsequent approval of the Assembly, the Council increased its nonpermanent membership from four to six states, and in 1926 from six to nine. Germany was accorded a permanent seat upon its admission to the League in 1926, so that in 1929 there were five permanent members (a permanent place is reserved for the United States under the Covenant and another is probably available for the Soviet Union) and nine nonpermanent members.

At first, it was the practice of the Assembly to elect its representatives to the Council annually though the same states might be re-elected indefinitely. After an amendment to Art. 4, par. 2 of the Covenant, which became effective July 29, 1926, the Seventh Assembly proceeded in September of that year to adopt a new set of rules whereby three of the (now) nine nonpermanent members were to be elected each year to serve normally for three years and then to be ineligible for an equivalent period unless the disability be removed by a two-thirds majority of the Assembly—which in any case reserved full power to make a sweeping change of all nine in any one election. The states which have served are as follows, the asterisk indicating the nine members in August, 1929: Belgium (1926-28); Brazil (1926-28); \* Canada (1926-29); \* Chile (1926-29); China (1921-23, 1926-28); Colombia (1926-28); \* Cuba (1927-30); Czechoslovakia (1924-27); \* Finland (1927-30); Greece (1920); Netherlands (1926-

28): \* Persia (1928-31); \* Poland (1926-29, and reeligible); \* Rumania (1926-29); Salvador (1926-27); Spain (1920-26, 1928-31, and reeligible); Sweden (1923-26); Uruguay (1923-26); \* Venezuela (1928-31). In August, 1923, the Council decided that henceforth regular meetings would be held quarterly in December, March, June, and just prior to the annual meeting of the Assembly. Since 1926 the August-September meeting has split into two sessions, the Council reorganizing after the election of nonpermanent members by the Assembly.

The First Assembly, summoned by Woodrow Wilson as authorized in the Covenant, met at Geneva on Nov. 15, 1920, its session lasting until December 18, with 41 states represented. Henceforth, regular meetings were held annually in September and one special session was held in March, 1926, to consider Germany's admission to the League (see below). Though not possessing the flexibility and initiative of the Council, the Assembly came to occupy a place of considerable importance in the League. Its membership embraced men of experience in public affairs, often endowed with keen powers of criticism and in some cases real constructive ability—premiers, foreign ministers, members of parliaments and diplomatic corps. By prescription in the Covenant and by practice, the Assembly came to perform three duties exclusive to it, i.e., passing the annual budget, admitting new members, and electing nonpermanent members of the Council. By an amendment to the Covenant, Art. 6, par. 5, effective Aug. 13, 1924, the Assembly was to decide upon the proportion of the expenses of the League to be born by each member. The League budget for 1929 totaled 27,026,280 gold francs. Annual reports of the work of the Council and Secretariat, submitted to the Assembly for review, criticism, and approval, elicited discussions constituting an extremely useful appraisal of international progress and a challenging symposium of world opinion upon important questions. Indeed, the centre of gravity in the League slowly shifted from the Council to the Assembly with broadening democratic consequences.

By an annex to the original Covenant, Sir James Eric Drummond of Great Britain was named first Secretary General and during the next decade an elaborate but highly efficient and flexible Secretariat was developed under his direction. The Secretariat was charged with the task not only of preparing the work and executing the decisions of the Council and Assembly, but also of placing at their disposal extensive, detailed, specific, and up-to-date information upon the various topics and problems confronting one or the other. An admirable organization was developed to direct the multifarious and intricate activities falling under its supervision, the Secretariat being divided into various technical sections and administrative services with a technical staff of about 475 men and women experts drawn from some 40 nationalities. These members of the Secretariat acted in an international capacity and were not in any sense representatives of their own country.

Commencing with a treaty filed by Denmark, Norway, and Sweden on July 5, 1920, the secretariat had registered 2000 treaties by May, 1929. The League's Treaty Series, to which the United States government likewise in the course of time, decided to send its international engagements, thus became a vast compendium of the new in-

ternational law and organization of the world. About 500 public and private international agencies and commissions also had been placed under the ægis of the League.

In February, 1920, an advisory commission of 12 eminent international jurists was appointed by the Council to draft a statute organizing the Permanent Court of International Justice authorized by the Covenant (Art. 14). With the exception of the provision for obligatory jurisdiction and certain minor details, their report was approved by the Council during the summer of 1920 and adopted by the Assembly at its first meeting. Thirty-six nations made a futile effort to secure compulsory jurisdiction for the new court, but the Great Powers refused to engage themselves to submit all justiciable disputes thereto, although subsequently numerous smaller states signed an additional optional clause for compulsory jurisdiction, or entered into mutual agreements to that effect. "The jurisdiction of the Court," ran Art. 36 of the statute creating it, "comprises all cases which the parties refer to it and all matters specially provided for in the Treaties and Conventions in force." The new court was designed to be an impartial, permanent judicial organ, capable of settling international disputes of a purely legal character without the intrusion of political considerations. It was not intended to duplicate or supersede the Court of Arbitration created by the First Hague Peace Conference (1899). The two courts continued to exist side by side, the old court having the function of arbitrating a difficulty, the new one, the function of deciding what law applied in any given case. It was not intended, as were the Council and Assembly, to devise arrangements, adjustments, and compromises as a method of harmonizing conflicts between states, but simply to interpret, explain, and apply international laws and conventions. Following a suggestion made by Mr. Root of the United States, the statute provided for the election of judges for a term of nine years by an absolute majority in the Council and Assembly voting separately, thereby appeasing the demands of both large and small states for commensurate powers of choice. In September, 1921, 11 judges, including Prof. John Bassett Moore of the United States, and four deputy judges were chosen in this way. The first regular session of the Court was opened at its permanent seat (The Hague) on June 15, 1922.

**Promotion of International Welfare.** Up to 1929, perhaps the chief service performed by the League of Nations had been the promotion of international welfare. Its humanitarian work proved varied and efficient and by extensive technical investigations it threw much light upon unsolved social and economic problems. The Assembly and Council were assisted in specific phases of League business by what are known as "technical organizations." The fully developed technical organization devoted itself to a single field of international relations and consisted of three parts: (1) a section of the Secretariat serving as an exploring, recording, and secretarial body; (2) an advisory or technical committee composed of experts serving to give definite form to the material placed before it by member states or the Secretariat; and (3) conferences of representatives of member and other states convened on the advice of the committee and on invitation from the Council, result-



ing in international conventions submitted by signatory states to their appropriate internal organs for ratification.

In addition to the work of the International Labor Organization, discussed under LABOR ORGANIZATION, International, the following activities of the League of Nations may be noted:

**Economic and Financial Organization.** This included the creation of economic and financial committees of various types; the sponsoring of the Conference on International Coöperation in Statistics at London Aug. 14-15, 1919, before the League was formally in being, and the continuation of the *Monthly Bulletin of Statistics* hitherto published by the Supreme Economic Council; the convocation of the International Financial Conference at Brussels, Sept. 24-Oct. 8, 1920, attended by representatives of 39 states, which helped to clarify financial problems of reconstruction. Of unusual significance was the summoning by the Sixth Assembly of an International Economic Conference which sat at Geneva, May 4-23, 1927, attended by delegates and experts from 50 countries, the personnel including industrialists, merchants, bankers, economists, agriculturists, experienced officials and representatives of workers' and consumers' organizations and coöperative societies. This conference, after a general exchange of views on existing economic conditions and difficulties, adopted a final report embodying recommendations subsequently accepted in whole or in part by some 30 governments as a practicable international programme for economic peace and progress. Two annual sessions of an economic consultative committee were held at Geneva, May, 1928, and May, 1929, to survey the international economic situation as it developed subsequent to the conference. Numerous other conferences adopted conventions or protocols dealing with import and export, prohibition and restriction, simplification of customs formalities, arbitration of commercial disputes, unfair competition, and other aspects of international commercial intercourse.

The financial committee proved to be a medium through which the League of Nations contributed in a vital way to the financial reconstruction of Europe. By common consent, the aid of the League saved Austria and Hungary from bankruptcy, disaster, and anarchy, and restored them to their place in the world with their autonomy intact. Assistance, through loans floated under League auspices, was likewise rendered to the Free City of Danzig; to Estonia; to Bulgaria; and to Greece, as is discussed in the articles on these countries. Elaborate investigations into the vexatious problems of counterfeit currency, central bank statistics, and double taxation were launched.

**Organization for Communication and Transit.** Under this head are to be noted sessions of the General Conference on Freedom of Communications and Transit at Barcelona in 1921, at Geneva in 1923 and 1927, and the creation of an advisory and technical committee; the Conference of Press Experts at Geneva, 1927, the adoption of conventions and recommendations dealing with freedom of transit, passport and identity certificates, use of maritime ports and navigable waterways, vessel measurement, an international régime of railways, transmission of electric power, the development of hydraulic power, and the international circulation of motor vehicles. The calendar reform problem received

exhaustive attention. A convention signed at Lausanne, July 24, 1923, practically neutralized the Dardanelles, Sea of Marmora, and Bosphorus, and the commission created to administer this régime was placed under the supervision of the League.

**The Health Organization.** Acting through the General Health Advisory Commission, a standing committee and a section of the secretariat, the League incalculably furthered the work of promoting sanitation, fighting epidemics, collecting and disseminating epidemiological intelligence, arranging international interchanges of public health offices, standardizing sera and investigating the problems of infant mortality, cancer, and health insurance.

**Intellectual Coöperation.** In compliance with a resolution of the Second Assembly, the council decided, Jan. 14, 1922, to appoint a committee on intellectual coöperation with 12 members (increased to 15 in 1928). Henri Bergson, the French philosopher, H. A. Lorentz, the Dutch physicist, and Gilbert Murray, the Oxford Greek scholar, served successively as chairman of the committee, whose membership embraced such eminent scientists as Robert A. Millikan, the American physicist, Albert Einstein, the German physicist, and Mme. Curie, co-discoverer of radium. After affording assistance to intellectual workers, in numerous central European states, who confronted hard conditions as a result of the post-war derangement, the committee developed a programme for permanent work touching such important subjects as university relations, science and bibliography, arts and letters, intellectual rights, and instruction of youth. Upon the invitation and with the support of the French government, the International Institute of Intellectual Coöperation was established at Paris in 1926.

**Suppression of Opium Traffic.** Continuing pre-war efforts to abate the opium-traffic evil, the League appointed an advisory committee in 1921 and held two opium conferences in 1924-25, the convention of which became in 1926 and 1928 the starting point of its work in this field.

**Traffic in Women and Children.** The League held an International Conference at Geneva, June 30-July 5, 1921, with 35 states participating, which reaffirmed and supplemented pre-war engagements for suppressing this evil. An advisory committee on the traffic in women and children appointed in 1922 was reorganized in 1924 as the Advisory Commission for the Protection and Welfare of Children and Young People, with two sections, one dealing with the traffic in women and children and the other with child welfare. Energetic measures were set on foot to investigate the methods of traffickers. A special convention for suppressing the circulation of obscene publications signed at Geneva, Sept. 12, 1923, by 43 states, entered into force on Aug. 7, 1924.

**Refugees and Relief of Distress.** The first great humanitarian accomplishment was the repatriation of 430,000 prisoners of war belonging to 26 different nations at the phenomenally low average cost of \$5 per person. The Greek Refugee Settlement scheme dealt with 1,500,000 people, the Bulgarian with 200,000. Over 1,500,000 Russian refugees scattered throughout Europe and Asia required much attention. The same problem existed for 300,000 Armenians and other lesser groups. All of these situations were handled with humane effi-

ciency by League commissioners. Moreover, an International Relief Union was established (by convention and statute of July 12, 1927) for immediate action in case of disaster anywhere in the world regardless of race, nationality, or political or religious considerations.

**Mandates and Backward Peoples.** See **MANDATES**.

**Administration of Territory.** See **SAAR BASIN, DANZIG**.

**Progressive Codification of International Law.** The Committee of Justice appointed by the Council in 1920 to draft a statute for the Permanent Court of International Justice, also reported a resolution of its own dealing with the codification of international law. After some delay, the Council in response to a resolution of the Fifth Assembly (Sept. 22, 1924) appointed a committee of experts for the Progressive Codification of International Law (Dec. 12, 1924), which held annual sessions beginning in 1925 and made systematic preparations for a future codification conference to be held at The Hague. Of interest also was the establishment at Rome on May 30, 1928, of the International Institute for the Unification of Private Law, endowed by the Italian government and operating under the control of the League.

**Achievement of Arbitration, Security, and Disarmament.** Praiseworthy as had been the activity of the League of Nations in the promotion of international coöperation and general human welfare during the first decade of its existence, it nevertheless did not fulfill altogether satisfactorily its basic function of eliminating the general causes of war and settling specific disputes between states. During the peace negotiations, the Allied plenipotentiaries in response to the German delegation's protest against unilateral disarmament had made the following categorical reply: "The Allied and Associated Powers wish to make it clear that their requirements in regard to German armaments were not made solely with the object of rendering it impossible to resume her policy of military aggression. They are also the first step toward the general reduction and limitation of armaments which they seek to bring about as one of the most fruitful preventives of war, and which it will be one of the first duties of the League of Nations to promote." Efforts to make the covenant-prescribed (Art. 8) agreement upon the subject were continuous after 1920, but up to 1920 had led to no general result.

When the League went into operation, nearly all states felt that the control of national armament was one of the most sacred attributes and efficacious guarantees of their independence. On May 9, 1920, the council set up the Permanent Advisory Commission on Armaments (consult Art. 9 of Covenant) consisting of military, naval, and air officers appointed by the governments represented in the council. The First Assembly, however, resolved to entrust the problem to the Temporary Mixed Commission, so as to take it out of the hands of strictly professional military experts. The Second Assembly (1921) urged this commission to make proposals in the shape of a draft treaty, but the commission found that a general feeling of insecurity was the chief obstacle to action. The Third Assembly (1922) emphasized this view in resolutions stating that "moral disarmament is an essential preliminary condition of material disarmament, and that this moral disarmament can only be achieved in

an atmosphere of mutual confidence and security." The existence in the Covenant of Art. 10 did not seem to inspire "mutual confidence and security." Indeed, strangely enough, attempts were made (1920-23) to interpret away the significance of (and even to cut out by amendment) "the heart of the covenant," as Wilson had described it. In 1923 the Temporary Mixed Commission reported a draft treaty of mutual assistance (written largely by Lord Robert Cecil) to the Fourth Assembly which perfected the text for submission to the governments. Eighteen states approved it in principle, but various criticisms were leveled against it, one of which was that it did not take into sufficient account existing machinery for the pacific settlement of international disputes.

The deliberations of the brilliant Fifth Assembly (1924) were dramatized and vitalized by the brief attendance of Premiers Édouard Herriot of France and J. Ramsay MacDonald of Great Britain. These men had already given a more friendly complexion to European diplomacy. Fresh from the achievements of the London Conference on Reparations (see **REPARATIONS**), which launched the so-called Dawes Plan, they were imbued with the true League spirit. The result was the adoption of the famous Geneva Protocol for the Pacific Settlement of International Disputes opened for signature on Oct. 2, 1924. By a series of solemn pledges, the signatory states were committed to arbitration, they were to sanction the principle that aggressive war was no longer a recognized method of settling disputes, and they were to agree that a state was an aggressor when it refused to submit its case to arbitration. These principles were tantamount to acceptance of compulsory arbitration. When a certain number of states should have ratified the Protocol, the International Conference for Limitation of Armament was to meet at Geneva and, as soon as any plan for reduction adopted by that conference went into operation, the protocol was to become effective; but the downfall of the MacDonald ministry in Great Britain (see **GREAT BRITAIN, under History**) brought into power a new Conservative government which deemed it necessary to reserve the right to use force in remote parts of the world to which British rule and trade extended (witness the drastic ultimatum to Egypt—December, 1924), and which was reluctant to promise coöperation in any economic punitive measure, the chief reliance for enforcing the Protocol, while the United States remained outside the League. On Mar. 12, 1925, Sir Austen Chamberlain, the new British Foreign Secretary, announced to the Council his Government's decision not to ratify. The Geneva Protocol was dead.

Already a new project was in the offing, this time one initiated by Germany. For some years after the War, most Germans looked upon the League of Nations as a tool in the hands of their enemies, pointing in confirmation of this view to the Eupen-Malmédy plebiscite, the influence of France in the Saar Governing Commission, and the advantages given to Poland in the Upper Silesian award. After the adoption of the Dawes Plan, however, and under the realistic leadership of the brilliant Foreign Minister, Gustav Stresemann, the German attitude slowly altered. Obtaining the endorsement of his cabinet, Stresemann began to lay plans for taking Germany into the League. Encouraged by pri-

vate inquiries, he made formal application for admission on Dec. 11, 1924, stipulating four prerequisite conditions: (1) Germany would expect a permanent seat in the Council and general equality of treatment; (2) as a temporarily disarmed state, she could not be expected to contribute armed support to League measures against a defiant state; (3) in pledging herself to keep her obligations, she should not be understood as renewing her acceptance of the war-guilt affirmation (Art. 231) of the Treaty of Versailles; and (4) she would expect in due time to be given an active share in the working of the mandate system. On Mar. 14, 1925, the Council made a generally favorable reply; though asserting the impossibility of allowing special privileges to a nation coming into the League, it pointed out that there were provisions in the Covenant by which Germany's unarmed condition would be taken into account. The note concluded by expressing the desire of the Council to see Germany in the League and "thus play, in the organization of peace, a part corresponding to her position in the world."

Meanwhile (Feb. 9, 1925), Stresemann proposed to the French government the negotiation of a general pact guaranteeing the security of the existing frontiers in western Europe. Germany, moreover, would undertake not to go to war to change any of her eastern boundaries as fixed at Versailles, but she reserved the right to submit their modification to courts of arbitration or to the League of Nations. Briand, the French Foreign Minister, after securing a promise of British coöperation, replied to Berlin (June 18, 1925) suggesting that success depended upon Germany's assuming the obligations and enjoying the rights laid down in the Covenant of the League. A further exchange of views followed definitely preparing the way for a conference. A preliminary meeting of jurists at London (August 31) threshed out technical legal points.

The Sixth Assembly of the League (September, 1925), while reaffirming the cardinal principles of the defunct Geneva Protocol, gave its support to the proposed security pact. On Oct. 16, 1925, a treaty was tentatively signed at Locarno, Switzerland, by high-ranking representatives of Belgium, France, Germany, Great Britain, and Italy, pledging the maintenance of the existing boundaries in western Europe. Four arbitration conventions were concluded between Germany and Belgium, Germany and France, Germany and Czechoslovakia, and Germany and Poland, respectively. As one of the essential conditions of the pact, it was agreed that Germany should join the League of Nations. The conference at Locarno then adjourned, while parliamentary sanction for its engagements was sought in the various countries concerned. In France (see FRANCE, under *History*), where irreconcilable "Poincarism" was still strong, there were many who mistrusted any acceptance of Germany's word, but the prestige of Briand and the intense longing for peace supervened. In Great Britain (see GREAT BRITAIN, under *History*), the Locarno settlement received the support of the Conservative majority and of most of the Opposition. In the small nations on the continent, it was popular as offering a possible basis for enduring peace. The bitterest struggle occurred in Germany, but Stresemann finally (November 27) secured a decisive victory in the Reichstag. Four days later, on Dec. 1, 1925, the

conferees reconvened at London for the formal ceremony of acceptance. The Locarno pact was a reality.

The stage now seemed set for Germany's entrance into the League of Nations. In February, 1926, the German government made formal application for admission. A special meeting of the Council summoned a special meeting of the Assembly for March 8. Then developed an amazing situation. Spain and Brazil, both nonpermanent members of the Council, determined to block Germany's admission to a permanent seat until they received similar recognition: Poland, supported by France, advanced the same claim. The climax of absurdity was reached when Czechoslovakia, China, and Persia evinced similar ambitions. Stresemann, profoundly chagrined at these unforeseen complications and overwhelmed by the reproaches of fire-eating Nationalists at home, let it be known that Germany would not join the League at all unless she obtained a permanent seat in the Council with its significance undiminished by the accordance of such a position to any other state at the same time.

As March 8 approached and none of the contestants relaxed her pretensions, the situation became tense and strenuous. At Geneva, Chamberlain and Briand, whose secret manipulation had in some measure caused the deadlock, endeavored unsuccessfully to arrange a compromise through private negotiations. The prestige of the League was being sadly impaired by "the lamentable spectacle of intrigue and indecision," as one journalist described it. Finally, a face-saving arrangement was agreed upon, which cleared up the difficulty in part. Sweden magnanimously relinquished her nonpermanent seat in the Council in favor of Poland upon condition that a pro-French state retire in favor of Holland. (Czechoslovakia made the sacrifice.) Spain and Brazil remained adamant, however, and Briand, Chamberlain, and other leaders were obliged to confess defeat. To prevent irreparable injury to German feelings, the Locarno Powers issued a statement declaring that morally speaking, they considered Germany a member of the League. The Special Assembly convened, but consideration of Germany's application for membership was deferred until the regular September meeting. A committee on the composition of the Council was appointed to study the problem. Assisted by belated French and Spanish ratification of an amendment to the Covenant (proposed in 1922) giving the Assembly power to determine the method of election and to prescribe conditions of reëligibility for nonpermanent members of the Council, the committee conceived a plan whereby Germany alone was to be admitted to a permanent seat, the number of nonpermanent members was to be increased to nine (see above) elected for three-year terms, one-third retiring each year and then being ineligible for three years unless specifically declared reëligible by a two-thirds majority of the Assembly: Brazil gave formal notice (June 10, 1926) of intended withdrawal from the League (in accordance with Art. 1 of the Covenant).

The Committee's report was approved by the Council and submitted to the Seventh Assembly, which met Sept. 6, 1926. Two days later, Germany's application for membership was passed by a unanimous vote. The award of a permanent seat to Germany coupled with the increase of nonpermanent Council seats was approved.

On September 10, the German delegation was welcomed to membership. Stresemann mounted the tribune and delivered an address lauding the aims of the League and pledging the loyalty of Germany. Briand followed with a felicitous speech extolling the prospect of durable peace between France and her age-old enemy. On September 11 came Spain's formal notice of withdrawal from the League, but this was destined to be reconsidered (March, 1928) before it became effective. The Assembly then proceeded to adopt the plan for remodeling the Council as outlined by the committee, adding to it, however, a provision that the Assembly might, if it saw fit, change the entire complement of non-permanent members. Not only was the League now a more democratic organization, but it likewise embraced all of the ex-enemy powers except Turkey. In 1927 Germany was allotted a representative on the Permanent Mandate Commission. Surely much water had flowed under the bridge since 1919.

Resuming the story of the long struggle for disarmament and security, it may be noted that, at a conference of 45 states held at Geneva, a convention was signed (June 17, 1925) providing (when duly ratified) for the establishment of a general system of supervision and publicity for the international trade in arms, munitions, and implements of war, and a special system for areas where measures of this kind were generally recognized as particularly necessary. A protocol signed the same day, prohibiting the use of asphyxiating, poisonous, or other gases and of bacteriological methods of warfare, came into force for certain states (e. g., France) on Apr. 2, 1927, with others acceding subsequently. Preliminary investigations were set on foot to facilitate the ultimate suppression of private manufacture of arms and munitions. On Sept. 26, 1925, the Council established the preparatory commission for the Disarmament Conference which, during the ensuing years, continued the study of the armaments problem.

The negotiation of the Locarno Pact and the adhesion of Germany to the League gave a new impetus to the Assembly's continuous attempt to realize the formula "arbitration, security, and reduction of armament." The Seventh Assembly stated that the principles of conciliation and arbitration and "security by the mutual guaranteeing of states against any unprovoked aggression," should "govern the policy of every civilized nation."

The Eighth Assembly (1927) declared in a resolution: (1) That all wars of aggression are and shall always be prohibited; (2) that every pacific means must be employed to settle disputes of every description, which may arise between states; and (3) . . . that the states members of the League are under an obligation to conform to these principles. A new Committee on Arbitration and Security was appointed whose essential duty should be "to consider . . . the measures capable of giving all states the guarantees of arbitration and security necessary to enable them to fix the level of their armaments at the lowest possible figure in an international disarmament agreement." This Committee submitted to the Ninth Assembly (1928) a series of reports and draft conventions which were perfected by it. The result was a multilateral general act; and three model bilateral conventions for conciliation, arbitration, and judicial

settlement, a model collective treaty of mutual assistance, a collective and bilateral treaty of nonaggression, and a model treaty to strengthen the means of preventing war. Meantime, the multilateral Briand-Kellogg Pact for the renunciation of war had been signed at Paris (Aug. 27, 1928) further altering the political conditions in which the armament problem was envisaged. The drafting of the Young plan for definitive solution of the Reparation problem (June 7, 1929) prefigured further progress toward European amity. Moreover, the long-drawn-out and tortuous Anglo-American negotiations on limitation of naval armaments took a definite turn for the better in July, 1929.

During the years 1920-29, while wrestling with the thorny problem of achieving security and reducing armament, the League of Nations was simultaneously experimenting with its machinery and developing a technique for the adjustment of specific disputes between nations in accordance with Articles 11 to 17 of the Covenant. This system did not contemplate handling any dispute until the resources of direct negotiation between the parties should be exhausted. Moreover, as it proved, not all wars or threats of war were referred to the League for action—e.g., the Russo-Polish War and the Greco-Turkish War. The explanation for the undoubted impotence of the League in these and other instances is to be sought in the fact that the Allied Powers strove, somewhat unsuccessfully on the whole, to deal through the Council of Premiers or Conference of Ambassadors with questions arising from the peace settlement. Civil wars, such as the momentous revolutionary upheaval in China, were outside of the jurisdiction of the League.

Nevertheless, despite some discouraging setbacks, the League of Nations had a few not inconspicuous achievements to its credit. A controversy between Finland and Sweden over the Åland Islands (see FINLAND and SWEDEN, under *History*) was successfully adjusted (1920-22); the intervention of the League in the Albanian question (see ALBANIA) was marked by at least temporarily beneficial results (1921-23); and the compromise solutions of the question of partitioning Upper Silesia between Germany and Poland (1921-22) and of the possession of Mosul at issue between Turkey and Great Britain as mandatory for Iraq (1924-26) were both fairly statesmanlike. A bitter controversy between Poland and Lithuania over Vilna (q.v.) was less satisfactorily handled (1920-24), though a dispute between the same two nations over the port of Memel (q.v.) was settled (1924). A Greco-Bulgarian border clash which developed to the verge of belligerency was expeditiously and firmly settled (1925). Most of the foregoing topics are discussed elsewhere in these volumes either separately or in the articles on the individual countries.

Undoubtedly, the most thorough-going and disheartening rebuff which the League experienced resulted from the bellicose and defiant attitude of Italy during the Corfu incident (August-September, 1923). It is important to note that, throughout its career in settling controversies, the council never used or threatened to use military or economic warfare, but rather placed reliance upon persuasion, conciliation, tactful guidance of direct negotiation, and at most the mobilization of public opinion. It was not the super-state of perfervid 1919 imagination.

As the League of Nations was thus beginning to develop the prestige and integrity of an enduring institution, the policy of the United States government toward it was undergoing substantial modification. The attitude of "fearsome aloofness," of the early Harding-Hughes régime was impossible of continuance. American collaboration with the League, its secretariat, its committees, commissions, and conferences, proved neither contaminating nor entangling and what originated as a grudging experiment subsequently elicited approval and even encouragement. If the evolution of the League did not correspond in all respects with the prediction of Woodrow Wilson, it certainly had not fulfilled the dire prophecies of its opponents. Moreover, it should be pointed out that Wilson himself had "particularly emphasized the importance of relying on experience to guide subsequent action." The future had yet to reveal whether or not the League of Nations would draw the remaining non-member states (the United States, Russia, Turkey, Mexico, etc.) into its fold, but if no millennium had dawned, at least the lesson of Armageddon had not been wholly lost.

**Bibliography.** In the following list are given the more significant and general works dealing with the League of Nations: R. S. Baker, *Woodrow Wilson and World Settlement*, 3 vols. (Garden City, N. Y., 1922); J. S. Bassett, *The League of Nations* (New York, 1928); O. Howard-Ellis, *The Origin, Structure, and Working of the League of Nations* (Boston, 1928), to be followed by two cognate volumes by the same author; C. P. Howland, *Survey of American Foreign Relations-1928* (New Haven, 1928), a valuable and comprehensive study of the period, 1917-27; D. P. Myers, "Nine Years of the League of Nations 1920-28," *World Peace Foundation Pamphlets*, vol. xii, no. 1 (Boston, 1929); D. H. Miller, *The Drafting of the Covenant*, 2 vols. (New York, 1928); E. M. House and C. Seymour, *What Really Happened at Paris* (New York, 1921); C. Seymour (ed.), *The Intimate Papers of Colonel House*, 4 vols. (Boston, 1926-28); H. W. Temperley (ed.), *A History of the Peace Conference of Paris*, 6 vols. (1920-24).

**LEATHER.** The leather industry in the United States in the period from 1914 underwent many vicissitudes in which the production of live stock, the demands due to the World War, and the general changes in business and industrial conditions figured. In 1919 and 1920, as a result of the War, which developed a huge production and accumulation of hides, skins, and leathers, there was a drastic deflation and hides were forced upon the market. Furthermore, with the increased use of the automobile and changes of style in footwear, new kinds of leather were required, while there was a decline in the output of harness leather. At the same time, technical improvements have been made in tanning and leather-making technology and processes.

The United States ranks first among the nations of the world in the production of leather, tanning as it does at least 50 per cent of the world's output. Its total production of finished leather is estimated to be equal to that of all the rest of the world combined, but nearly half of the cattle hides and calfskins are imported, and almost all the sheep, lamb, goat, and kid skins. The production of cattle hides, cattle skins, and sheepskins in the United States has not increased proportionately with the demand for

leather, and American tanneries are forced to import a considerable amount of material. For example, in 1928, while there was a large production of hides and skins (the number reached 135,895,000), yet about 45 per cent of the raw material entering into the manufacture of leather was imported, with the exception of goatskins, of which 98 per cent was imported. Normally, in the United States, there is a greater production of leather than the domestic markets can consume and this production must be taken care of by substantial exports, which in 1919 reached a peak value of \$218,783,300, declining to \$31,787,275 in 1921, and rising to \$55,165,000 in 1928. The United States easily leads the nations of the world in leather exports, Germany being second. It is quite apparent that the condition of the leather industry is more or less connected with world conditions, and in few American industries are there such serious fluctuations as in those connected with the production of leather.

In the United States, the finished product of the tanning industry consists of whole hides, sides, backs, bends, butts, and offal skins, and the four main groups of finished leather products divided into: (1) sole, belting, side upper, patent, harness, bag, and upholstery; (2) calf and kip upper leather; (3) goat and kid upper and fancy leather; (4) sheep and lamb upper, lining, glove, and fancy leather. The leather industry, according to the Bureau of the Census, 1925, ranked eleventh among the 16 leading industries of the United States when considered from the viewpoint of the total value of the product. As already stated, it is necessary for the United States to import approximately 50 per cent of the calfskins, 30 per cent of the calf hides, 99 per cent of the goatskins, and 63 per cent of the sheepskins used in its tanning industry; or, in other words, fully 50 per cent of the hides and skins entering into international trade are taken by the United States, exclusive of those originating in the country.

In 1927 the American tanning industry consumed 132,217,000 hides and skins, of which 77 per cent was used in the production of shoe leather; 5 per cent, in fancy bookbinding and kindred leathers; 10 per cent, in glove leather; 3 per cent, in belting, bag, harness, and upholstering leather; and the remaining 5 per cent in miscellaneous leathers. The consumption of the various hides and skins in 1923 was as follows: cattle hides, 21,820,000; calf and kid skins, 16,987,000; goat and kid skins, 50,736,000; sheep, lamb, and cabretta, 30,062,000; and other hides and skins, 7,556,000.

The American leather production in the period from 1914 to 1928, as summarized by the Bureau of the Census, is given in the table on page 922.

The imports of raw hides and skins into the United States in 1927 amounted to 447,142,000 pounds, valued at \$112,846,000, the imports coming from widely scattered sources with South America and particularly Argentina ranking as the chief source of imported cattle hides; and Asia, especially British India and China, of goatskins; New Zealand, United Kingdom, and Argentina being the principal sources of sheepskins and lamb skins.

The exports of leather in 1927 totaled \$54,004,000, which was the largest amount since 1919 when the extraordinary figure of \$218,783,300 was attained. In 1914 the exports from the United States totaled \$44,975,996. It will be apparent from the outline summary of the imports



## LEATHER PRODUCTION, BY PRINCIPAL CLASSES

[All figures in thousands of units specified]

Class	1914	1921	1922	1923	1924	1925	1926	1927	1928
Sole leather (cattle)	sides 18,098	18,063	17,735	18,732	14,640	14,879	13,615	15,829	16,198
Belting leather	butts 974	1,195	1,014	1,471	1,231	1,572	1,852	1,891	1,694
Side, upper, and patent (cattle)	sides 10,049	14,874	22,904	24,226	23,183	23,966	22,936	21,848	19,316
Harness leather	do 2,944	811	1,377	1,555	1,269	1,288	1,169	1,016	818
Bag, case, and strap	do 1,005	821	1,249	1,200	1,056	1,175	1,183	1,105	812
Upholstery *	hides 654	414	716	743	649	626	601	502	470
Calf and kip	skins 16,587	14,988	15,686	18,474	16,455	13,878	15,744	16,987	15,618
Goat and kid	do 34,627	35,058	48,905	47,854	35,895	42,485	49,776	50,786	54,854
Sheep and lamb	do 27,952	24,655	36,573	48,795	38,781	33,089	31,665	36,062	39,015

\* Includes "whole-hide grains" and "machine buffed" only. For 1914 "whole-hide grains" only.

\* Figures are not strictly comparable with later years, owing to the omission of certain classes in 1914 which were not called for on the schedule.

Source: Bureau of the Census.

and exports of the United States that the industry is vitally concerned with the question of tariff duties and that hides and leather must be carefully considered in any legislation in this field. The situation is complicated by the diverse interests represented and these schedules were seriously discussed in the preparation of the tariff bill of 1929.

The United States Census of Manufactures

industry, \$1,768,000,000, finished leather products were valued at \$1,306,000,000, or 74 per cent of the total. Of the finished products, the boot and shoe industry represented 70.8 per cent; boot and shoe cut stock and findings not made in shoe factories, 10.4 per cent; trunks, suitcases, and bags, 4.7 per cent; pocketbooks, purses, and card cases, 3.3 per cent; gloves and mittens of leather, 2.8 per cent; leather belting, 2.4 per cent; sad-

## LEATHER AND LEATHER MANUFACTURES

Year	Estab-lish-ments	Wage earners (average number)	Primary horse-power	Wages	Cost of materials In thousands of dollars	Value of products * of dollars	Value added by manufacture
1914	6,758	307,060	811,194	169,358	753,135	1,104,595	351,460
1919	6,397	349,362	382,537	363,458	1,713,806	2,610,231	896,425
1921	4,813	280,071	( <sup>b</sup> )	314,412	934,398	1,544,186	609,788
1923	4,868	344,545	412,998	388,630	1,083,845	1,880,085	796,740
1925	4,264	315,288	413,759	356,246	1,015,123	1,767,581	752,458

\* This value includes much duplication.  
Source: Bureau of the Census.<sup>b</sup> Not called for in schedule for 1921.

for 1925 gave for leather and leather manufactures a total production of goods valued at \$1,768,000,000, though it was stated that this figure involved considerable duplication. The output of the tanning industry for 1925 was valued at \$462,000,000, which was a decline in value of 5.8 per cent from 1923. The figures of the Census for leather and leather manufactures are given in the accompanying table.

In the total value of products for the leather

industry and harness, 2.3 per cent; and leather goods not otherwise specified, about 3 per cent. Among the States, Massachusetts ranked first in 1925, while New York and Missouri were second and third, respectively. The accompanying table gives a comparative view of the United States leather manufacturing industry for specific years with comparative totals. See **BOOTS AND SHOES; LIVE STOCK.**

## LEATHER MANUFACTURES: TOTALS AND SELECTED INDIVIDUAL INDUSTRIES

Year and industry	Estab-lish-ments	Wage earners (average number)	Primary horse power	Wages	Cost of materials	Value of products	Value added by man-ufacture
					In thousands of dollars		
1914	6,017	251,124	139,460	137,443	468,890	737,398	268,508
1919	5,717	276,886	164,776	275,248	1,067,285	1,681,639	614,354
1921	4,205	231,116	( <sup>a</sup> )	256,671	656,673	1,160,821	504,148
1923	4,271	284,842	182,811	314,844	761,595	1,391,187	629,592
1925	3,732	262,245	191,081	289,484	708,489	1,305,567	597,078
<b>1914</b>							
Belting leather	151	2,951	7,885	2,070	15,480	23,036	7,556
Saddlery and harness	2,551	12,969	10,362	7,996	33,086	53,559	20,473
Trunks, suitcases, and bags	561	9,911	7,510	5,540	13,626	26,472	12,846
<b>1923</b>							
Belting leather	169	3,160	9,075	3,895	24,569	37,723	13,154
Saddlery and harness	472	6,017	7,761	6,016	24,460	42,113	17,653
Trunks, suitcases, and bags	505	11,441	7,269	13,520	32,837	63,023	30,186
<b>1925</b>							
Belting leather	168	2,644	6,889	3,505	18,868	31,811	12,043
Boot and shoe cut stock, not made in boot and shoe factories	244	7,197	7,959	7,078	65,646	84,220	18,574
Boot and shoe findings, not made in boot and shoe factories	326	8,005	15,419	9,695	29,248	52,064	22,816
Boots and shoes, other than rubber	1,460	208,992	139,569	225,788	481,632	925,363	443,751
Gloves and mittens, leather	247	8,378	3,852	7,814	20,021	37,161	17,143
Pocketbooks, purses, and cardcases	190	6,826	1,356	9,022	22,442	43,105	20,663
Saddlery and harness	258	4,570	5,021	5,000	18,776	30,084	11,308
Trunks, suitcases, and bags	475	10,848	7,693	13,226	31,382	61,224	29,842
Leather goods, n. e. s.	304	6,685	3,223	7,396	20,474	40,512	20,038
Blackings, stains, and dressings	171	1,869	2,659	2,165	9,733	25,005	15,322

\* Not called for in schedule for 1921.

Source: Bureau of the Census.

**LEBANON, GREATER.** A State proclaimed in Sept. 1, 1920. See SYRIA.

**LE BARON, WILLIAM** (1883- ). An American editor and playwright, born at Elgin, Ill. He studied at the University of Chicago and at New York University, and served as managing editor of *Collier's Weekly*, director general of Cosmopolitan Productions (1919-24), and associate producer of the Famous Players-Lasky Corporation (1924-27). Since 1927 he has been vice president of the Film Booking Office Studio. He was the author of several successful plays, including *The Very Idea*; *Her Regiment*; *Back to Earth*; *Apple Blossoms*; *Nobody's Money*; *The Scarlet Man*; and *The Love Letter*.

**LEBLOND, MARIUS** (1877- ) and **ARY** (1880- ). French brothers who formed a literary partnership, signing their works Marius-Ary Leblond. Their novel, *En France*, won the Prix Goncourt for 1909. After the World War, their books were often full of a lofty idealism. They also wrote the sociological studies: *La grande île de Madagascar* (1907); *La Pologne vivante* (1910); and *La France devant l'Europe* (1913). Their novels include *La Sarabande* (1904); *Le miracle de la race* (1918); *Ulysse, café, ou l'histoire dorée d'un noir* (1924); *L'amour sur la montagne* (1925); and *Les martyrs de la république*, a contemporary novel (3 vols., 1926-27). Other works include *La société française la troisième république d'après les romanciers contemporains* (1905); *Peintres de races*, a history of painting (1909); *Gallieni parle* (2 vols., 1920), and *Fétiches*, short stories (4th ed., 1923).

**LE BON, le bon', GUSTAVE** (1841- ). A French ethnologist and psychologist (see Vol. XIII). His most important later works were: *La vie des vérités* (1914); *Enseignements psychologiques de la guerre européenne* (1915); *Premières conséquences de la guerre: transformation mentale des peuples* (1st series, 1916; 2d series, 1917); *Hier et demain: pensées brèves* (1918); *Les opinions et les croyances* (1918); *Psychologie des temps nouveaux* (1920); *Le déséquilibre du monde* (translated as *The World Unbalanced*, 1923); and *L'évolution actuelle du monde; illusions et réalités* (1927).

**LE BRAZ, le brâs, ANATOLE** (1859-1926). A French poet and novelist (see Vol. XIII). His later works included *La Bretagne*, an anthology (1925), and *Poèmes votifs* (1926).

**LEE, JAMES MELVIN** (1878- ). An American editor, born at Port Crane, N. Y. He was graduated from Wesleyan University in 1900 and in 1901-02 taught at the Western Reserve Seminary in Ohio. He then entered the newspaper business and was editor of many periodicals, including *Outing*, *Leslie's Weekly*, and *Judge*. He was lecturer on journalism at the New York University in 1910-11, and in the latter year became director of the department of journalism in that university. He wrote *How to Be Self-supporting at College* (1903); *History of American Journalism* (1917); *Opportunities in the Newspaper Business* (1919); *Business Ethics* (1925).

**LEEDS.** An important manufacturing city of England and centre of the British woolen and wholesale clothing trade. The population at the census of 1921 was 458,232; in 1927 it was estimated to be 482,600. The municipal area is 30,137 acres (more than 47 square miles). In addition to factories for the manufacture of rope,

thread, linen, glass and earthenware, machinery and machine tools, steam engines, and railway wagons, the city has the largest share of the leather trade of Great Britain. The city government is in the front rank among progressive local governing authorities. It has provided extensive hospital accommodations, for the treatment of infectious diseases and tuberculosis, and the treatment of children up to five years of age. In addition, there is an institution for the employment of tubercular persons. The water supply is obtained from reservoirs in the Washburn Valley, with a storage capacity of 3,276,000,000 gallons, and the daily consumption is 18,266,000 gallons. A new reservoir has been constructed at Leighton with a capacity of 1,050,000,000 gallons. In 1922 the corporation purchased the Temple Newsam estate, comprising 935 acres, together with the historic mansion of Temple Newsam, birthplace of Lord Darnley, the ill-fated husband of Mary, Queen of Scots. The mansion is on the site of a preceptory of the Knights Templars and was the original of Templestowe in Scott's *Ivanhoe*. It contains a fine collection of books and paintings, among which are portraits of Darnley and Mary.

**LEE OF FAREHAM, ARTHUR HAMILTON, FIRST VISCOUNT** (1868- ). A British soldier and public official, who was born at Bridport and educated at Cheltenham and Woolwich. He entered the Royal Artillery in 1888 and remained in the army until 1900, when he had reached the rank of brevet major. He served in various stations, and was in Canada from 1893 to 1898 as professor of strategy and tactics at the Royal Military Academy, during the period also organizing a military survey of the Canadian frontier and acting as special correspondent for the *Daily Chronicle* during the Klondyke gold rush. He then was military attaché with the U. S. Army during the Spanish-American War (1898), and at Washington (1899). On retiring from the army, he entered Parliament as a Conservative (1900-18), serving as Civil Lord of the Admiralty (1903-05), chairman of the parliamentary Aerial Defence Committee (1910-14), parliamentary military secretary to the Ministry of Munitions (1915-16), personal military secretary to Lloyd George, who was then Secretary of State for War (1916), and director-general of food production (1917-18). In 1918 he was made a baron, and he entered the cabinet in the following year as Minister of Agriculture and Fisheries (1919-21), later becoming First Lord of the Admiralty (1921-22). He was a member of the Imperial Cabinet (1921), a delegate to the Washington Conference (1921-22), and served as chairman of the Royal Commissions on the Public Services in India (1923-24) and on Thames Bridges (1926). In 1914 he re-entered the army for a time as a colonel. He received many honors, including that of Knight of the Grand Cross, Order of the Bath (1929), was prominent in the world of art as a member of museum boards, and in 1921 gave the Chequers estate, used as the country seat of the Premier, to the nation.

**LEEWARD ISLANDS.** A group of islands in the British West Indies, constituting a colony. They comprise Antigua, Montserrat, St. Christopher, and Nevis (usually called St. Kitts), a part of the Virgin group, Dominica, and their dependencies. Total area, 715 square miles; population, 122,242 in 1921 (127,193 in 1911). The leading products are sugar, mo-

lasses, lime-juice, coconuts, and fruits. Imports for 1913-14 and 1927 were £588,362 and £842,464. Exports for the same years totaled £563,963 and £662,492. Revenues and expenditures of government follow for 1926-27 (1913-14 figure in parentheses): revenue, £289,393 (£174,331); expenditure, £259,037 (£171,128); public debt, on Mar. 31, 1927, £278,850 (£244,689).

**LE GALLIENNE, EVA** (1899- ). An actress born in London, England, the daughter of Richard Le Gallienne. She was educated in France at the Collège Sevigné and started her stage career in London at the Prince of Wales Theatre in 1915 in *The Laughter of Fools*. The next year, she went to New York and gave her first American performance in *The Melody of Youth*. Other successes included: *McLazarus* (1916-17); *Off Chance* (with Ethel Barrymore 1917-18); *Not So Long Ago* (1920-21); *Liliom* (1921-22); *The Swan* (1923); *The Assumption of Hannele* (1923); *Jeanne d'Arc*, by Mercedes de Acosta (1925); *The Call of Life*, by Schnitzler (1925); *The Master Builder*, by Ibsen (1925-26). Miss Le Gallienne was the founder and director of the Civic Repertory Theatre, which was opened in New York in 1926. She edited *Civic Repertory Plays* (1926).

**LEGGE, ALEXANDER** (1866- ). An American manufacturer and public official, born in Dane County, Wisconsin. His family moved to a Nebraska farm while he was a youth and he worked there for ten years before entering the employ of the McCormick Harvester Company at Omaha in 1891. He rose rapidly in the company and its successor, the International Harvester Company, becoming general manager in 1913 and president in 1922. During the World War, he served as chairman of the War Industries Board and also as manager of the Allied Purchasing Commission. In 1929 he resigned as president of the International Harvester Company to become chairman of the Federal Farm Board by appointment of President Hoover.

**LEGINSKA, ETHEL** (real name LEGGINS) (1890- ). An English pianist, born at Hull. After studying four years at the Hoch Conservatory in Frankfurt, she continued her studies with Leschetizky in Vienna for three years more. Her successful début in London was followed by extended tours of Europe. She made her American début in New York (January, 1913), but did not establish herself as a really great pianist until the next year, when she began to play colossal programmes, well calculated to show her transcendent technique and masculine power. Overwork brought on a nervous breakdown in 1917, obliging her to retire temporarily from the concert stage. During her convalescence, she became fired with the ambition to win laurels as a composer, and for this purpose studied composition with Ernest Bloch in New York. She returned to the concert stage in 1921, but her appearances as a pianist after that time were rather infrequent. In 1924 she made her début as an orchestral conductor in Munich, with the Konzertverein, appeared as guest-conductor with the Conservatory Orchestra in Paris and the London Symphony Orchestra. The following year, she returned to the United States, making her American début as conductor with the New York Symphony Orchestra (January 9), and won success as a conductor also in Boston and at the Hollywood Bowl. In 1926 she became the regular conductor of the Boston Philharmonic Orchestra and the Boston Women's Symphony

Orchestra, and since 1927 has also made regular appearances as guest-conductor of the Women's Symphony Orchestra of Chicago. Her compositions, which are decidedly futuristic, consist of songs, pieces for piano, *Four Poems* (after Tagore) for string quartet, a symphonic poem, *Beyond the Fields We Know*, and *Four Barbaric Subjects* for orchestra.

**LEGION, AMERICAN.** A society of veterans of the World War, organized Mar. 17, 1919, in Paris, France, by members of the Army and Marine Corps serving with the American Expeditionary Forces. On Sept. 16, 1919, it was incorporated by Act of Congress, declaring itself to be "patriotic, nonpartisan, nonpolitical, non-military, and permitting no distinctions due to rank or place of service." Membership was open to any soldier, sailor, or marine who served honorably between Apr. 6, 1917, and Nov. 11, 1918, and women enlisted or commissioned in any branch of service during that period. The Legion held its first national convention at Minneapolis, Minn., Nov. 10-12, 1919. It adopted a constitution, elected Franklin D'Olier, of Philadelphia, national commander, and began its career as an established body.

The Legion has conducted a campaign against political radicalism, and at the seventh annual convention, in Omaha, Nebr., in 1925, repeated its conviction that the United States should maintain forces adequate for defense, and that a Federal law should provide for a universal draft in war time. The Legion pronounced itself in favor of the United States, adhering to a permanent court of international justice, co-operating with the League of Nations, and taking part in other international conferences. It recommended expansion of aviation, the establishment of an aerial mail service between the United States and Panama, and the creation of a medical corps within the Veterans' Bureau. John M. McQuigg was elected to succeed James A. Drain as commander.

The Legion completed, in 1926, the \$5,000,000 fund which it had originated the previous year, to endow work for veterans and orphans of ex-service men. At the convention in Philadelphia, Pa., it again endorsed the principles of the National Defense Act of 1920, but declined to restate its approval of a court of international justice. General John J. Pershing was elected honorary commander of the Legion for life, and Howard Paul Savage was made national commander.

The convention of 1927 was held in Paris, France, September 19-24, where the 20,000 members and their families, including the 1077 delegates who attended, were entertained by the French government and by veterans' organizations. At the close of the convention, 250 members made a good-will trip, and were received in Rome by King Victor Emmanuel III, in Brussels by King Albert I, and in London by King George V. During the year, the Legion had carried out a programme of community service, and it again expressed itself in favor of a universal draft bill. Edward E. Spafford was elected commander.

In 1928 the convention met at San Antonio, Texas, and a review of the year's work showed that \$2,788,301.15 had been recovered for the disabled; and that the Legion had been influential in advancing child-welfare legislation; and in the enactments of a Federal allotment of \$15,000,000 for new hospitals, a bill pro-

viding for the retirement of disabled emergency officers, and liberal improvements in the Veterans' Bureau Act. The Legion also worked for the passage of a universal draft bill, and continued its community service. Paul V. McNutt was made commander. Following the convention, a committee of Legionnaires visited Mexico, where they were received by President Calles.

The membership of the Legion increased from 450,000 in 1919 to 751,721 in 1928. The American Legion Auxiliary, formed in 1921 by the mothers, wives, sisters, and daughters of Legion members numbered 297,957 in 1928. Other organizations connected with the American Legion are La Société des 40 Hommes et 8 Cheveaux, and La Boutique des Huit Chapeaux et Quarante Femmes. The official publication is the *American Legion Monthly*. Permanent headquarters are at the War Memorial Building in Indianapolis, Ind.

**LEGUIA**, lă-gō'yá, AUGUSTO B. (1863- ). A Peruvian President (see VOL. XIII). On May 18, 1919, a disputed election led to the arrest of Dr. José Pardo, former President, and the assumption of that office by Leguia, whose election was later confirmed and legalized by the Peruvian Congress. The constitution was twice changed so that he might remain in office: in 1923 to permit a President two consecutive terms, and in 1927 to allow unrestricted reelection. He was reelected in 1924 and again in 1929, his term to expire in 1935. See PERU, under *History*.

**LEHÁR**, lă'hār, FRANZ (1870- ). An Austrian composer (see VOL. XIII). He added to the list of his works: *Der Sterngucker* (Vienna, 1916); *Wo die Lerche singt* (Budapest, 1918); *Die blaue Mazur* (Vienna, 1920); *Die Tangokönigin* (Vienna, 1921); *Frühling* (Vienna, 1922); *Frasquita* (Vienna, 1922); *La danza delle libellule* (Milan, 1922); *Die gelbe Jacke* (Vienna, 1923); *Olo-Olo* (Vienna, 1924); *Paganini* (Vienna, 1925); *Friederike* (Berlin, 1928). Consult E. Decsey, *Franz Lehár* (Vienna, 1924).

**LEHIGH UNIVERSITY**. A nonsectarian institution for the higher education of men at Bethlehem, Pa., founded in 1866. The student enrollment increased from 672 in 1914 to 1477 in the autumn of 1928, and for the summer session of the latter year, there were 466 registered; the faculty increased from 75 to 155 members; and the library from 133,200 to 127,902 bound volumes and 51,307 pamphlets. The productive endowment in 1914 was \$1,314,000, and the income \$240,000, as compared with an endowment of \$5,123,112, and an income of \$1,125,158, in 1928. Coppée Hall, named in memory of the first president of the University, Dr. Henry Coppée, and Taylor Gymnasium were built in 1914; an extension to the chemistry laboratory was completed in 1920; and the Alumni Memorial Administration Building, a memorial to the men of the University who died in the War, was completed in 1924. During 1926 a building for the college of business administration was erected, linking Christmas and Saucon halls; a building was renovated for the Armory; and an additional large athletic field was acquired. In 1927 announcement was made of a gift of \$1,000,000 from James Ward Packard, founder of the Packard Motor Car Company, to be used for the erection of an electrical and mechanical engineering laboratory, the corner stone of which was laid June 9, 1928. Construction was begun

in September of the latter year on a new library structure designed to increase the library facilities approximately fourfold. Evening schools in business administration and naval architecture were established in 1920; a university health service, providing dispensary service and annual physical examination for all students, was opened in 1923; and an endowment campaign for \$4,000,000 was started. In September, 1925, a new curriculum was inaugurated, leading to the degree of bachelor of science in industrial engineering. This course was offered to meet the needs of those students who intend to enter industries essentially technical in character, but who do not intend to go into the mechanical or technical departments. Charles Russ Richards, M.M.E., Eng.D., LL.D., succeeded Henry Sturgis Drinker, LL.D., E.M., as president in 1922.

**LEHMANN**, lă'mān, LILLI (1848-1920). A German dramatic soprano (see VOL. XII). She died in Berlin, May 17, 1920. In the full possession of her glorious powers, she continued her dramatic career until 1914, when she bade farewell to the stage as Donna Anna in Mozart's *Don Giovanni* at the Salzburg festival, but continued her recitals till 1921. After that, she still taught almost to the day of her death. During her career, she actually sang on the stage 170 rôles in 114 operas, in German, Italian, and French, while her concert repertory included all the standard oratorios and over 600 songs. From all available records, it appears that no singer ever rivaled her in extent or variety of repertory. As a coloratura soprano, she equaled Patti or Melba, as an interpreter of Wagner, Materna, Sucher, or Klafsky. She combined all the supreme qualities of singer and actress: a glorious natural voice, faultless technique, fiery temperament, penetrating intelligence, queenly stage-presence, plasticity of pose, and grace of movement. Not only was she a high-priestess of art, but she also possessed, in an eminent degree, the gift of imparting the technique of her art to others, as is proven by such pupils as Olive Fremstad, Geraldine Farrar, Melanie Kurt, Marion Weed, and Florence Wickham.

**LEITH**, CHARLES KENNETH (1875- ). An American geologist, born at Trempealeau, Wis. He studied at the University of Wisconsin, and in 1900 became assistant geologist with the United States Geological Survey, which position he held until 1905. Meanwhile, he was called to the University of Wisconsin, where in 1903 he became full professor of geology. In 1905 he became lecturer on pre-Cambrian geology at the University of Chicago. Dr. Leith specialized on pre-Cambrian, structural, metamorphic, and economic geology, and is an accepted authority on the iron districts of the United States and on the origin of iron ores. During the World War, he was an adviser on minerals to the United States Shipping, War Trade, and War Industries boards (1918) and later (1919) to the American Commission to Negotiate Peace in Paris.

**LEJEUNE**, JOHN ARCHER (1867- ). An officer of the U. S. Marine Corps, who was born in Pointe Coupée Parish, La., studied at the Louisiana State University, and was graduated from the U. S. Naval Academy (1888). For two years, he was at sea as a naval cadet, being shipwrecked on the U. S. S. *Vandalia* in the hurricane at Apia, Samoa, in March, 1889. He was commissioned second lieutenant of the U. S. Marine Corps in 1890 and promoted through the

grades to brigadier general (1916). He commanded marines on board the *Cincinnati* in the Spanish-American War, on the Isthmus of Panama (1903-04), in the Philippines (1908-09), and during the capture of Vera Cruz, Mex., in 1914. In the next two years, he served as assistant to the commandant of the Marine Corps at Washington and in September, 1917, was appointed commander of the Marine Barracks at Quantico, Va. In the World War, he was on duty with the 35th Division in the Alsace sector in June, 1918; commanded the 64th Brigade, 32d Division, on the Swiss border, and the 4th Brigade (marines), and the 2d Division, A. E. F., from July 28, 1918, to Aug. 8, 1919. He took part in the battles of St. Mihiel, Blanc Mont Ridge (Champagne offensive), and Meuse-Argonne, and after the Armistice, in the march to the Rhine and the occupation of Coblenz bridgehead. He returned to the United States in command of the 2d Division in August, 1919. In 1920 he was placed in command of the Marine Corps as a major general. He was retired at his own request in July, 1929, effective November 12, and immediately took up new duties as superintendent of the Virginia Military Institute.

**LELAND STANFORD JR. UNIVERSITY.** See STANFORD UNIVERSITY.

**LEMANN, MONTE M.** (1884- ). An American lawyer, who was born at Donaldsonville, La., and graduated at Tulane University, New Orleans, and the Harvard Law School (1906). He was admitted to the bar in 1907 and practiced at New Orleans until 1918, when he was called to Washington to aid in settling legal problems that arose in connection with the World War. After six months of such service, he returned to New Orleans, where he continued practice, held a professorship of law in Tulane University, and became president of the Louisiana Bar Association. He has long advocated the simplification of our legal system. In May, 1929, he was appointed a member of the National Law Enforcement Commission by President Hoover. He has contributed articles to the *Cyclopaedia of Law*.

**LEMBERG.** See GALICIA and UKRAINE.

**LENGLEN, SUZANNE** (1899- ). A French tennis player, born near Paris and educated at the Institut Massena, Nice. She won the Women's Olympic singles championship in 1920 and was recognized as the greatest woman tennis player. Because of ill health, she was unable to defend her laurels in 1924 either at the English championships at Wimbledon or the Olympic Games at Paris, but with the exception of that year, she was champion of France and England from 1921 to 1925, and of France in 1926. In the following year, she became a professional player. She wrote *Lawn Tennis, the Game of Nations* (1925), and *The Love-Game*, a novel (1926). Consult *Suzanne Lenglen*, by Claude Anet (1927).

**LENIN. NIKOLAI (VLADIMIR ILYITCH ULYANOV)** (1870-1924). A Premier of Russia and leader of the Bolsheviks in the establishment of the Soviet government. He was born at Simbirsk on the Volga, the son of a counselor of state of the Government of Simbirsk. He was Greek Orthodox by religion and was educated at the Simbirsk Gymnasium and the University of Kasan. After 1890 he was a leader of the radical Social Democrats and, in 1903, when the Russian Social Democratic Congress, held in

London, split into Mensheviks (minority) and Bolsheviks (majority), Lenin became the leader of the latter faction. He agitated in various European countries, occasionally going back to Russia, and he attempted to turn the World War into a war against the bourgeois. He returned to Russia shortly after the March, 1917, revolution, and worked for the advent of the Bolsheviks, which he successfully engineered in November of that year. He was chairman of the Council of the People's Commissaries, head of the Communist Party, and managed to become the embodiment of the principles of the Soviet Republics. At the close of 1921, he became too ill to take a very active part in the government, so that others ruled in his name. On his death in January, 1924, his body was preserved and placed behind glass in the Kremlin at Moscow, his tomb becoming a Communist shrine. He wrote a great deal about his theories for newspapers and reviews, and made many speeches about them, which were published in 1928 as *Lenin Speaks*. A collected edition of his works was begun in 1927. Consult *Lenin*, by Leon Trotsky (1925); *Mara, Lenin, and the Science of Revolution*, by Max Eastman (1926); *Lenin and Gandhi*, by René Fülöp-Miller (1927), and *Lenin*, by Valeriu Marcu (1928). See RUSSIA, under *History*.

**LENINGRAD** (formerly Petrograd, Saint Petersburg). The most important commercial centre of Soviet Russia and former capital of the Russian Empire. The population at the census of 1926 was 1,614,008; in 1928 it was estimated at 1,676,800. After the October (1917) revolution, Leningrad was redivided into six districts: Central, Moscow-Narva, Volodarsky, Petrograd, Vasilevsky Ostrov, and Viborg. Leningrad was probably more greatly affected by the revolution and the consequent blockade than any other large Russian city. The shutting off of foreign trade, the shortage of fuel and provisions which caused thousands to leave the city, the heavy loss of life in the World War and the revolution, and the moving of the capital to Moscow resulted in reducing the population of the city from about 2,415,000 at the beginning of 1917 to 722,229 in 1920. With the advent of a new economic policy and the beginning of the reconstruction process in 1921, the population began gradually to increase, reaching 1,067,328 in 1923.

**Commerce and Industry.** The port of Leningrad has played an important part in the city's economic revival. Before the World War, it handled about 16 per cent of Russia's total foreign trade. In 1928 this figure had increased to 19.4 per cent, owing to the fact that part of the trade formerly going by way of other Baltic ports had been acquired by Leningrad. In 1927 the amount of freight handled by the port amounted to 1,850,000 tons, as compared with 429,000 tons in 1921. The number of vessels using the port increased from 308 in 1921 to 1804 in 1927. There are two channels for the entry of ships into the harbor: an artificial sea canal 19.8 miles long and 350 feet wide for vessels of deep draught and a smaller canal for vessels of a draught of only 11 feet. The grain and timber harbor has 10 quays, allowing for the simultaneous berthing of 40 steamers. There are also a coal harbor with an area of 4,900,000 square feet and a sea quay for oil cargoes and large timber logs. The total length of the Leningrad quays is 21,000 feet. The warehouses ac-



commodate about 100,000 tons. Port improvements since 1923 have included dredging the larger sea canal to a depth of about 9.5 meters (31 feet), so that vessels with a draught up to 28 feet may enter the harbor, the development of railway lines, the building of six reinforced concrete warehouses, and the construction of additional piers and a new large harbor on Gladky Island for the handling of timber exports.

The rebuilding of the economic life of Leningrad, has been largely the result of an extensive electrification programme. The value of products manufactured increased from 700,000,000 rubles in 1924-25 to 1,500,000,000 rubles in 1927-28. The textile industry accounted for 17.4 per cent, the clothing industry, 9.2 per cent, and the shoe industry, 4.7 per cent of the total output. The manufacture of electrical apparatus, such as high-powered generators and turbines, etc., which in 1913 accounted for only 2.5 per cent of the total production, made up 8.6 per cent in 1927. In 1926-27, 232,502 workers were employed in 485 manufacturing establishments in Leningrad. Their average monthly wage amounted to 80.74 rubles which, reduced to pre-war value, indicated that wages were 25 per cent higher than those prevailing in 1913.

**Educational Institutions and Museums.** Leningrad has 50 higher educational institutions, 151 scientific institutes, and 102 scientific societies serving the entire country. Among these institutions, the more important are the All-Union Academy of Science, the Pulkova and the Physical observatories, the Physico-Technical Institute, the Institute of Decorative Arts, the Leningrad Institute for the Science of Books, the Institute for the Observation of Childhood, and the Leningrad Communist University founded in 1921 and housed in the Uritsky (formerly the Taurida) Palace. The Leningrad Government Law Courts have been erected on the site of the building of the famous Third Division of Secret Police which, after its organization in 1838, led the fight against the revolutionary movement.

The museums which have been founded by the Soviet government are playing an important part in the life of the people. The Museum of Art Culture, founded in 1918, is a centre of modern art. The Museum of the Red Army, founded in 1920, illustrates the development of the army. The Permanent Exhibition of the Supreme Economic Council spreads industrial and technical information among the workers. The Central Theatrical Museum, established in 1918, is a means of preserving the chief memorials of the Russian theatre. The Museum of Comparative Religious Thought, opened in 1922, contains originals and reproductions of various objects of worship from Egypt, Assyria, Babylonia, India, and some of the Siberian tribes. The Central Geographical Museum, founded in 1919, depicts Russia's physical characteristics. The Museum of Ways of Communication, founded in connection with the Institute of Engineers, illustrates the historical development of transportation. The Museum and State Institute of Ceramics, in connection with the State Porcelain Factory, is playing an important part in the development of a new type of Russian ceramic art. The Winter Palace has been transformed into a Museum of the Revolution, the chief part of the collection consisting of objects connected with the Russian Revolution and various insur-

rections of the nineteenth century; considerable space has been allotted also to the revolutions of western Europe. In this palace, the apartments of Nicholas I, Alexander II, and Nicholas II are shown as historical memorials. The Tusupov Palace, in the basement of which the monk Gregory Rasputin was murdered in December, 1916, was made into a museum in 1919.

**History.** At the outbreak of the World War, the German-sounding name of the city, Saint Petersburg, was changed to Petrograd, which is the Russian expression meaning the City of Peter. In consequence of the expanded war industry, the number of industrial workers grew from 233,000 in 1914 to 378,000 in 1917. Leningrad was the fountain head of the social revolution. The Soviet of Workingmen's and Soldiers' Delegates, formed immediately after the outbreak of the revolution in February, 1917, was the model for the formation of councils throughout Russia. After the return of Lenin and Trotsky from exile, the Bolsheviks gained in power and used the Red Guards to execute a *coup d'état* against the Kerensky provisional government. On Nov. 8, 1917, the second All-Russian Congress of Soviets recognized the Soviet government. A Council of People's Commissars was established, with Lenin as Premier and Trotsky as Commissar for Foreign Affairs. The attacks of Kerensky and Krasno which followed shortly after the establishment of the Soviet power were defeated, as well as the attacks of General Yudenitch in the summer and autumn of 1919. The advance of the Germans into the Baltic provinces on the reopening of hostilities in February, 1918, brought about the removal of the Soviet government to Moscow. The death of Lenin, whose life had been so closely connected with the revolutionary history of the city, was the occasion for changing its name to Leningrad in March, 1924. See RUSSIA.

**LENORMAND, HENRI RENÉ (1882- )**. A French dramatist who was born in Paris and educated at the Lycée Janson-de-Sailly. He was successful in his introduction of psychoanalysis and Freudianism to the Paris stage, where Pitoëff was his most understanding interpreter. His plays include *Les Possédés* (1909); *Pous-sière* (1914); *Les Ratés*; *Le Temps est un songe*; *Le Simoun* (1921); *Le mangeur de rêves* (1922); *La Dent rouge* (1923); *Une Vie secrète*; *À l'ombre du mal* (1924); *L'Homme et ses fantômes* (1925); *L'Armée secrète, suivi de Fidélité et du Juge intérieur* (1925); *Le Lâche* (1926); *Miaure* (1927). Consult *Sur le Théâtre de H.-R. Lenormand*, by Daniel Rops (1926).

**LENTELLI, LEO (1879- )**. An American sculptor born in Bologna, Italy, who was formerly instructor of drawing at the Art Students' League, New York and of sculpture at the California School of Fine Arts. He is best known for his figure of the Savior and 16 figures for the reredos of the Cathedral of St. John the Divine, New York. He also designed groups for the Panama-Pacific International Exposition in San Francisco in 1915. Among his awards was the gold medal for sculpture offered by the New York Architectural League in 1922. He became a member of the National Society of Sculptors in 1907.

**LEONARD, ADNA WRIGHT (1874- )**. A Methodist Episcopal bishop, born at Cincinnati, Ohio. He was graduated from New York University in 1899 and from the Drew Theological Seminary in 1901. In 1889 he was ordained to

the Methodist Episcopal ministry and held pastorates in Porto Rico, Rome, and several cities in Ohio. From 1910 to 1916, he was pastor in Seattle, Wash. In the latter year, he was elected bishop. He is the author of *The Shepherd King* (1911); *Evangelism in the Remaking of the World* (1919); and *Hearthstone League: a Book of Remembrance* (1925).

**LEONARD, WILLIAM ELLERY** (1876- ). An American teacher of English, born at Plainfield, N. J. He was graduated from Boston University in 1898 and took post-graduate courses at Harvard, at Boston University, and in Germany. He served as instructor and principal in several high schools in New York and in Massachusetts, and in 1906 was appointed instructor of English at the University of Wisconsin. He was successively assistant and associate professor of English in that university. Since 1926 he has been full professor. He was a member of many learned societies and is the author of *Sonnets and Poems* (1906); *The Poet of Galilee* (1909); *The Lynching Bee and Other Poems* (1920); *The Locomotive God* (autobiography, 1927); *A Son of Earth* (1928). He also translated many important plays and works from foreign languages.

**LEONCAVALLO, Iŕ'ŕn-kā-vāl'lŕ,** RUGGIERO (1858-1919). An Italian dramatic composer (see Vol. XIII). He added to the list of his operas: *La Candidata* (Rome, 1915); *Goffredo Mameli* (Genoa, 1916); *Prestami tua moglie* (Montecatini, 1916); *A chi la Giarrettiera?* (Rome, 1919); and the posthumous *Edipo Rē* (Chicago, 1920), and *Il primo Bacio* (Montecatini, 1923). An opera, *Tormenta*, remained unfinished. From posthumous material, Salvatore Allegra arranged an operetta, *La Maschera nuda* (Naples, 1925). He was one of the few composers who became famous through a single work. This was his earliest, *Paqliacci*, which is the only one that has maintained itself in the standard repertory.

**LEONI, Iŕ-ŕ'nē, FRANCO** (1804- ). An Italian composer, born at Milan. He studied at the Milan Conservatory under Dominicetti and Ponchielli. In 1892 he moved to London. He owes his reputation mainly to his very successful opera *L'Oracolo* (London, 1905; New York, 1915). His other operas are *Raggio di Luna* (Milan, 1888); *Rip Van Winkle* (London, 1897); *Ib and Little Christina* (London, 1901); *Franческа da Rimini* (Paris, 1914); *Massemarello*, *Le Baruffe chiozzotte*, *Falene* and *La Terra del Sogno* (all in Milan, 1920). He also wrote the cantatas *Sardanapalus*, *The Gate of Life*, and *Golgotha*, and composed many songs.

**LEPROSY.** With the advance of knowledge and experience, this affection is slowly passing from a hopeless to a relatively curable one. A system of parole prevails among the cured lepers in some localities, and the number that return for treatment gives an inkling as to the success of the latter; thus, of the paroled lepers in the Hawaiian Islands under charge of the United States government, only 8 per cent return for further treatment.

The most impressive news under this head for some years past is the project to raise a fund of \$2,000,000 to combat leprosy in the Philippines, where all lepers have been segregated in the Island of Culion to the number of 6000. This colony serves both to prevent and cure, and at the same time furnishes the greatest opportunity for scientific study of the disease. The fact

that more than 1000 of the colony have been discharged with the disease brought to arrest is a testimonial of the wisdom of segregation. The Philippines Health Department is unable to appropriate the large amount of money necessary for the upkeep of this colony, so that the matter has been taken over by private benevolence, the movement being known as the Leonard Wood Memorial for the Eradication of Leprosy, the late General Wood having taken great interest in the colony during and after his administration of the Philippines.

Although the Wood Memorial has no illusions concerning the leper population of the world, which is placed as at least 3,000,000, it has recently been shown that nearly all countries understate their leper population. Thus, India is supposed in some quarters to have only 100,000 lepers in place of the million which should be credited to her and the same shrinkage is found in numerous other countries. Whatever may be said of good results in small select material, it is staggering to think of curing millions of lepers.

**LE ROY, Ie-rwŕ, EDOUARD** (1870- ). A French philosopher, born at Paris. He was admitted to the *École Normale Supérieure* in 1892, and devoted himself first to mathematics and then to philosophy, receiving his doctorate in the mathematical sciences in 1898. After serving as professor of mathematics in various lycées, he was called to take Bergson's place in the Collège de France in 1914. In 1919 he was elected to the Academy of Moral and Political Sciences, and in 1921 was appointed to the chair of philosophy at the Collège de France. In 1923 he was visiting professor at Columbia University, New York. In his general philosophy, Le Roy, like Bergson, opposed the stereotyped formal intellectualism, which was fashionable at the end of the nineteenth century. He held that there was no essential distinction between scientific rationalism and the religious aspiration for salvation and perfection.

In addition to studies published in the *Revue de Métaphysique* and in the *Annales de Philosophie Chrétienne*, Le Roy published in 1911 an exposition of the Bergsonian method in philosophy, *Une Philosophie Nouvelle: Henri Bergson* (translated into English in 1913).

**LEUSCHNER, ARMIN OTTO** (1868- ). An American astronomer, born at Detroit, Mich. He was graduated at the gymnasium at Cassel, Germany, and in 1888 from the University of Michigan, receiving his Ph.D. degree from the University of Berlin (1907). He was an instructor of mathematics at the University of California, where in 1907 he became professor of astronomy and in 1913-18 and 1920-23 dean of the graduate school. During the World War, he was connected with the Chemical Warfare Service with the rank of major and was also associated with the division of physical sciences of the National Research Council. Dr. Leuschner gave much attention to the perturbations of the Watson asteroids and for his studies on this subject he received in 1915 the Watson Medal of the National Academy of Sciences. He also made valuable improvements in the methods of determining preliminary orbits of comets and planets, and published various papers on theoretical astronomy. He wrote *Celestial Mechanics* (1922).

**LEVERETT, FRANK** (1850- ). An American geologist, who was born at Denmark, Iowa, and passed the first 20 years of his life on a

farm. He taught one year in the public schools and four years (natural sciences) in Denmark Academy. He was graduated from Iowa Agricultural College in 1885, and in the following year entered the U. S. Geological Survey, becoming assistant geologist (1890-1900), and geologist in 1901. He has specialized in glacial geology and in water resources. He was elected to the National Academy of Sciences in 1929. His contributions include: *Water Resources of Illinois* (1896); *Water Resources of Indiana and Ohio* (1897); *The Illinois Glacial Lobe* (1899); *Glacial Deposits of the Erie and Ohio Basins* (1901); *Flowing Wells and Municipal Water Supplies of the Southern Peninsula of Michigan* (1906); *Comparison of North American and European Glacial Formations* (1910); *Surface Geology of Michigan* (1911, 1912); *The Pleistocene of Indiana and Michigan and the History of the Great Lakes* (1915); and *Surface Formations and Agricultural Conditions of Minnesota* (1915, 1916, 1918).

**LEVERMORE, CHARLES HERBERT** (1856-1927). An American educator and peace advocate, born at Mansfield, Conn. He was graduated from Yale in 1879, and after serving as teacher in history in several schools, he became professor of history at the Massachusetts Institute of Technology in 1888, serving until 1893. From 1896 to 1912, he was president of Adelphi College, Brooklyn, and from 1913 to 1917, director of the College and University Bureau of the World Peace Foundation. He was a member and official in many other peace organizations and lectured much on subjects relating to peace. In 1924 he was awarded the Bok Peace Prize of \$100,000 for the best plan for insuring peace among the nations. He was the author of *The Republic of New Haven* (1886); *Forerunners and Competition of the Pilgrim and Puritan* (1912); series *Year Books of the League of Nations* (1919-22); *Life of Samuel T. Dutton* (1922); and the compiler of several students' song books.

**LÉVI, lā'vè, SILVAIN** (1863- ). A French Orientalist (see VOL. XIV). In 1921 he lectured at Tagore's University in Santiniketan, Bengal, India. He was a contributor to periodicals devoted to Orientalism and the author of a number of books, among them: *Literary History of Sanskrit Buddhism*, with Winternitz and Huber (1920); a translation and introduction to *La Légende de Nala et Damayanti* (1920); a preface and vocabulary for E. Chavannes' *Contes et Légendes du Bouddhisme Chinois* (1921); *Dans l'Inde* (1925), and *L'Inde et le Monde* (1926).

**LEVINSON, SALMON OLIVER** (1865- ). An American lawyer and peace advocate, who was born at Noblesville, Ind., and graduated at Yale (1888). He studied law at Lake Forest University and was admitted to the Illinois bar in 1891. He has since practiced at Chicago, specializing in the reorganization of railroads and industrials. Mr. Levinson is chairman of the American Committee for Outlawing War. He is the author of the Levinson Plan for readjustment of German reparations, allied and inter-allied debts, European appeasement, and world peace, issued in 1927.

**LEVINTHAL, BERNARD LOUIS** (1866- ). An American rabbi, born at Vilna, Russia. He was educated in the schools of Russia and came to the United States in 1891. Since that year, he has been minister of the United Orthodox

Hebrew Congregation of Philadelphia, and was the founder and president of the Orthodox Rabbinical Association of America. He was a member of the delegation of the American Jewish Congress to the Peace Conference in Paris in 1919 and a member of the faculty of the Rabbinical College of America in New York.

**LEVITZKI, MISCHA** (1898- ). A Russian pianist, born at Kremenchug. Having begun his musical studies under A. Michailovskii in Warsaw, he continued under S. Stojovski at the Institute of Musical Art in New York (1907-11). For the next four years, he studied, at irregular intervals, with E. Dohnányi at the Königliche Hochschule in Berlin, winning the coveted Mendelssohn Prize. Although he had played in public as an infant prodigy, his career as a full-fledged pianist dates from his début at Antwerp (1912). He then made tours of Belgium, Germany, Austria, Hungary, and Scandinavia. His American début took place in New York (Oct. 17, 1916). In 1921 he made a tour of Australia and in 1925, of the Orient. He is recognized as one of the masters of the keyboard.

**LÉVY-BRUHL, LUCIEN** (1857- ). One of the leading French philosophers of the sociological school. He was born in Paris, was educated at the École Normale Supérieure, in 1899 was called to the faculty of the Sorbonne, and in 1918 was elected to the Institute (Académie des Sciences Morales et Politiques). Originally attracted in the direction of idealistic metaphysics, Professor Lévy-Bruhl transferred to the sociological and objective study of the moral sciences. The publication of his book, *La Morale et la Science des Mœurs* (1903) created a philosophic furor, owing to the boldness with which he attacked all attempts to rest ethics on metaphysics. He pleaded for the recognition of the relativity of moral laws and customs to the structure of societies. In pursuit of the sociological programme, Dr. Lévy-Bruhl undertook an interpretation of the mental life of primitive peoples, and published three important works on that subject: *Les Fonctions Mentales dans les Sociétés Inférieures* (1910); *La Mentalité Primitive* (1922, Eng. trans., 1923); and *L'Âme primitive* (1927, Eng. trans., 1928). His other works are *L'idée de responsabilité* (1884); *L'Allemagne depuis Leibniz* (1890); *La Philosophie de Jacobi* (1894); *Lettres Inédites de John Stuart Mill à Auguste Comte* (1899); *History of Modern Philosophy in France* (1899); *La Philosophie d'Auguste Comte* (1900); and *Jean Jaurès; esquisses biographiques* (1924).

**LEWIS, GILBERT NEWTON** (1875- ). An American chemist, born at Weymouth, Mass. He was graduated from Harvard University and studied at Leipzig and Göttingen. He taught chemistry at Phillips Academy and was instructor at Harvard during 1899-1900 and 1901-06, being on leave during 1904-05 to take charge of weights and measures at the government laboratories in the Philippines. In 1907 he became connected with the physical chemistry research work of the Massachusetts Institute of Technology, where in 1911 he was made professor. In 1912 he became professor of physical chemistry and dean of the School of Chemistry at the University of California. During the World War, Professor Lewis was chief of the defense division of the Gas Service with the rank of lieutenant colonel, and chief of the training division of the Chemical Warfare Service. He

published papers resulting from his studies on the thermodynamic theory and its application to chemistry, electric potentials of the common elements, specific heat of electrons, the structure of the atom and the molecule, and the theory of valence. The French government conferred on him the Legion of Honor. He is the author of *Thermodynamics and the Free Energy of Chemical Substances* (with M. Randall, 1923); *Valence and the Structure of Atoms and Molecules* (1923); *The Anatomy of Science* (1926).

**LEWIS, ISAAC NEWTON** (1858- ). An American soldier and inventor born at New Salem, Pa. He was graduated from the United States Military Academy in 1884 and was commissioned second lieutenant in the 2d Artillery. By successive promotions, he rose to the rank of colonel in 1913, and was retired in that year for disability incurred in line of duty. He early made himself an authority on ordnance and was sent to Europe in 1900 to study that subject, his report resulting in the re-armament of the field artillery. The machine gun bearing his name was invented by him and after its rejection by the United States was accepted by the British government. During the World War, it was used by the Allied Armies, by the United States Navy and the airplanes of the United States and the Allies. The royalties, amounting to at least \$1,000,000 on guns made for the United States after it entered the War, were declined by him. His other inventions have included a time-interval clock and bell system of signals, a replottting and relocating system for coast batteries, an automatic sight, quick-reading mechanical verniers for use in coast defenses, electric car lighting, and windmill electric lighting systems.

**LEWIS, JAMES HAMILTON** (1866- ). An American legislator (see VOL. XIV). He served as United States Senator from Illinois from 1913 to 1919, as a Democrat. He was candidate for Governor of Illinois in 1920 but was defeated. In 1914 he served as United States Commissioner at London to execute treaty laws for safety at sea. He wrote *The Two Great Republics: Rome and the United States* (1913) and *History of International Law*. In 1918 he was engaged in special work in France.

**LEWIS, PAUL A.** (1879-1929). An American research pathologist who was associated with the Rockefeller Institute for Medical Research. Born in Chicago, he received his preliminary education at the University of Wisconsin and graduated in Medicine at the University of Pennsylvania in 1904. He was an associate in pathology at the Rockefeller Institute (1908-10), director of the laboratory of the Phipps Institute, University of Pennsylvania (1910-23), and professor of pathology at the university (1921-23). He was summoned to New York City in 1916 as one of a commission to fight infantile paralysis and from 1917 to 1921 was a commander of the U. S. Naval Reserve. In 1923 he returned to the Rockefeller Institute's animal pathology division at Princeton and in 1925 became allied with the research committee of the National Tuberculosis Association. Upon the outbreak of yellow fever in Brazil in 1928, he was sent by the Rockefeller Institute to Bahia, Brazil, to study the disease, which he contracted. He died June 30, 1929.

**LEWIS, SINCLAIR** (1885- ). An American author born at Sauk Center, Minn. He received his bachelor's degree from Yale Univer-

sity in 1907 and worked on newspapers in New Haven, San Francisco, and other cities. He was successively assistant editor of the *Transatlantic Tales*, *Volta Review*, *Adventure*, Publishers' Newspaper Syndicate, and editor with the Geo. H. Doran Company to 1916. He became universally known in 1920 through his novel *Main Street*, which for the first time in the history of the novel in the United States treated with utter seriousness and perspicuity life in a small town in the Middle West. This was the manifesto for a new school of Western writers which had been growing since shortly before the World War, and the Middle West assumed a dignified and assured place in the literature of this country. His *Babbitt* (1922) treats of the development of a man's bourgeois soul in the Middle West, his one attempt at revolt, and his subsequent return to the respectable fold. Other novels are *Our Mr. Wren* (1914); *The Trail of the Hawk* (1915); *The Job* (1917); *The Innocents* (1917); *Free Air* (1919); *Dr. Arrow-smith* (1924); *Mantrap* (1926); *Elmer Gantry* (1927); *Dodsworth* (1929). He wrote a play, *Hobohemia*, produced in New York City in 1919, and he has contributed short stories to magazines.

**LEWIS, SIR THOMAS** (1881- ). A British physician specializing in heart diseases. Born in Cardiff, Wales, he was educated in the local university, and received the degree of M.B. in 1905 from the University of London. He subsequently lectured on cardiac pathology there and when the periodical *Heart* was established, became its editor. He was knighted in 1921. Lewis has written much on the heart, his major publications comprising *The Mechanism of the Heart Beat* (1911); *Clinical Disorders of the Heart Beat* (1912); *Clinical Electrocardiography* (1913); *Lectures on the Heart* (1915); *The Soldier's Heart and the Effort Syndrome* (1919); *The Mechanism and Graphic Representation of the Heart Beat* (1921).

**LEWIS, WARREN KENDALL** (1882- ). An American chemist, born at Laurel, Del. He was graduated in 1905 from the Massachusetts Institute of Technology, and in 1908 received his Ph.D. degree at Breslau. In 1908 he became a research associate in the laboratory of applied chemistry at the Massachusetts Institute of Technology, where in 1915 he became professor of chemical engineering. During the World War, he was an assistant in charge of defensive problems of the research division of the Chemical Warfare Service. Dr. Lewis contributed articles on chemical technology to Thorp's *Outlines of Industrial Chemistry* and also to various scientific journals.

**LEWIS, WILLIAM MATHER** (1878- ). An American college president, who was born at Howell, Mich., and graduated at Lake Forest (Ill.) College (1900). He was instructor in Illinois College (1900-03) and in Lake Forest College (1903-06). For seven years, he was head master of Lake Forest Academy and was president of the Lake Forest Board of Education (1911-13). He later served as mayor (1915-17) and as member of the Board of Review. During the World War, he was executive secretary of the National Committee of Patriotic Societies. In 1919-21 he was director of the Savings Division of the U. S. Treasury Department. He acted as chief of the education service maintained by the Chamber of Commerce, U. S. A., in 1921-23, was president of George

Washington University (1923-27), and since 1927 has been president of Lafayette College, Easton, Pa. He edited *Selected Readings from the Most Popular Novels* (1904); *The Voices of Our Leaders* (1917); and *Liberity Loan Speakers' Hand Books* (1918).

**LEWISOHN, LUDWIG** (1882- ). A German-American author, born in Berlin. He was taken to the United States in 1890, and received his education in the public schools and at Columbia University. He taught German in the University of Wisconsin (1910-11) and at Ohio State University (1911-19). During his teaching years, he devoted much time to writing and in 1919 was dramatic editor for the *Nation*, becoming associate editor of that magazine in 1920. He made several translations from the German, chief among which are the dramatic works of Gehart Hauptmann (1912-17). His best-known book is *Upstream* (1922), an autobiography in which is set forth a searching criticism of the intellectual and artistic life of this country. His novel, *Don Juan*, which appeared in 1923, deals with the problem of divorce. Other of his works are *An Introduction to the Study of German* (1910); *The Modern Drama* (1915); *The Spirit of Modern German Literature* (1919); *Poets of Modern France* (1918); *The Drama and the Stage* (1922); *The Creative Life* (1924); *Israel* (1925); *Cities and Men* (1927); *Roman Summer* (1927); *The Island Within* (1928).

**LEXER, ERICH** (1867- ). A German surgeon, known especially for his efforts in transplanting joint surfaces and other plastic work of the same kind. Born in Würzburg, he received his medical degree from the university of that city in 1890 and was made professor of surgery at the University of Jena in 1910, at Freiburg in 1920, and at Munich in 1927. His first work on surgery was his *Lehrbuch der Allgemeinen Chirurgie* (2 vols., 1904-05, 17th ed., 1928). At a later period, with Garré and Küttner, he brought out the *Handbuch der Praktischen Chirurgie*, which was reissued in six volumes, 1921-23. He also summed up his World War and post-war experiences in his *Wiederherstellungschirurgie* (1920).

**LEYEN, FRIEDRICH VON DER** (1873- ). A German writer, professor of Old German philology at the University of Cologne since 1920. He was born at Bremen and studied at Marburg, Leipzig, and Berlin. Included among the many works he published are *Indische Märchen* (1898); *Das Märchen in der Göttersage der Edda* (1899); *Götter und Göttersagen der Germanen* (1909); *Das Märchen* (1911); *Die Deutschen Heldensagen* (1912); *Das Studium der Deutschen Philologie* (1913); *Das Deutsche Märchen* (1917); *Die Deutsche Dichtung* (1918); *Deutsche Dichtung in Neuer Zeit* (1922, 2d ed., 1927); *Geschichte der Deutschen Dichtung* (1926). He also edited works of Herber, Schlegel, Wackenroder, Hertz, and others.

**LIBERIA.** A Negro republic on the west coast of Africa. The area is estimated at 43,000 square miles. The population is estimated at 2,500,000, of which American Liberians numbered 20,000; the capital, Monrovia, has 10,000. In 1927 the enrollment in all the Liberian schools was placed at only 3000. Agricultural methods are still primitive and the country's economic resources, e.g., minerals, ivory, hardwoods, have hardly been tapped. Leading products include cocoa, cotton, coffee,

piassaba fibre, and palm oil and kernels. Imports are rice, gin, tobacco, cotton piece goods, building materials. Trade is mainly with the United Kingdom, Liberian exports in 1913, 1920, and 1925 being £56,709, £537,362, and £382,211, and imports for the same years, £90,258, £271,992, and £423,004. Trade with the United States in 1916 was \$263,717. In 1912-13 revenues were \$618,800 and expenditures \$529,548. In 1917-18 these had dropped to \$273,000 and \$255,700. For 1925-26 revenues totaled \$962,570 and expenditures \$939,978. In 1918 customs duties brought in \$162,120; in 1920, \$314,690; in 1926, \$518,504. The customs office is administered by an official appointed by the United States. The police force, maintained for the security of the revenue, cost \$120,000 in 1925. The only means of inland communication is a motor road 24 miles long. There are no railways or telegraphs. There are two wireless stations at Monrovia and cable lines from there to Europe and New York.

The entry of the United States into the World War paved the way for Liberian participation. In August, 1917, Liberia declared war on Germany and seized the opportunity to eject the Germans, who up to that time had controlled more than 75 per cent of Liberia's trade. In 1918 a German submarine, in retaliation for the seizure of German property, shelled Monrovia and sank the single vessel which constituted the country's navy. Beginning with 1920, the United States began to occupy the leading rôle in Liberia's affairs. The direct occasion for this move was the fact that, in 1918, the United States had placed to the credit of Liberia for war expenditures the sum of \$5,000,000. Only \$26,000 was used before the War terminated, with the result that a proposal was made that the whole be carried as a government loan to Liberia. The Senate of the United States failed to approve the loan, however, and Liberian finances are in a precarious position. The President for 1916-20 was Daniel E. Howard; for 1920-24, 1924-28, and 1928-32, C. D. B. King.

**LIBERTY BONDS.** See FINANCE AND BANKING.

**LIBERTY TUNNEL, PITTSBURGH.** See TUNNELS; PITTSBURGH.

**LIBRARY ASSOCIATION, AMERICAN.** The growth of the Association since 1914 has gone hand in hand with the growth of American libraries during that time. During the World War, the Association organized and administered library service for the Army, Navy, and Marine Corps at the request of the United States government. Five million dollars and several million books and magazines were collected. Fully equipped libraries were maintained in the principal camps and stations, collections of books and magazines were sent to small camps and posts, and service was rendered to the overseas troops. Hospital library service was an important feature in 1920-30. At the end of the War, the War and Navy Departments took over the service, and later, the Veterans' Bureau took over the library service for men in hospitals.

For 1919-30, the Association prepared a great extension programme, but the financial campaign was not fully organized and resulted in donations of less than \$100,000 for the new work. Some increase in the Association's extension service was made possible, however, and the publicity for the campaign greatly stimulated interest in the development of libraries.



Recognizing the need for trained librarians and standards for library training, the Council of the Association in 1924 created a permanent Board of Education for Librarianship. Since that time, the board has made a survey of library schools; stimulated an interest in library training; endeavored to bring into the profession young people especially suited for it; and has acted as a clearing house for information about the library schools in operation throughout the country.

In 1923 the American Committee for Work in Devastated France founded the Paris Library School, conducted under the auspices of the American Library Association, to train librarians to carry on the libraries established by the committee after the War. The committee provided funds to carry on the school for two years, and at the end of the second year, a gift of \$37,500 was received from John D. Rockefeller for the year 1926-27. Since that time, it has been supported by internationally minded friends. It is hoped that an American university will take over the responsibility for the School in the fall of 1929, otherwise it will be forced to go out of existence.

The Committee on Library Extension reported the findings of a survey in *Library Extension*. (See LIBRARY PROGRESS.) The publication brought to the attention of the members of the Association the need for libraries among rural people. The goal of the committee is to provide adequate library service within easy reach of every one in the United States and Canada. There were 50,000,000 people without such service, most of whom are in the rural districts. The survey indicated that the county library system is the most efficacious and economical way known at present to get books to rural people, and the committee is bending its efforts to bring about the establishment of county libraries throughout the country.

A Commission on the Library and Adult Education was appointed in 1924 to study the relation of libraries to adult education. The study resulted in the publication of a report, *Libraries and Adult Education*. On the completion of the report, a Board on the Library and Adult Education was established and has since that time been engaged in gathering material and serving as an information centre. The board publishes a quarterly, *Adult Education and the Library*. An adult-education venture in which the board has been particularly interested is the "Reading with a Purpose" series. This is a series of reading courses, published by the Association, on different subjects, each one written by an authority. The courses are distributed chiefly through libraries. The first courses were mainly of a cultural nature, typical examples being *French Literature*, by Irving Babbitt, and *Psychology*, by Everett Dean Martin. Recently, practical courses on such subjects as *Salesmanship* and *Advertising* have been added. Over half a million of the courses have been sold. There were in 1929 41 titles in the series.

In addition to issuing the reading courses, the Association publishes books and pamphlets on library work, buying-lists for libraries, etc. Over one million copies of American Library Association publications were distributed during 1928. Most of them were sold. Typical publications are *Public Library Administration*, by John Adams Lowe, the *Manuals of Library Economy*, *A Survey of Libraries in the United States*, and *The Hospital Library*, edited by Edith Kathleen Jones. The *Booklist*, a guide to new books,

is issued monthly, except in July and August.

A large part of the work of the Association is done by its 64 voluntary committees. Some of the activities of the committees during the past few years have been the publication of the *Children's Library Year-Book*, by the Committee on Library Work with children; the "brailling" of a number of books through the efforts of the Committee on Work with the Blind; the publication of the report, *Reading Interests and Habits of Adults*, in coöperation with the American Association for Adult Education, through the Committee on the Study of the Development of Reading Habits; and the compilation of the *Union List of Serials* through the coöperation of the Committee on the Union List of Serials.

Beginning in 1922, the Children's Librarians' Section of the Association has awarded the Newbery Medal annually for the most distinguished children's book published in America during the year. The medal is the gift of Frederick Melcher. It has been won by the following authors: Hendrik Willem Van Loon, for *The Story of Man-kind*; Hugh Lofting, for *The Voyages of Dr. Dolittle*; Charles Boardmann Hawes, for *The Dark Frigate*; Charles J. Finger, for *Tales from Silver Lands*; Arthur Bowie Chrisman, for *Shen of the Sea*; Will James, for *Smoky*; Dhan Gopal Mukerji, for *Gay Neck*; and Eric P. Kelly, for *The Trumpeter of Kratow*.

The membership of the Association has increased from 2905 in 1914 to over 11,000 in 1929. Annual conferences have been held in different parts of the country. In 1926 the fiftieth anniversary conference was held in Atlantic City. Librarians from many foreign countries attended this conference as the guests of the Carnegie Endowment for International Peace and of the Association. The Association derives its revenues from membership dues, *Booklist* subscriptions, sales of publications, endowment funds, and grants for special projects.

**LIBRARY PROGRESS.** The development of school libraries throughout the United States has been the outstanding feature in the library world since 1914. Although the movement for libraries in schools had been under way before 1917, the matter was given new impetus at that time by the adoption by the National Education Association and the American Library Association of the report of a joint committee on library organization on "Standard library organization and equipment for secondary schools of different sizes." Many accredited library schools have established courses for the training of school librarians, and standards for such courses have been fixed. A number of research studies have been under way—notable among them the study of the North Central Association of Colleges and Secondary Schools and Lucile Fargo's *The Library in the School*, one of a series of textbooks prepared by the American Library Association curriculum study. Excellent buying-lists of literature suitable for use in school libraries also have been published. Close coöperation has been maintained between the national educational and library associations and has resulted in raising the standards of school libraries and in establishing libraries, not only in high schools but in elementary and junior high schools. School boards and public-library boards are becoming convinced of the need for school libraries and appropriations for them are increasing year after year. Several States have appointed State school-library supervisors.

The success of library service for soldiers during the World War turned the minds of librarians to the possibilities of the library as a factor in adult education. The Chicago Public Library in 1923 created a Readers' Service Bureau, the particular function of which was to increase the usefulness of the library to men and women who wished to continue their education after their formal training was over. Since 1923, 27 libraries in 18 States have established readers' bureaus similar to the one in Chicago. Round-table discussions for readers' advisers were held as a part of the American Library Association conferences in 1927 and 1928, and in 1929 a two-day institute was held. A Commission on the Library and Adult Education was appointed in 1924 by the American Library Association to study the relation of adult education to libraries. The study resulted in the publication of a report, *Libraries and Adult Education*, in 1926. The report was included in a series of Studies in Adult Education, sponsored by the Carnegie Corporation. In this same series, two other volumes of value to the library world appeared, *The Reading Interests and Habits of Adults*, by Dean W. S. Gray and Ruth Muroe, and *Adult Learning*, by E. L. Thorndike.

Since 1926 the work of the American Library Association Commission on the Library and Adult Education has been carried on by the Board on the Library and Adult Education. One of the important projects of the Commission, and later of the Board, has been the publication of the "Reading with a Purpose" series of reading courses. Forty-seven of these courses have been issued. Each course is prepared by a specialist and contains a short essay, followed by four or five books recommended by the author, in the event the reader wishes to pursue the study of the subject further. A study by Emma Felsenthal which resulted in the publication of *Readable Books in Many Subjects* in 1929 is proving valuable to libraries with and without readers' advisory service.

Several important conferences, which called forth an international exchange of ideas, have been held since 1914. In 1926 the American Library Association held its Fiftieth Anniversary Conference which was attended by delegates from many foreign countries, through the generosity of the Carnegie Endowment for International Peace. In 1927 the British Library Association celebrated its fiftieth anniversary with the Jubilee Conference which was attended by a number of delegates from the United States. At this conference, the International Library and Bibliographical Committee was formed. Several Americans were on the Committee. In 1929 this Committee called the first world's Library and Bibliographical Congress in Rome and Venice. Sixty-seven librarians from the United States attended the congress and a number of them contributed to the programme. In response to an invitation tendered personally by delegates of the American Library Association to the Mexican Library Association, six delegates appointed by the Minister of Education of Mexico were present at the Fiftieth Annual Conference of the American Library Association as guests of the Carnegie Endowment for International Peace and the American Library Association. The meeting was made the occasion for a discussion of Mexican Library affairs and resulted in an interchange of bibliographical information between the United States and Mexico.

A number of American librarians have been called upon to help solve the library problems of other countries. W. W. Bishop, librarian of the University of Michigan Library, J. C. M. Hanson, of the University of Chicago Libraries, and Charles Martel, chief of the Cataloging Division of the Library of Congress, at the request of Vatican authorities and by means of a grant from the Carnegie Endowment for International Peace, spent several months in the Vatican Library making suggestions for the revision and enlargement of the catalogue and conferring with Vatican authorities about the collection of printed books and incunabula. Milton Ferguson, of the California State Library, and S. A. Pitt, of the Glasgow, Scotland, Library made a survey of library conditions in South Africa for the Carnegie Corporation.

The number of students attending library schools has been steadily increasing until in 1928-29 there were over 1000 students enrolled in the schools. There are now fifteen schools accredited by the Board of Education for Librarianship of the American Library Association which are offering courses for graduate and undergraduate study. In addition to these schools, there are at least six or eight other schools, some of them only recently opened, which are offering a full year's curriculum in library science for school-library work. Every summer, many of the accredited schools and a number of universities are offering summer courses in library science. The first school to be devoted exclusively to graduate work in library science was established at the University of Chicago in the fall of 1928.

Probably the most notable bibliography ever sponsored by American librarians, the *Union List of Serials*, was published in 1927. It includes entries for over 75,000 titles of serials and locates holdings in over 225 American libraries. The volume involved nearly six years of labor.

Over 60,000,000 people in the United States, that is, 57 per cent of the population, have public-library service, according to the report on library extension published in 1926 by the American Library Association Committee on Library Extension. Whereas only 7 per cent of the urban population is unserved, this report disclosed that 82 per cent of the rural population is without adequate library service. A nation-wide effort is being made to provide books for rural people through tax-supported county libraries. Most States have laws permitting the establishment of such libraries and State-library-extension agencies which foster their growth. There were in 1929 206 county libraries in 33 States and the number is increasing rapidly.

The field of special library work has developed to an extraordinary degree since 1914. The library has become an important factor in many business concerns. Membership in the Special Libraries Association numbers over 1000. Financial, insurance, museum, newspaper, commercial, and technical librarians, together with librarians of public libraries, make up the membership of the Association.

Other important developments of the past few years are an increase in library service to the blind, both to adults and children; a tendency to cooperate with moving-picture and other industries to promote education through visual aids; an experiment being carried on in Massachusetts where a young man librarian is living among prisoners working with prison officials in an attempt to solve prison-library problems of long

standing; greater emphasis on library publicity; more attention to work with the foreign-born.

There were in 1929 over 12,000 library buildings in the United States. Among the large libraries built since 1914 are the Widener Library, Harvard University; University of California Library; University of Minnesota Library; and the Sterling Memorial Library at Yale University; the Public Libraries at Detroit, Mich.; Wilmington, Del.; Cleveland, Ohio; Los Angeles, Calif.; Philadelphia, Pa. and Queens Borough, N. Y.; and the California State Library, at Sacramento. A number of gifts have been made for erecting library buildings and for building up special collections of books. The Carnegie Corporation discontinued the giving of money for library buildings "in the belief that so many of these have been provided, and so many communities have received the impulse for library facilities, that the purpose which Mr. Carnegie had in view has been in large measure accomplished."

**LIBYA.** An Italian colony on the north coast of Africa, between Tunis and Egypt. It consists of the two provinces of Tripolitania and Cyrenaica. Its area is estimated at 406,000 square miles; its native population (census of Dec. 1, 1921) was 569,093. The total estimated population was put at 1,000,000 divided racially into 30 per cent Arabs, 40 per cent Negroes, 23 per cent Jews, 7 per cent Europeans. The civil European population in 1921 numbered 28,304, made up mostly of Italians and Maltese. Tripoli, the capital of Tripolitania, had 73,000 inhabitants; Benghazi, capital of Cyrenaica, 35,000. The country is largely desert, but in the coastal region and in the highlands, agricultural and pastoral activities are carried on. Barley is chiefly grown, but henna and dates also are cultivated. Other articles of trade consist of sponges, tunny fish, ostrich feathers, potatoes, matting, fats, honey, and hides of camels, oxen, sheep, and goats. For want of irrigation, agriculture is necessarily restricted. The caravan trade into the Sudan, formerly very important, is being diminished because of the French occupation of Timbuktu and the presence of the Kano-Lagos Railway in British Nigeria. Principal exports into Sudan are cotton and woolen goods, blankets, rugs, tea, coffee, sugar, and paper. Imports from the Sudan are ivory, ostrich feathers, hides, skins and leather objects. Imports by sea into the colony include wines and liquors, oils, sweetmeats, chemical products, cotton, woolen, and silk yarns, iron and steel manufactures, tobacco, and matches. Total exports in 1927 for Tripolitania were 24,259,201 lire; imports, 240,056,377 lire; revenue and expenditure for 1928-29, 233,719,250 lire. The exports of Cyrenaica in 1927 were 14,908,800 lire; imports 178,238,195 lire; revenue and expenditures for 1928-29, 205,496,250 lire. The Italian government maintains 19,680 men in Tripolitania and 18,600 men in Cyrenaica for defense purposes. There are in all 189 miles of railway in operation to supplement the principal means of communication, i.e., caravan routes. By the Treaty of Lausanne (Oct. 18, 1912), the Turkish evacuation of Libya paved the way for Italian occupation. The pacification of Tripolitania proceeded without difficulty, so that by 1915 the coastal region was well under Italian control. In Cyrenaica, however, great difficulties were encountered. The Senussi continued in possession of the interior and stubbornly contested the scheme of Italianization. Fighting

went on during 1914 and 1915 and so successful were the insurgents that the inland garrisons had all to be abandoned and Italy was once more reduced to her coastal possessions. In 1916, with Turkish aid, the Senussi brought the fighting into the coastal region, and but for the failure to unite all the insurgent forces, might have succeeded in expelling the Italians entirely. The end of the War found the local chieftains unable to effect a common understanding among themselves. To gain over the local tribes, the Italians, after the War, deemed it necessary to grant autonomy. A parliament was set up, and as a result of peace being established with the Senussi in November, 1920, the Italians were able to resume once more their penetration with only occasional molestation. By arrangement with France in 1919, the western frontier of Tripoli was laid out to extend in a curve from west of Ghadames to south of Tummoo. Similarly, as a result of an understanding with Great Britain, Jarabab, on the Egyptian frontier, was ceded to Italy. In 1928 the territory in effective occupation was extended to the southward and a number of important oases were occupied.

**LICHNOWSKY, KARL MAX, PRINCE** (1860-1928). A German diplomat. He served in important capacities in several embassies, and at the outbreak of the World War was German Ambassador in London. He endeavored, by every means in his power, to prevent the outbreak of War, and afterward went into retirement. Here he wrote an account of his "mission to London," which was privately circulated. Extracts appeared in a Swedish newspaper, in March, 1918, and shortly afterward were published in book form under the title *Heading Towards the Abyss*. In this, he brought serious charges against the German government for its pre-war policies. The book made a great sensation and General Erich Ludendorff urged that proceedings be taken against Lichnowsky, but nothing was done.

**LIE, JONAS** (1880- ). An American landscape and figure painter (see Vol. XIV). He won the silver medal of the San Francisco Exposition in 1915, the Greenough Memorial Prize at Newport, R. I., in 1916, and the gold medal, Art Week, at Philadelphia in 1925. Mr. Lie became a member of the National Academy in 1925. He is secretary of the New Society of Artists (New York).

**LIEBERMANN, lē'bēr-mān, MAX** (1847- ). A German painter who was born in Berlin, and studied at the University of Berlin, the Art Academy of Weimar and with Munkacz in Paris, Millet in Barbizon, in Holland, and in Munich. He was professor at the Academy of Berlin (1898- ). He is highly valued for groups like "Potato Harvest," "Darning Women," "Peasants Saying Grace," "Old Men's Home in Amsterdam," and also for portraits, best known among which are those of Gerhart Hauptmann, Virchow, and his "Self-portrait." He received medals in Berlin, Munich, Dresden, Venice, and in Paris, and also the ribbon of the Legion of Honor. He was president of the Academy of Arts in Berlin, was recognized as leader of the North German Secession and was honorary member of numerous foreign art academies and societies.

**LIEBKNECHT, lēp'knēkt, KARL** (1871-1919): A German Socialist leader (see Vol. XIII). Called to the army in 1915, he served

on the western front, which brought upon him violent censure from his party. Attacking the militarism of the Government in open session of the Diet in 1916, he was expelled and soon after convicted of high treason for participation in a Socialist May Day celebration. He was sentenced to four years of penal servitude and loss of civil rights, but was released in October, 1918. Engaging at once in revolutionary activities, he was killed by the Nationalists in the Berlin revolt of Jan. 18, 1919. Among his later works are *Gegen den Bürgerlichen Militarismus* (1920); *Politische Aufsätze aus seinem Nachlasse* (1921); *Reden und Aufsätze* (1921); *Studien über die Bewegungsgesetze der Gesellschaftlichen Entwicklung* (1922). See GERMANY, under *History*.

**LIECHTENSTEIN.** One of the smallest independent European states lying between the Austrian province of Vorarlberg and the Swiss cantons of St. Gallen and Graubünden. Its area is 65 square miles; its population (1912), 10,716. The revenue for 1928 was 685,651 francs and the expenditure 552,555 francs. In October, 1921, a new constitution providing for a Diet of 15 members, elected by direct vote on the basis of universal suffrage and proportional representation, was adopted. In 1924 the principality, heretofore the ward of Austria, joined the Swiss Customs Union and turned the administration of its posts and telegraphs over to Switzerland, besides using the Swiss currency since 1921. On Feb. 11, 1929, Prince Johann II, who had ruled Liechtenstein for more than 70 years died at the age of 88 and was succeeded by his brother, Prince Frances I, born Aug. 28, 1853.

**LIEFMANN, ROBERT** (1874- ). A German political economist, born at Hamburg. A professor of economics at the University of Freiburg since 1904, he has written *Die Unternehmerverbände* (1897); *Schutz Zoll und Kartelle* (1903); *Kartelle und Trusts* (1905, 4th ed., 1920); *Ertrag und Einkommen auf der Grundlage einer rein subjektiven Wertlehre* (1907); *Beteiligungs und Finanzierungsgesellschaften* (1909); *Die Unternehmungsformen* (1912); *Grundsätze der Volkswirtschaftslehre* (1917, 3d ed., 1923); *Allgemein Volkswirtschaftslehre* (1924).

**LIENHARD, LÉN'HÄRT, FRIEDRICH** (1865-1929). A German poet and novelist (see VOL. XIV). After 1925 he was doctor of theology at the University of Münster. His later works included *Der Einsiedler und Sein Volk* (1914), a volume of short stories; *Lebensfrucht*, his collected verse (1915); *Jugendjahre*, recollections of his youth (1918); *Westmark*, a novel (1919); *Der Meister der Menschheit* (1919); *Wer Zuletzt Lacht* (1921); *Aus Taulers Tagen* (1924); the novels *Unter dem Rosenkreuz* (1925) and *Des Meisters Vermöchniss* (1927); and a volume of causeries, *Das Plauderbuch* (1927). He edited *Der Türmer*, a magazine published in Weimar.

**LIGGETT, HUNTER** (1857- ). An American army officer, born at Reading, Pa. He was graduated at the United States Military Academy in 1879 and was made a second lieutenant in the 5th Infantry. By successive promotions, he reached the rank of major general in 1917 and was retired in 1921. He served in campaigns against the Indians and during the War with Spain was in Cuba, with the rank of major of volunteers. Later, he was in the Philippines, and subsequent to his return to the

United States, after various duties, he was sent to the Army War College, where he was graduated in 1910 and of which he was president in 1913. In 1914 he served on the Mexican border and in 1917 commanded the Department of the Philippines. During the World War, he was in France as commander of the 41st Division (1917-18) and then with the 1st Army Corps (1918-19) with the rank of lieutenant general. Later, he was on the Rhine in command of the 3d Army (1919). He took part in the second Battle of the Marne and participated in the engagement at St. Mihiel and in the Meuse-Argonne campaign. On his return to the United States, he was assigned to the command of the Western Department with San Francisco as his headquarters. In 1921 he was retired from active service with the rank of major general. For his services in the War, he received the Distinguished Service Medal of the United States, the decorations of the Legion of Honor from France, the Order of Leopold from Belgium. General Liggett wrote *Commanding an American Army; Recollections of the World War* (1925).

**LIGHT.** See PHYSICS.

**LIGHT, MEASUREMENT OF.** See ELECTRIC LIGHTING.

**LIGHTHOUSES, AND OTHER AIDS TO NAVIGATION.** After the restoration of normal conditions following the World War, there came important developments in lighthouses and their equipment, as well as in other aids to navigation in most of the countries of the world. Such developments are mainly in the provision of improved illuminants and signaling devices, in increasing the number of such marks as gas buoys, and particularly in installing radio apparatus for signals and for communications. In the construction of notable light towers or other structures, not much of importance was done between 1914 and 1928, but the improvement of equipment in the interest of better navigation, as well as general efficiency and economy, was significant. Thus, in the United States, the improvement of lights on rivers and bays was marked and the placing of acetylene buoys to mark the Ambrose Channel of the New York Harbor in 1920 was a distinct advance. On the Mississippi and Hudson rivers also there was a marked improvement in the lights. With the extensive development of aeronautics, lighthouse authorities were giving consideration to the utilization of coast lighthouses in aerial navigation, but little had been done in determining modifications needed for existing equipment. For the American Transcontinental Mail and other routes, elaborate systems of illumination and light marks were devised. At the end of the fiscal year 1927-28, 5877 miles of airways were lighted, with 1275 lights in operation. The number of lights was constantly being increased as new airways were provided for night flying. See AERONAUTICS.

**Automatic Lighting.** In the period following the War, automatic lighting was a leading consideration for the lighthouse service of the various countries of the World. It was extensively introduced, even at the more important stations, although in the latter instances one keeper usually was retained, and the installation was quite costly. Such lights for the most part employed dissolved acetylene, and for the higher illuminating power, there was a lens revolved by the gas pressure, while the flame was produced by the combustion of a mixture of acetylene and air

under an incandescent mantle, with automatic mantle exchanger. European automatic lights and light sectors were in many cases more complicated than those employed in the United States. Automatic lighting by incandescent electric lamps had been extensively developed in some countries for unwatched or semi-watched stations, even those of primary importance. Here were often employed large light bulbs approximating 1 foot in diameter, with spirally wound filaments in gas-filled bulbs. The large current required was supplied from commercial sources or by automatic power units at the station. In some of the apparatus, particularly that for the coast of Holland, where this system was extensively introduced, the electric light had a reserve gas light which was automatically set in operation on the failure of the electric light.

The United States Lighthouse Service in 1928 had in commission more automatic apparatus than similar services in any other country in the world. Of 6761 coast and lake lights, 2210, or 33 per cent, were automatic, doing the work of many lighthouse keepers and assistants. This includes 893 lighted buoys, which could not be maintained by human attendance and which were invaluable aids to mariners, were automatically operated, and aided night navigation on many important rivers and channels. This tendency to provide automatic installations is indicated by the fact that during the fiscal year 1928, 158 stations were put on an automatic basis, with an annual saving estimated at three-quarters the cost of the changes. Thus, in addition to many automatic gas buoys, new automatic lighthouses were installed at important points.

**Fog Signals.** A most important development in the way of improving coastwise navigation was fog signals which by the use of radio were to send out from transmitting stations signals appropriate to the locality. These could be detected on vessels equipped with ordinary receiving apparatus. The first radio fog signals in the United States were placed May 1, 1921, on the Ambrose Channel light vessels at the entrance to New York Harbor, on the Fire Island light vessel, and on the Sea Girt (N. J.) lighthouse, all in the vicinity of New York Harbor. By 1928 there were 55 radio beacons in operation, most of the important light stations and lightships being thus equipped. These instruments furnish, with proper precautions, bearings approaching the accuracy of visual bearings, and were available at greater distances. See RADIO TELEGRAPHY.

In 1924 a power-tube radio fog signal transmitter was placed in commission on Ambrose Channel lightship. This was the first tube transmitter used in the United States for fog signal purposes. This transmitter was installed by the United States Lighthouse Service after extensive tests indicating freedom from directional distortion, lessened interference, and increased efficiency. Installations of radio fog signals had been provided in France, Spain, Norway, Scotland, England, and Holland, though less extensively than in the United States. It was universally recognized that instruments for determining the radio bearing should be located on shipboard, and the radio compass (see NAVIGATION) a simple means of securing direction and position, is rapidly becoming standard ship equipment. Aside from the use of radio, the principal advance noted in fog signals was the further introduction of automatic apparatus for minor signals, such as bells, along the lines described or similar.

**United States Lighthouse Service.** On June 30, 1928, there were maintained by the United States Lighthouse Service, which is by far the largest lighthouse organization in the world, 18,007 aids to navigation, including 6761 lights of all classes and 1313 fog signals of which 55 were radio signals and only 36 were submarine signals. The accompanying table gives a summary of the aids to navigation under each class in commission at the end of the fiscal years 1914 and 1928.

Class	June 30, 1914	Total, June 30, 1928
<b>Lighted aids:</b>		
Lights (other than minor)	1,588	2,248
Light-vessel stations	52	46
Gas buoys	453	554
Gas buoys with whistles and bells *	...	334
Minor lights	2,798	3,392
Floating lights	118	187
Total lighted aids	5,004	6,761
<b>Fog signals:</b>		
Radio	...	55
Sound fog signals (air)	519	558
Submarine fog signals	48	87
Gas buoys, with whistles and bells *	...	334
Whistling buoys, unlighted	86	81
Bell buoys, unlighted	233	253
Total fog signals	886	1,313
<b>Unlighted aids:</b>		
Buoys	6,330	7,664
Day beacons	1,978	3,203
Total	8,308	10,867
Grand total	14,198	18,007
* Gas buoys with whistles and bells are counted only once in the grand total.		

In the period between 1910 and 1920, there was a net increase of 4611 in the total number of aids to navigation in the United States. The number of gas buoys increased two and one-half times and the number of lighthouses, equipped with brilliant oil-vapor lights, increased four times. The number of automatic gas lights ashore increased nearly seven times, effecting an important economy in the cost of attendance. By 1928 radio equipment had been placed on more than half of the tenders and telephone communications between shore stations. Acetylene buoys were in standard use and were placed at important channels.

In Alaska during the period from 1914 to 1928, many new aids to navigation were established, so that on June 30, 1928, there had been provided a total of 779 aids to navigation in this Territory. This was a steady growth from 1910, when there were but 160 such aids. In 1928 there were 284 lights, 26 gas buoys, 16 fog signals, 283 buoys, 170 day marks, and 2 radio beacons. The United States Lighthouse Service had been active in the other Territories and outlying districts, where increased commerce rendered additional aids to navigation essential. Thus, in 1921 there was built a new light station and buildings at Point Borinquen, at the northwestern extremity of Porto Rico, at a location where the necessity of a landfall light was emphasized by the opening of the Panama Canal and its increasing use. This new light was placed on a reinforced concrete structure of cylindrical form located 233 feet above sea level. It was simple in design and heavy and strong enough to resist earthquake shocks. It was built on a concrete foundation 25 feet square by six feet deep, and the main tower was 15 feet in diameter with walls 15 inches thick and rising to a height of 46 feet; above it was a service room and a standard helical bar lantern. The illuminating apparatus consisted of a third-



order 12-panel flashing lens on a mercury float with a 55-mm. type-A incandescent oil-vapor lamp. This light shows a group of four white flashes of 32,000 candle power every 30 seconds and is visible 24 miles. At Guam, a valuable new light was installed at Hole-in-the-Wall in 1923 by the United States Lighthouse Service. Lights also were maintained at both Guantanamo and Samoa.

At these last three points, the aids to navigation are maintained under the direction of the Naval Commandant by means of allotments from the appropriations for the Lighthouse Service. Also in 1928 an important new light was completed by the Government of the Philippine Islands on Tubbataba Reef in the centre of the Sulu Sea about 90 miles from the nearest land. In this construction, a light steel tower about 120 feet high carries the light, and concrete buildings at the base are provided for the three keepers and two boatmen and their families.

The coastwise light and aids to navigation in Great Britain are under the control of Trinity House, the oldest brotherhood of seamen in Great Britain, incorporated under Henry VIII in 1514. This organization in 1920 administered 64 large and 27 minor lighthouses; two fog signal stations; 46 manned and two unmanned lightships; 130 lighted and 479 unlighted buoys; and 55 beacons. There are nine lighthouse tenders which steam upward of 100,000 miles a year. Trinity House is constantly conducting experiments in lighting and fog signaling, and many of the lightships are fitted with wireless telephony for communication with the shore.

**LIGHTNING.** See METEOROLOGY.

**LIGHTNING ARRESTER.** See ELECTRIC POWER TRANSMISSION AND DISTRIBUTION.

**LIGHTSHIPS.** See LIGHTHOUSES.

**LIGNE, lē'ny', ALBERT ÉDOUARD EUGÈNE LAMORAL, PRINCE DE (1874- ).** A Belgian diplomat, Ambassador to the United States (since 1927). He started his career as an attaché in Vienna (1896), was posted at Berlin (1898-1903) and Lisbon, and then served under the Secretary of State for Foreign Affairs of the Congo State until that was made a Belgian colony (1908). He then entered the Colonial Office, but in 1911 returned to the diplomatic service, going to Holland as counselor of the Belgian Legation, to Luxemburg as chargé, and returning to Holland as Minister (1920-26).

**LILLENFEIN, lē'lī-en-fīn, LIEHRICH (1870- )** A German dramatist and novelist. He was born at Stuttgart and studied history and philosophy at the universities of Tübingen and Heidelberg. He became general secretary of the *Deutsche Schillerstiftung* at Weimar in 1920. His principal works were the dramas *Maria Friedhammer* (1903); *Der Herrgottswarter* (1906); *Der Stier von Olivera* (1910); *Der Tyrann* (1913); *Hildebrand* (1918); *Cagliostro* (1922); *Der Erlösung des Johannes Parriocida* (1925); and *Theater* (1927); and the novels *Ein Spiel im Wind* (1916); *Die feurige Wolke* (1919); *Das Trunkene Jahr* (1923); and *Die Welt ohne Seele* (1927).

**LILLIE, RALPH STAYNER (1875- ).** An American physiologist, born at Toronto, Ont., Canada. He was educated at Toronto University, at the University of Michigan, and at the University of Chicago (Ph.D., 1901). He was instructor in physiology and histology (1902-03) and adjunct professor (1903-05) at the University of Nebraska; instructor in phys-

iology at Harvard (1905-06); instructor in physiology and zoölogy (1907-11) and assistant professor (1911-13) at the University of Pennsylvania; professor of biology at Clark University (1913-20); biologist at the Nela Research Laboratory, Cleveland, Ohio (1920-24); professor of general physiology at the University of Chicago since 1924; and instructor in physiology at Woods Hole, Mass., from 1902. He published extensively in scientific journals on osmotic pressure of colloids, physiology of growth processes, and articles on protoplasmic transmission.

**LIMBURG.** Upon the region of South Limburg, in southeastern Holland, centred the chief Belgian demand for territorial compensations after the World War. This Dutch province, with an area of 847 square miles and a population (Dec. 31, 1927) of 521,002, had been given to Holland by the Treaty of 1839, against the protests of the Belgians. At the Versailles Conference, Belgium once more pressed her claims, not on grounds of ethnography, for the people are plainly Dutch, but for historical, strategic, and economic reasons. Limburg had taken part in the Belgian Revolution of 1830. It was vitally necessary for the protection of the Belgian frontiers, for it dipped south to touch Belgium on the east and thus controlled the defense of the Meuse. The position of the Meuse in the disputed district was perhaps the most serious of the Belgian grievances, for the Dutch possession of this waterway, with its important bridgehead at Maastricht, imposed an effective check on the progress of Belgian commerce. Similarly, Limburg seemed vitally necessary to Belgium if the Rhine-Scheldt Canal, which was guaranteed by the Peace of Versailles, was ever to become a reality. Limburg, formerly neglected by the Dutch, became a source of real interest during the War; the lignite mines opened up there were producing 1,425,617 tons in 1918 and some 9,323,012 tons in 1927. The Peace Conference, however, refused to countenance the transfer of the territory; the only step it would take was the establishment of an international commission to investigate the matter of the Treaty of 1839. Territorial compensation was thus out of the question. Only after lengthy negotiations was it possible for the two disputants to come to terms on the matter of waterways. In 1920 an agreement was reached on the administration of the Scheldt, the Antwerp-Meuse-Rhine Canal, and two other water systems; with this, Belgium had to remain content.

**LIME.** The number of plants engaged in the production of lime in the United States decreased from 530 in 1922, to 430 in 1928. Keener competition in recent years has featured the lime industry and numerous consolidations, with elimination of the less efficient producers, has resulted. The more important producing districts are in southern Pennsylvania, the Toledo district of Ohio, and the Shenandoah districts of Virginia and West Virginia. In 1922 a total of 3,639,617 short tons of lime was produced. The value of this production was \$33,255,039, or \$9.14 per ton. In 1928 production had increased to 4,458,412 tons, valued at \$36,449,635, or a value of \$8.40 per ton. About one-half of the lime produced is used in the building trades. The consumption of agricultural lime has not shown a relative increase in recent years, being about 7.5 per cent of the total.

In addition to the important and essential use of lime in building and agriculture, various chemical industries, such as paper mills, glass works, tanneries, metallurgical plants, sugar factories, and various other chemical and semi-chemical industries are important consumers of lime. By means of the air separation process, a very pure lime product is secured that is easily handled and shipped, all of which aids in the development of new markets, and the extension of old markets for lime products in the chemical manufacturing industries. Recent developments in the technology of lime production indicate a trend toward more general adoption of the rotary-type kiln, and a more general tendency to seek a market for the waste-rock products and spalls that must be handled in connection with the production of lime.

**LIMING.** See FERTILIZERS.

**LINCOLN, JOSEPH CROSBY (1870- )**. An American story writer (see VOL. XIV). To his list of tales of the Cape Cod region, he has added: *Thankful's Inheritance* (1915); *Mary 'Gusta* (1916); *Enslaving Obadiah* (1917); *Shavings* (1918); *The Portygee* (1919); *Galusha the Magnificent* (1921); *Fair Harbor* (1922); *Doctor Nye* (1923); *Ragged Water* (1924); *The Big Mogul* (1926); *The Aristocratic Miss Brewster* (1927); *Silas Bradford's Boy* (1928); and (with Freeman Lincoln) *Blair's Attie* (1929).

**LIND, SAMUEL COLVILLE (1879- )**. An American chemist, born at McMinnville, Tenn. He was graduated at Washington and Lee University in 1899 and the Massachusetts Institute of Technology and received his Ph.D. at Leipzig, Germany. He was assistant in chemistry at the Massachusetts Institute of Technology and assistant professor of general and physical chemistry at Michigan (1905-15). Meanwhile, he became interested in radioactivity and studied in Paris (1910) and at the Radium Institute in Vienna (1911). In 1913 he was appointed chemist for the United States Bureau of Mines in charge of radioactivity, and in 1918 he became physical chemist for that bureau. He was associate director of the Fixed Nitrogen Research Laboratory at Washington, 1925-26, and since 1926 he has been director of the school of chemistry at the University of Minnesota. Dr. Lind published papers on radium extraction and measurement, on the influence of radiation on chemical action, and relation of gaseous ionization to chemical action; he is also the inventor of the Lind interchangeable electroscope for making radium measurements.

**LINDBERGH, CHARLES AUGUSTUS (1902- )**. An American aviator. He was born at Detroit, Mich., graduated from the high school at Little Falls, Mich., and studied mechanical engineering at the University of Wisconsin (1920-22). At the age of twenty, he enrolled in an aviation school at Lincoln, Nebr., and there took his first airplane flight (April, 1922). In 1924 he enrolled as a flying cadet in the U. S. Air Service Reserve at Brooks Field, San Antonio, Tex. (He was later advanced to captain, and then to colonel, of the Air Corps Reserve). In 1925 he was commissioned first lieutenant of the Missouri National Guard and later was promoted to colonel. In 1926 he entered the Air Mail Service as pilot from Chicago to St. Louis. On May 11, 1927, he took off from San Diego, Calif., in an airplane made to his order

and called the *Spirit of St. Louis*. Stopping 25 minutes at St. Louis, he landed at Curtiss Field, N. Y., on the following day (flying time, 21 hours and 20 minutes). On May 20, he took off alone in the same plane on a non-stop transatlantic flight from Roosevelt Field, N. Y., to Paris, France, covering an estimated distance of 3600 miles in 33½ hours. His reception at Paris and later at London and Brussels was unprecedented for cordiality. After his return to the United States and an official welcome from President Coolidge, he made an air tour in the *Spirit of St. Louis* to 75 cities in the interest of commercial aviation. On the invitation of President Calles of Mexico, he made a non-stop flight of 2100 miles from Washington, D. C., to Mexico City in 27 hours and 10 minutes. He later visited Central America and the West Indies. He was awarded the Congressional Medal of Honor (U. S.), the Distinguished Flying Cross, the Distinguished Service Cross, the Woodrow Wilson Medal and \$25,000 for the good-will flight to Mexico, Central America, and the West Indies, the Roosevelt Medal of Honor (1928), the Langley Medal of the Smithsonian Institution, the Hubbard Medal of the National Geographic Society, the French Legion of Honor, and many other decorations. He was the winner of the Orteig \$25,000 prize for the first New York to Paris non-stop flight. Colonel Lindbergh was made chairman of the technical committee of the Transcontinental Air Transport, and in this capacity has given much attention to the planning and location of commercial air routes throughout the United States and Latin America. In 1929 he married Anne S., daughter of Dwight W. Morrow, then American Ambassador to Mexico. He wrote *We* (1927), the story of his transatlantic flight.

**LINDMAN, S. ARVID ACHATES (1862- )**. A Swedish admiral and Prime Minister, born at Osterby. He served in the navy from 1882 to 1891, when he entered business. Elected to Parliament in 1905, he became Minister for Navy the same year, and Prime Minister (1906-11). He was Minister for Foreign Affairs in 1917 and then was leader of the Conservative Party in the Second Chamber until called to head the Conservative cabinet formed Oct. 1, 1928.

**LINDSAY, (NICHOLAS) VACHEL (1879- )**. An American poet and artist (see VOL. XIV). In 1910, when he published the *Village Magazine*, he was almost unknown, but since then, he has been recognized as one of the main hopes of American poetry. Technically and esthetically, he is full of inaccuracies, but his poetry is strong and vital and many of his poems have the true ballad ring. He is one of the strongest forces in the development of the epic of the West in the United States. He has recited before many school audiences in this country and in England. His chief works are *Handy Guide for Beggars* (1910); *The Art of the Moving Picture* (1915); and the volumes of poems entitled *General Booth enters Heaven* (1913); *Congo and Other Poems* (1914); *The Chinese Nightingale and Other Poems* (1917); *The Golden Whales of California and Other Poems* (1920); *The Golden Book of Springfield* (1920); *Going to the Sun* (1923); *Collected Poems* (illustrated by himself, 1925); *Going to the Stars* (1926); *The Candle in the Cabin* (1926); *The Litany of Washington Street* (1928); *Johnny Applesseed and Other Poems*; *Every Soul is a Circus*, poems (1929).

**LINDSAY, WALLACE MARTIN** (1858- ). A Scottish classicist (see VOL. XIV). His more recent publications include *Notæ Latinae* (1915); edition of the *Corpus Glossary* (1921); *Corpus, Epinal, Erfurt, and Leyden Glossaries* (1921); *Ancient Lore in Medieval Latin Glossaries* (1922); *Early Latin Verse* (1922); *Julian of Toledo* (1922); *Glossaria Latina*, vols. 1-3 (1926); edition of Terence (1926).

**LINDSEY, BEN (JAMIN) B(ARR)** (1869- ). An American purist and reformer (see VOL. XIV). He was active in the organization of the Progressive Party and was a member of its National Committee in 1912. Judge Lindsey served in the Juvenile Court of Denver until July 1, 1927. He lectured much throughout the country on children's problems. He was the author of *The Rule of Plutocracy in Colorado*; *The Doughboys' Religion* (1919); *Pan-Germanism in America* (1919); *The Revolt of Modern Youth* (1925); and *The House of Human Welfare: The Companionate Marriage* (1927).

**LIPPMANN, WALTER** (1889- ). An American writer (see VOL. XIV). He resigned as a member of the staff of the *New Republic*, in 1915, to become assistant to the Secretary of War. He served also as secretary for the organization directed by E. M. House to prepare data for the Peace Conference. During the World War, he served as captain of the Department of Military Intelligence. He was attached to the 2d Section of the General Staff at General Headquarters in France. He served also in Paris during the Peace Conference. His later books include *The Political Scene* (1919); *Liberty and the News* (1920); *Public Opinion* (1922); *The Phantom Public* (1925); and *Men of Destiny* (1927); *A Preface to Morals* (1929). He joined the editorial staff of the *New York World* and in 1924 became its chief editorial writer.

**LISSAUER, ERNST** (1882- ). A German poet. He was born in Berlin and studied at Leipzig and Munich. He first attracted attention by his lyric volume, *Der Acker* (1907), which was followed by *Der Strom* (1912), a tribute to the centenary of the Wars of Liberation, entitled *1813*, and *Zyklus* (1913). At the outbreak of the World War, he published a series of pamphlets, *Worte an die Zeit* (1914), and attained notoriety by his *Hymn of Hate*. He later wrote two dramas, *Eckermann* and *York* (1921); a series of one-act plays, *Gesichte* (1922); the essays, *Von der Sendung des Dichters* (1922) and *Festlicher Werktag* (1922); *Flammen und Winde*, poems (1922); *Gewalt*, a comedy (1924); *Die dritte Tafel*, a legend (1927). He edited an anthology *Deutsche Balladen* (1923) and works of Mörike, Kopisch, Lingg, and others.

**LITCHFIELD, ELECTUS DARWIN** (1872- ). An American architect, born in New York City. He was graduated from the Brooklyn Polytechnic Institute in 1889 and from the Stevens Institute of Technology in 1892. He began his professional work with Carrère & Hastings in New York and was afterward associated with several other architectural firms in that city. In 1919-26 he was a member of the firm of Electus D. Litchfield & Rogers. Since 1926 he has been in practice under his own name. He designed the United States Post Office and Courthouse in Denver; the St. Paul Public Library; the James J. Hill Reference Library in St. Paul; and many important buildings in Washington, Brooklyn, and other cities. He was archi-

tect and town planner for Yorkship Village, a permanent industrial town of 1700 houses built during the World War for the Emergency Fleet Corporation and the New York Shipbuilding Company. He is a member of several architectural and other societies.

**LITERATURE.** See FRENCH LITERATURE; GERMAN LITERATURE; HUNGARIAN LITERATURE; ITALIAN LITERATURE; RUMANIAN LITERATURE; RUSSIAN LITERATURE; SCANDINAVIAN LITERATURE; SPANISH LITERATURE; SLAVONIC LITERATURE; and LITERATURE, ENGLISH AND AMERICAN.

**LITERATURE, ENGLISH AND AMERICAN.** Any survey of English and American literature from the outbreak of the World War must necessarily take count of the fact that for the first four years of the period the world was in arms. No less must it premise discussion on the statement that though the stream of letters was stirred to its depths by the contest, it has followed since the conclusion of the struggle the direction in which it was setting when war broke. The War stimulated the revolt which was under way against established conventions of thought and action; it crystallized discontent, fructified emotion, and unfettered expression, but it marks no watershed in literary annals. Its results to the present have been rather to nurture seriousness than to transform letters.

Viewed in the perspective of today, the literature of the war years themselves appears, for the most part, ephemeral. Of that vast mass of publications which, as the struggle progressed, ranged from inquiry into its causes to description of the manner and incidents of its waging and eventually to discussion of the peace, few have had currency beyond the lustrum that called them forth. Even the correspondence from the men at war, which derived so moving a quality from the idealism which tempered its grim chronicle, and which, at its best, as in the letters of Victor Chapman, Alan Seeger, Rupert Brooke, or Donald Hankey, had so impressive an eloquence, has passed to the limbo of topical literature. Into similar oblivion has gone the great part of the narratives of the war correspondents, the travelers beleaguered in Europe, and unofficial observers, records whose precarious popularity must henceforth rest upon their value as secondary sources of history. A few exceptions there are to this rule. In Masfeld's *Gallipoli*, an imagination capable of conveying the epic nature of the drama unfolding before it transmuted a recital of events into literature that still has power to stir. T. E. Lawrence, in the remarkable *Revolt in the Desert*, furnished a chronicle of experience that stands as one of the most effective as well as one of the most fascinating works born of the War. In H. W. Nevins's *The Dardanelles Campaign*, Philip Gibbs's *The Battles of the Somme*, and the reports of Richard Harding Davis and Frederic Palmer, there was sufficient of literary effectiveness to attach to them a degree of permanence.

It is, however, to other sources we must look for the war literature that must be history. So long as the conflict was in progress, the necessities of the situation imposed an obligation to silence; but the conclusion of peace released the pens of the diplomats, and lifted the embargo on the utterances of military leaders. From the United States in 1918 came Brand Whitlock's *Belgium*, one of the most notable books produced by the conflict, a work of importance historically and possessing no little literary qual-

ity. Vivid and revealing as it was, the outstanding diplomatic memoir of the war period was not, however, that of Mr. Whitlock, but *The Life and Letters of Walter Hines Page*, by Burton Hendrick, a collection of letters impressive for their recital of Anglo-American relations during the war epoch and for the mellow personality and grace of style that invested their record with abiding interest. Together with these reminiscences may be placed as of lesser but nevertheless high interest Ambassador Gerard's *My Four Years in Germany* and *Face to Face with Kaiserism*, Ambassador Morgenthau's *Story*, Lewis D. Einstein's *Inside Constantinople*, and Hugh Gibson's *A Journal from Our Legation in Belgium*.

Close upon the end of the conflict, the military leaders entered the literary lists, some of them to combat criticism, others merely to tell the story of their experiences. Viscount French, Sir Frederick Maurice, Julian Corbett, Admiral Jellicoe, Field Marshal Haig, Commander Belaire, Admiral Fisher, Admiral Sims, Sir Ian Hamilton, and others of their associates on land and sea published narratives that must hold permanent place as history. Supplementing these more personal chronicles and of hardly less value as source books of the future, there appeared a stream of works of which some of the most notable were Winston Churchill's *The World Crisis*; *The Economic and Social History of the War*, edited by James T. Shotwell; Charles Seymour's *A Diplomatic Background of the War* and *Woodrow Wilson and the World War*; Charles G. Dawes's *A Journal of the Great War*; Lord Beaverbrook's *Politicians and the War*; H. W. V. Temperley's *A History of the Peace Conference at Paris*; Ray Stannard Baker's *Woodrow Wilson and the World Settlement and Life and Letters of Woodrow Wilson*; and Robert Lansing's *The Peace Negotiations, a Personal Narrative*. Of the first importance, *The Intimate Papers of Colonel House*, edited by Charles Seymour, reveals a remarkable personality at the same time furnishing a rich quarry for future history. Valuable also for the light it sheds upon his associates of the war years is the Earl of Oxford and Asquith's *Memories and Reflections*.

Definite histories of the war it is too soon to expect, but several preliminary treatises presenting panoramic surveys of the contest have made their appearance. Such are *Nelson's History of the War*, by John Buchan; Buchan's *History of the Great War*; Conan Doyle's *History of the Great War*; and Frank Simond's *The Great War*. While giving rise to a vivid curiosity as to the period immediately antecedent to its outbreak, the War at the same time directed attention to the more distant past. Specialized fields of interest came suddenly to the fore, as when the doctrine of self-determination brought the smaller nationalities into prominence, or discussion of a league of nations threw emphasis on earlier experiments in restraint of war.

On the other hand, the entire pageant of history assumed a new significance and, subjected to painstaking research, was made to yield fresh import as its data were interpreted not as by the older historians, through the medium of personal or national prejudice, but with the detachment of scientific investigation. Ancient times, as well as modern, were tapped at their sources, with the result that the recent

years have seen a steadily growing body of authoritative history. The important series of Cambridge histories—the *Cambridge Mediæval History*, the *Cambridge History of Modern Times*, the *Cambridge History of India*, the *Cambridge History of the British Empire*; the series entitled *The Legacy of Greece and Rome* and *Our Debt to Greece and Rome*; the *Chronicles of America*, edited by Allen Johnson; *The Second Empire*, by Philip Guedalla; *The Evolution of Parliament*, by A. F. Pollard; *The Age of the Reformation*, by Preserved Smith; *Modern Democracies*, by Viscount Bryce; *The History of British Civilization*, by Esme Wingfield Stratford; *The History of the United States since the Civil War*, by Ellis Paxson Oberholtzer; *The McKinley and Roosevelt Administrations*, by James Ford Rhodes; *The Declaration of Independence*, by Carl Becker; *The History of Modern Europe*, by G. P. Gooch; *The Beginnings of New England*, *Revolutionary New England*, and *New England in the Republic*, by James Truslow Adams; *The Supreme Court in United States History*, by Charles Warren; *The Rise of American Civilization*, by Charles A. and Mary R. Beard; *The Turn of the Century*, by Mark Sullivan; *The History of American Life*, edited by Arthur Schlesinger and Dixon Ryan Fox; and *The Origins of the War*, by Sidney B. Fay—are works representative of the range and character of historical research during the period under consideration.

That in an age of specialization, and at a period when history more uniformly than ever before had become categorical and documentary, the "outline" should spring to such wide popularity as it has attained in the recent past in H. G. Wells's *The Outline of History*, Hendrik Van Loon's *The History of Mankind*, and the books in related fields that followed their fashion, may at first glance seem an anomaly. Yet it is in truth but the logical result of the scientific development of historical study. For history has grown too complex in the light of contemporary research, and in its conjunction with economic, social, and environmental factors, to be followed in detail by any but the scholar. The outline, with its swift portrayal of the march of mankind from primitive beginnings to the highly organized society of today, provides the means to that bird's-eye view of human history which is a minimum essential to the understanding of the present; and when invested with the dramatic quality which the daring of a Wells bestowed upon it, the success of the epitome of history is easily comprehensible.

If history has flourished in the period under consideration, biography has had no less robust a growth. No longer ago than when he finished the preface to *Eminent Victorians*, Lytton Strachey could bemoan the fact that the writing of biography had fallen upon evil days in England; and not much later Philip Guedalla leveled the shafts of his wit upon the "historians' English" which was not "a style but an industrial disease," and which was at its unhappiest to his mind when it dealt with character. Both Mr. Strachey and Mr. Guedalla, however, were writing before themselves; since their emergence, pungency and Freud have lent an enormous vogue to biography. More than any field of literature except fiction it has responded to the interest in the new psychology which has been the dominant preoccupation. Biographical writing has advanced far indeed from its old conception of

a life as a mere succession of incidents to the analysis of such a book as Van Wyck Brooks's *The Ordeal of Mark Twain*. Under the handling of writers who, like Brooks, Lytton Strachey, and Gamaliel Bradford, apply though in differing fashion and degree the psychological method to career and personality, it has become an essay in interpretation rather than a chronicle. As a result, it has gained brilliance and suggestiveness and grown in favor, but it has laid itself open to the charge of eccentricity when written by the less scientific and to the danger of being considered an argument to a thesis even when practiced by the ablest of its exponents. Mr. Strachey, whose *Eminent Victorians* and *Queen Victoria* have not only brought biography but almost the Victorian age into favor, achieved equal success with *Elizabeth and Essex* now bids fair to win similar interest for a more distant period, and Francis Hackett, whose *Henry the Eighth*, is a biography in which accurate historical detail bears all the picturesqueness of romance, applies impressionism to an epoch as well as to personalities, while Mr. Bradford in *American Portraits, Damaged Souls, and Bare Souls*, uses a psychological, as Mr. Brooks does a psychoanalytical, method in his characterization. As a result, biography as it is being written today by its most brilliant popular exponents represents not detached description and appraisal but an evaluation in which the personality of the author inevitably fastens its stamp upon that of the hero.

Curiously enough, in a period which began in violent reaction against its philosophy and practice, much of the biographical writing since the War has dealt with the Victorian era. Victorian gods may be dethroned, but their shadow is still mighty in the land. From the painstaking research of Monypenny and Buckle's monumental life of Disraeli and the informed chronicle of Lady Gwendolen Cecil's *Life of Robert Marquis of Salisbury*, through the audacious egotistries of *Margot Asquith: An Autobiography* with her recollections of artists, actors, and musicians, Victorian reminiscence has run the gamut of politics and the arts. Government and diplomacy, Victorian and later, have found spirited reflection in such works as *The Private Diaries of the Rt. Hon. Sir Algernon West*, edited by Horace G. Hutchinson; the *Diaries of Wilfred Scawen Blunt*; *The Letters of Lord and Lady Wolseley*, edited by Sir George Arthur; *Lady Paget's Embassies of Other Days*; A. G. Gardiner's *The Life of Sir William Harcourt*; Lord Frederic Hamilton's *The Day before Yesterday*; Sir Harry Johnston's *The Story of My Life*; Viscount Morley's *Recollections*; Lord Asquith's *Fifty Years of British Parliament*; Viscount Grey's *Twenty-five Years*; J. A. Spender's *Life, Journalism, and Politics*, and the Earl of Birkenhead's *Law, Life, and Letters*. Literature and art are represented in biographical or autobiographical form in *Unpublished Letters of Matthew Arnold*, by Arnold Whitridge (a book written and originally published in America); the three-volume life, *Carlyle*, by Davis Alec Wilson; *Letters of Thomas Carlyle to John Stuart Mill, John Sterling, and Robert Browning*, edited by Alec Carlyle; *Thackeray and His Daughter*, edited by Hester Thackeray Ritchie; the *Life of Shelley*, by Walter Edwin Peck; *W. S. Gilbert, His Life and Letters*, by Sidney Dark and Rowland Grey; *Changes and Chances, and More Changes, More Chances*, by H. W.

Nevinson; *The Adventure of Living*, by J. St. Loe Strachey; *My Life and Some Letters*, by Mrs. Patrick Campbell; *Letters and Papers of John Addington Symonds*, edited by Horatio F. Brown; *John Ruskin's Letters to William Ward*, and *The Early Life of Thomas Hardy*, by Florence Emily Hardy.

American personal history since 1914 has in some of its most important expressions been autobiographical. Close to the opening of the period, Thayer's *Life and Letters of John Hay* wove into a rich pattern achievement and literary accomplishment, furnishing interesting commentary on contemporary political annals. Few biographies of recent years have equalled in interest, from the point of view of psychology, *The Education of Henry Adams*, a remarkable human document, in which the author depicts the play of quintessentially New England influences upon a sensitive nature. Like the *Life and Letters of John Hay* and *The Education of Henry Adams*, the volumes of letters by William and Henry James constitute permanent contributions to literature, one portraying a mind of widest philosophic scope, sturdy in its Americanism, and the other, a personality finding fulfillment possible only outside its native land, but for all its cosmopolitan overlay, essentially of its nation. Racy of the American background, though in widely variant fashion, are Hamlin Garland's *A Son of the Middle Border*, *A Daughter of the Middle Border*, and *Backtrailers of the Middle Border*, with their vivid depiction, in the earlier volumes, of pioneer life and the reflection of a literary career in the last. Theodore Dreiser's *A Book about Myself*; Theodore Roosevelt's *Letters to His Children* and *Diaries of Boyhood and Youth*; Robert Underwood Johnson's *Remembered Yesterdays*; William Dean Howells's *My Life in Letters*, edited by his daughter, Mildred Howells; Booth Tarkington's *The World Does Move*; George W. Cable's *His Life and Letters*, by Lucy Leffingwell Bikle; M. T. Werner's *Barnum*, the record of a career unthinkable outside of America, and his *Brigham Young*; Royal Cortissoz's *Life of Whitelaw Reid*; Henry Watterson's *Recollections*; Kate Douglas Wiggin's *My Garden of Memories*; the *Life of E. H. Harriman*; *The Americanization of Edward Bok*; Michael I. Pupin's *From Immigrant to Inventor*; Jim Tully's *Beggars of Life and Shanty Irish*; Robert H. Fuller's *Jubilee Jim*; Sherwood Anderson's *A Story-Teller's Story*; and Paxton Hibben's *Henry Ward Beecher*.

Since the War, American political biography has added to its credit Joseph Bucklin Bishop's *Life of Roosevelt*; the authorized biography, *Grover Cleveland*, by Robert McElroy; *Samuel Adams, Promoter of the American Revolution*, by Ralph Harlow; *Lives of Washington* by W. E. Woodward and Rupert Hughes; *Claude Bowers's Jefferson and Hamilton*; W. E. Woodward's *Meet General Grant*; Allan Nevins's *Frémont, Trail Blazer*; *The Life of Roger Brooke Taney, Chief Justice of the United States Supreme Court*, by Bernard C. Steiner; and Beveridge's exhaustive life of Chief Justice Marshall, indispensable to the student of his period. Quite as indispensable, though unfortunately left uncompleted by the death of the author, is Beveridge's *Life of Lincoln*, a work projected on a comprehensive scale and exhaustive in its research into the career of Lincoln as a legislator. Less animated in style and with nothing of the poetic sentiment that



lent so much of its appeal to Carl Sandburg's *Abraham Lincoln: The Prairie Years*, Senator Beveridge's work is a work far more scholarly and notable.

One of the fruits of the new biography, so far as America is concerned, is an enormous interest in some of the minor figures of the country's history. The annals of crime, of business, of adventure, even of love, have been combed with the result that there has been an outcropping of melodramatic chronicles. Such books as *The Saga of Billy the Kid and Tombstone*, by Walter Noble Burns, *The Making of Buffalo Bill*, by Richard J. Walsh and Milton S. Salisbury; *Calamity Jane*, by Duncan Aikman; *The Terrible Siren*, by Emanie Sachs, a biography of Victoria Woodhull, are indicative of the types of character which have been exploited. Some of these many studies are of distinct historic value.

Perhaps of all forms of literature, the essay most demands for its fertilization the quiet and contemplative mind. War and the aftermath of war in radical thought and propaganda were little conducive to armchair philosophy, and the dearth of outstanding work in the field of the essay during the years following it is easily explicable in view of the prevailing turmoil. Both in England and America, however, the essay and the essay in criticism have increasingly been coming into their own. In the United States, indeed, criticism has had a development which is one of the most striking features of contemporary American literature. Never before in this country has there been so widespread a public for critical writing or so many organs devoted partially or predominantly to its uses. The late Stuart P. Sherman, Paul Elmer More, H. L. Mencken, Henry S. Canby, Joseph Wood Krutch, Mary Colum, Carl Van Doren, Van Wyck Brooks, and a goodly fellowship of able if less noted critics have produced works of genuine distinction.

In the former country, J. B. Priestley, Virginia Woolf, Rebecca West, Edmund Gosse, who up to his death continued to practice an art that had long been notable for its learning, its grace, and its nice discrimination, Arnold Bennett, Frank Swinnerton, and Wyndham Lewis, to name but a few of many, have lent vigor and interest to critical writing. In the United States, such writers as Lewis Mumford, with his *Sticks and Stones* and *The Golden Day*, Elmer Davis with *Show Window*, Simeon Strunsky, with his journalistic and literary essays, and Lee Wilson Dodd, with the *Golden Complex*, have turned acute intelligence and active pens to the depiction of contemporary events and culture, while in numerous essays Christopher Morley has carried on the tradition of the English essay at its most graceful and mellow period. To America may be accredited two of the outstanding studies in literary interpretation of recent years—Amy Lowell's *John Keats*, an exhaustive and painstaking biography and analysis of the poet, and John Livingston Lowes's *The Road to Xanadu*, a life of Coleridge which is primarily a discussion of the genesis and operation of the poetic imagination. In a work of distinguished merit Lewis Mumford presents the most searching and illuminating study of Herman Melville yet to have made its appearance.

Since 1914, especially during and immediately following the War, except for the development of fiction, the period has been most striking for the renaissance of interest in poetry; and in poetry, as in fiction, it has been the American

contribution which has been of peculiar interest. When the War broke in 1914, it found America riding on the crest of a wave of poetical experimentation which derived primarily from France, but which struck its roots deep into American soil, and drew from it sinews and strength. Free verse, as the new poetry was termed, and as it was expounded by Amy Lowell and practiced by Edgar Lee Masters, Carl Sandburg, Vachel Lindsay, and other of its serious exponents, is "a verse form based on cadence." It eliminates the recurrent rhythm of the line, and regards the group of lines as the unit of verse. It claims thereby to attain a flexibility and compass impossible to poetry in traditional meters. "Free verse," said Miss Lowell, "within its own law of cadence has no absolute rules; it would not be 'free' if it had." Nor has it regard for the restrictions imposed in the past on the content of poetry. It holds to a belief in "exteriority" or "objectivity," rejecting the traditional abstractions of poetry for the concrete and the scientifically accurate. And it strives to convey its meaning through a clear-cut imagery which, in the hands of an essential classicist like H. D. or an artist with the craftsmanship of Miss Lowell, produces poetry of genuine beauty and, in those of a Carl Sandburg or an Edgar Lee Masters, verse of rugged power; but free verse has not been consistently at ease in the house of its friends; it has been torn and tortured by the wilder experimenters like Kreymer and Pound, and it has been the excuse for the entrance into the lists of poetry of numbers of persons whose only qualification for its writing is the ability to shuffle off conventional forms. Nevertheless, it has been a vigorously fruitifying force in American literature, and though it is safe to say that a reaction has set in against it, there is no doubt that it has to its credit not only new valuable metrical achievements but the sudden outcropping of magazines of verse and poetical criticism that have both reflected and stimulated the growth of interest in poetry.

That the Imagist precision of diction and sharpness of impression are capable of attainment without sacrifice of traditional metrical forms, the work of Edwin Arlington Robinson, by many critics adjudged the greatest contemporary American poet, and of Robert Frost abundantly prove. Robinson's ironical and analytical intelligence, playing upon rustic characters and scenes, has produced poetry of highly realistic power in his portrayal of New England life. His method, however, which is indirect, and the frequently difficult texture of his thought, have prevented his works from capturing the popular fancy as did the grim realism of Edgar Lee Masters' epitaphs in the *Spoon River Anthology*. Robert Frost, on the other hand, who wraps the commonplaces of New England life in a kindly irony, has won popular favor as well as critical approval with *North of Boston*, *Mountain Interval*, and *West-Running Brook*. Amy Lowell herself, *vers librist*, imagist, and originator of what she termed polyphonic prose, showed herself competent to produce as admirable effects in conventional meters as in the new. Hers was a versatile talent, at its prime when cut off by death. Most of the American poets of standing, Conrad Aiken, Witter Bynner, William Rose Benét, Stephen Vincent Benét, Louis Untermeyer, to mention but a few, have written at times in free verse, though perhaps their best expression is found in the old forms. An interest-

ing experimenter of a different sort has been Vachel Lindsay, who first in the *Congo and Other Poems* and later in other interesting narrative poems, attempted to approximate his lyrics to a chant, employing various typographical devices to develop his effects.

Perhaps the most significant single contribution to American poetry of recent years has been Stephen Vincent Benét's *John Brown's Body*, a long narrative poem of the Civil War. In intrinsic interest of subject matter, in variety and flexibility of metrical forms, in high quality of imagination and the glow and range of its emotion, it takes rank as poetical work of unusual calibre. Here is a poem racy of the land from which it sprang, surprising in its virtuosity, stirring in its content. Together with another outstanding narrative poem of 1923, Edwin Arlington Robinson's *Tristram*, it makes that year a notable one in American poetry.

Some of the most distinguished poetical work since 1919 in America has been done by two women, Elinor Wylie, whose *Nets to Catch the Wind* and *Black Armour* preceded a succession of novels as striking in execution as her verse, and Edna St. Vincent Millay, whose *Second April*, *Renaissance*, *Harp Weaver*, and *Figs from Thistles* were followed by the lyrics for an opera composed by Deems Taylor. Miss Millay's strength lies in the abundant lyric beauty of her lines, in a sort of naïveté combined with passion, and in a technical proficiency that cloaks the cleverness of its performance in the case of its accomplishment. Mrs. Wylie's work, cut short by death on what seemed to be the threshold of its highest achievement, had a remarkable precision and chastity of outline, perfection of form and brilliance of execution, an emotion that, as one of her critics said, "burns with cold fire," and more depth of thought than Miss Millay displays. If in the last volume of poems issued before her death, *Trivial Breath*, there appeared to be a tendency toward more abstruseness than in her earlier books, the posthumous *Angels and Earthly Creatures* revealed hers as a talent of the first order.

No survey of recent American poetry would be complete that failed to take notice of Robinson Jeffers, whose *Roan Stallion* and *Cawdor* are regarded by some as works of genius and by others as beyond the bounds of legitimate poetry; nor should it omit mention of William Ellery Leonard's *Two Lives*, a sonnet sequence of indisputable poetical merit, conceived in agony of spirit and born in bitterness, or of the remarkable work of the child poet, Nathalia Crane, or the genuine gift of George Dillon, whose *Boy Against the Wind* marks him out as the most promising talent at the moment rising above the horizon.

The English poets have in the main been less influenced by the new verse forms than their American fellows, and have correspondingly less sought their subjects in the commonplaces of life. Imagism under the influence of the transplanted Americans, H. D., Ezra Pound, and T. S. Eliot, has been productive of interesting results and, in the case of H. D., of its most perfect expression; but in England, as in America, a reaction against it is under way.

English poetry more than American has sought its interest in narrative themes, having achieved in the work of John Masefield probably the most significant poetic output of the Anglo-Saxon world during the decade. The sea and

the English countryside have engaged Masefield's efforts, and an intense concern for man at his coarsest and most humble has lent an imaginative and moving quality to verse of often noble diction. Had he survived, Rupert Brooke, whose war sonnets gave evidence of growing beauty and power, might have written his name large in the annals of English poetry. The War, indeed, developed a notable output of verse, the most able of its exponents being James Elroy Flecker, "the last of the Parnassians," Robert Graves, Robert Nichols, Wilfred Owen, Siegfried Sassoon, Edmund Blunden, Isaac Rosenberg, and Richard Aldington.

In striking contrast to the bitter mood of the war period is the pastoral character of the work that men like Graves and Blunden have been doing. The lyric tradition of British poetry has further been carried on by Wilfred Wilson Gibson, John Drinkwater, Ralph Hodgson, and Walter de la Mare. Some of the most considerable contemporary poetical work has come from Humbert Wolfe, whose poems have excited an interest in England rarely equalled since Tennyson's day. Hardy, until his death, and Bridges and Kipling have continued to write and A. E. Housman in *Last Poems*, published 28 years after his previous volume of verse, *A Shropshire Lad*, has added a permanent contribution to the poetical literature of England. At the other extreme from these poets stand the Sitwells, the representatives of the most revolutionary poetical doctrine.

Interesting as has been the course of poetry during recent years, the developments in fiction and, more recently perhaps, in biography, have held the centre of the stage. Again in fiction, as in poetry, it is in America that the most striking evolution has taken place. The War found the English realists in command of the field and the post-war period has seen the continuance of their sway. Sex and, more latterly, psychology have supplanted the interest in social problems and injustices which were so dominantly the preoccupation of the closing period of the Victorian era and the opening years of the twentieth century; yet such writers as H. G. Wells and John Galsworthy still continue the sociological tradition. Wells, with his exuberant fancy, his perennial zeal for reform, his distinguished didacticism, and his daring in applying scientific doctrine to romance, has produced a series of novels which, like the plays of the no less ardent moralist, Bernard Shaw, are the vehicle for the promulgation of the author's social and spiritual gospel. *Mr. Britling Sees It Through*, the most successful war novel of the Anglo-Saxon world, no less than *Joan and Peter*, *The Secret Places of the Heart*, *William Ollisold*, *Meanwhile*, or *Mr. Blettsworth* on *Rampole Island*, revealed Mr. Wells himself. Mr. Galsworthy's preoccupation has remained predominantly social, even where, as in his war novel, *Saint's Progress*, he has become immersed in an emotional situation. In his *Forsyte Saga*, an analysis of the possessive instinct as exemplified in an English family, both his art and his social outlook have found expression in a series of novels that take rank with Arnold Bennett's studies of the English countryside as among the most notable contributions to Anglo-Saxon fiction of the century. From *Old Wives Tales* to *Riceyman's Steps*, despite several insignificant novels, Bennett's realism has translated the commonplace from dullness to dignity by lifting it to

the plane of the universal and thereby investing it with poignance lacking to such work, for instance, as the quiet annals of Archibald Marshall.

If social relationships have continued primarily to interest certain of the English novelists, it is the pastures of the soul that have captured the interest of more of them. J. D. Beresford, May Sinclair, Compton Mackenzie, Rebecca West, Frank Swinnerton, Dorothy Richardson, Sheila Kaye-Smith, H. G. Wells, and Aldous Huxley all have set themselves to its exploration with the result that the psychological novel, now frequently the psychoanalytical novel, has become the most conspicuous type in English fiction today. In such novels as May Sinclair's *Mr. Waddington of Wyck*, Rebecca West's *The Return of the Soldier*, Sheila Kaye-Smith's *Joanna Godden*, or H. G. Wells's *Secret Places of the Heart*, it differentiates itself sharply from the specifically sex novel as written by George Moore and in its extreme form exemplified by D. H. Lawrence, while in the work of an author such as Aldous Huxley, it becomes naturalism. Indeed, in such a work as his most recent novel, *Point Counter Point*, it becomes a philosophy of despair.

A remarkable example of the psychological novel is to be found in James Joyce's *Ulysses*, the hundreds of pages of which chronicle the stream of consciousness as it passes through one man's mind over a period of 24 hours. Various considered a work of genius and a dull abnormality, it is at least important in its influence on the development of expressionism. So, too, both puzzling and impressive is Wyndham Lewis's *Childermass* a cross between a novel, a satire, and a philosophical treatise.

The largest figure of contemporary English fiction was undoubtedly Joseph Conrad, whose novels of the sea and adventure draw their deepest interest not from their incident but from their splendid projection of the conflict of human emotions under the play of forces extraneous to themselves as well as inherent. It is a noble psychology which Conrad has outlined, moving, pregnant, and touched by a profound compassion, presented in rich and virile manner, and transfused by a high imagination. Work that stands out by reason of its singular subtlety is that of *The Garden Party* and *The Dove's Nest*, by Katherine Mansfield, whose delicate art was ripening into fuller achievement at the moment of her untimely death. In their ability to suggest the shifting play of mood and feeling, and their clear-sighted understanding of human reactions, her short stories gave promise of a genuinely high talent.

Despite the predominance of the interest in psychology, the purely romantic and the fantastic still hold their own in English fiction. In the case of Walter de la Mare, a gifted and richly endowed poetic fancy in combination with broad human sympathy have produced in *The Memoirs of a Midget* a work which, easily capable of grotesquerie, is in actuality a tender and convincing characterization. So, too, in David Garnett's *Lady into Fox* and *A Man in the Zoo*, the improbable and the fantastic are welded into harmony with a conceivable reality through a singularly unified conception and execution. Sylvia Townsend Warner in her *Lolly Willows* and Mr. Fortune's *Maggot* has used the fantastic as a vehicle for searching criticism; while Edith Olivier in the *Love Child* demonstrates the charm

of her delicate medium when adroitly used. In a *tour de force* of quite remarkable character, *Orlando*, Virginia Woolf uses the fantastic as a means of portraying the entrance into English literature of the feminine influence.

In Anne Douglas Sedgwick's *The Little French Girl*, Elizabeth's *Vera* and *Expiation*, Virginia Woolf's *Jacob's Room* and *Mrs. Dalloway*, Rose Macaulay's *Potterism* and *Dangerous Ages*, E. M. Delafeld's *The Way Things Are*, and G. B. Stern's *Matriarch*, it handled the stuff of contemporary life with a discernment that eschewed all sentimentality and that projected the social scene through the medium of a delicate satire. Like a breath of fresh air through the field of fiction came Margaret Kennedy's *The Constant Nymph*, one of the few novels really to strike an original note in literature, remarkable for the vigor and vivacity of its character drawing, the freshness of its situations, and the animation of its narrative. Miss Kennedy's *Red Sky at Morning* followed the earlier book and while not as striking a performance, nevertheless proved hers an art worth the watching. Like *The Constant Nymph*, the romances of Michael Arlen, *Those Charming People*, *The Green Hat*, and *Lily Christine*, stories and novels which depicted a society more or less prurient, created considerable of a sensation, as did also the *Dusty Answer* of Rosamund Lehmann. In *The Good Companions*, J. B. Priestley by returning to the ample scene and varied characters in which Dickens might have delighted produced a novel at once robust and interesting.

The War etched its mark deep into English fiction despite the fact that during its progress the novel, to a great extent, eschewed description of its horrors. The impress of battle was nevertheless upon it in the background and mood, if not in the incidents, of its narrative. Once the conflict was over, the inhibition to discussion of its various aspects was removed, and a succession of novels began to appear in which the agony of spirit that had so lately held the world in sway was translated into terms of romance. The more important part of this fiction grist was animated by an intense hatred of war and a resolute determination to strip it of what glamor might yet remain. In such trilogies as Ford Madox Ford's *No More Parades* and R. J. Mottram's *Spanish Farm*, realistic interpretation spoke with impressive accent, while in a work such as S. E. Montague's *Right off the Map*, the last to come from the pen of its author before his death, a profound and moving conviction and an eloquent pen combined through the medium of imaginative romance to point the manner in which nations are plunged into war and public opinion manipulated for its support.

Noteworthy as a large part of contemporary British fiction has been, and distinguished as is its craftsmanship, on the whole, the English novel has been flat in comparison with the American; for in America, forces that were stirring before the War, and that were brought to full growth in the heat of battle, resulted in the years immediately succeeding the struggle in a literature of revolt remarkable alike for its vigor and its vehemence. A generation after the influence of Zolaism had passed in France and England, the novel in America arrived at naturalism. It no longer acquiescently accepted the world, and especially its particular corner of it, at its own valuation, but it took to investigating it for itself scientifically; and great was its disillusion-

ment. What formerly it deemed fair it now discovered to be at bottom ugly and binding. The ease of American life it read as stultification, its uniformity as desperate monotony, and its complaisance as promise of disaster. It set itself to the high task of saving America from itself by joining battle with the dullness, the restrictions, the narrowness, of its life. Especially against the village did it turn the power of it attacks, and in its efforts to come to grips with realities, it introduced into American literature an acerbity completely foreign to its past. Sinclair Lewis's *Main Street*, *Babbitt*, and *Elmer Gantry*, Sherwood Anderson's *Winesburg, Ohio*, and *Poor White*, Zona Gale's *Miss Lulu Bett*, and Floyd Dell's *Moon-Golf* burned with a passion of indignation. They were tracts as much as novels—tracts against monotony, against convention, against rigid social codes. Their propagandism was their limitation as well as their strength.

Embittered by the same sudden awareness of the ugliness of life were the works of the writers of the more extreme expressionist school, Evelyn Brown, Carl Van Vechten, Waldo Frank, Ben Hecht, and a group of lesser novelists whose concentration on the abnormalities of life converts their fiction into pathology. No less a challenge to existing conditions was the attitude of the "younger generation" to whom Scott Fitzgerald's *This Side of Paradise* set a model for depicting the breakdown of decorum and convention, and Dos Passos's *Three Soldiers* established a norm for frank speaking.

Side by side with the naturalistic movement has continued a milder realistic stream, as evidenced in the work of Booth Tarkington, Edith Wharton, whose *Age of Innocence* with its acid delineation of a New York that had not yet acquired self-consciousness confirmed her position in the forefront of American novelists, Joseph Hergesheimer, Willa Cather, Edna Ferber, and Ellen Glasgow, whose delineation of American life displayed its nature without the social criticism implicit in the work of Sinclair Lewis, Dorothy Canfield, Fannie Hurst, Robert Herrick, Charles G. Norris, and Louis Bromfield, who have proved the virility and closeness to life of fiction in America. Playing on another plane is the unique talent of James Branch Cabell, whose theory that art should be based on a dream of life as it should be and not as it is, and that it must therefore tend "to become more or less of an allegory," has resulted in a richly tapestried series of romances of the Middle Ages and of present-day Virginia. Christopher Morley's realism and fancy produced *Where the Blue Begins* and *Thunder on the Left*, novels of distinction that veil a barbed criticism of life under a gay good humor. In Robert Nathan's *Jonah* and *The Bishop's Wife*, a mordant wit plays through succinct and tender sentiment. A very genuine gift for fiction showed itself in Elinor Wylie's *Jenifer Lorn*, a "sedate extravaganza" that sustained the manner and style of the eighteenth century with amazing success throughout its fantastic course and in her later novels, *The Venetian Glass Nephew*, *The Orphan Angel*, and *Mr. Hodge and Mr. Hazard*. An iridescent and highly charged style, an amazing erudition, and a fertile fancy gave distinction to Mrs. Wylie's work.

The South within the past decade has sprung to prominence in American literature, some of the most notable work of recent years having gone to the portrayal of its poor white folk

and its Negroes. Elizabeth Madox Roberts's *Time of Man*, Maristam Chapman's *Happy Mountain*, and T. S. Stribling's *Teefallow* have painted realistic yet sympathetic pictures of the mountain folk of Kentucky and Tennessee, while Du Bose Heywood's *Porgy* and Julia Peterkin's *Black April* and *Scarlet Sister Mary* are but outstanding examples of novels projecting the Southern Negro against the background of his native scene. The Negro, indeed, has come to the forefront of literature both as writer and subject, the march of interest sweeping on from the plantation Negro to the resident of Harlem, and holding a new focus of interest in American letters.

Despite the seriousness which has become the most marked characteristic of American fiction, and despite its absorption in the commonplace, the story of mystery, of adventure, the society novel, and the love story pure and simple continue to flourish. In both England and America, there has been an amazing output of mystery and detective tales, and in both countries the most wretched sensationalism attains commercial success.

Briefly to summarize Anglo-Saxon fiction, while it has produced no masterpiece, it has shown a sturdy development and a constantly closer approximation to the problems and interests of everyday life. In America, the trend to naturalism, and, on both sides of the Atlantic, the application of the findings of science and especially of the new psychology to the interpretation of life have been the outstanding developments of the period. While the British novelists have displayed a surer and more accomplished craftsmanship, the Americans have shown more ruggedness and intensity and a more bitter attack upon the strongholds of custom.

In drama, the notable fact has been the passing of the closet play, and the concern with the interests and problems of the day. Bernard Shaw has remained the outstanding satirist and moralist of his time, while Galsworthy has continued to use the stage as a means for protest against social abuses and injustices. Barrie, Lord Dunsany, and Lady Gregory have produced work of delightful whimsy and fancy, while Drinkwater with his *Abraham Lincoln*, Clemence Dane with her *Will Shakespeare*, and Bernard Shaw with *Saint Joan* have brought the historical play into favor. Shaw's amazing *tour de force*, *Back to Methuselah*, should have special mention. In the opinion of many critics, the most considerable dramatic work of the decade in America has been that of Eugene O'Neill whose work, *Strange Interlude*, has furnished the American stage with a powerful and morbid psychological study. For discussion of the drama in detail, see the article, THEATRE.

It is interesting to note that economic and social science has much advanced in public interest under the handling of such writers as Graham Wallas, R. H. Tawney, John Maynard Keynes, and other writers whose scientific accuracy is in no way impaired by their ability to write for the lay reader. Their work, however, falls without the scope of an article on literature.

In concluding a survey of the period begun by the War, attention must be drawn to the increase of interest in foreign literature which followed in the wake of the conflict. International-mindedness indeed is one of the most strongly marked trends of the time. The fiction

of Spain, Scandinavia, Holland, and Russia, as well as that of France and, lately, of Germany, has been translated and widely read. The criticism and art discussion of foreign lands has had broad currency, and the war memoirs and older biographies of the European nations have taken place beside similar chronicles in the English tongue. America, at least, has broadened its horizons in these years as never before in a century and in that fact, as well as in its sudden waking to self-realization, lies rich augury of future achievement.

No survey of contemporary literature in England and America would be encompassing if it omitted mention of the completion of the *Oxford English Dictionary* in the former country and of the issuance of the first volume of the *Dictionary of American Biography* in the latter. These works, while not in themselves literature in the usual interpretation of the term, are of such inestimable value to it as to demand recognition in any consideration of Anglo-Saxon letters.

No record of literary developments in America would be inclusive which failed to take account of the rise of the book clubs, such as the Book-of-the-Month Club, the Literary Guild, and the Book League of America. These organizations, purely commercial in origin, through enlisting the support of the leading critics of the country on their selecting committees, and through the influence exerted by their sending the chosen books to tens of thousands of subscribers, are exerting a constantly growing influence upon the taste of the public. Through a disagreement arising over the choice of a book by one of the clubs for June, 1929, one firm of publishers withdrew their coöperation from all book clubs and made public criticisms which resulted in a libel suit. Other publishers have followed this lead and have declined to submit manuscripts to the clubs in future, claiming that the clubs make profits only for themselves and cause losses to publishers and booksellers.

**LITERATURE, PRIMITIVE.** See ETHNOLOGY.

**LITHUANIA**, *lit'vā-ā-nā*. One of the new Succession States, created out of the former Russian Empire after the World War. The claims of the Lithuanian government included: the whole of the former Russian province of Kovno; the Province of Vilna, minus the districts of Diana and Vileika; a part of the Province of Grodno north of the Niemen River; the Province of Suvalki; part of the Province of Courland; the Memel district. According to 1914 figures, this territory had an area of 151,491 square kilometres (59,633 square miles) and 4,800,000 inhabitants. The eastern frontier was defined in the Russo-Lithuanian Treaty of July 12, 1920; the fixing of the northern frontier was provided for in a convention with Latvia on Sept. 28, 1920, by which the line was to be laid down by an English arbiter. To the south, however, no agreement was reached by 1929 (see below). Both Poland and Lithuania laid claim to part of the Province of Suvalki, the Province of Vilna, and Grodno Province. The actual area under the control of the Lithuanian government is only 31,652 square miles, and the population (1928 estimate) 286,368, of which about 86.7 per cent was rural. Ethnographical Lithuania, i.e., the territory included in the claims of the Government, is comprised of 73.5 per cent Lithuanians, 12 per cent Jews, 4.3 per cent Poles, 2.5 per cent White Russians, 1.5 per cent each Germans and Russians. Vilna, the capital, claimed by Lithuania,

had in 1914, a population of 214,600; other large towns are Kovno, the temporary seat of government (95,771), Grodno (61,600), Memel (38,454), Suvalki (31,600), Shavli (21,878). These towns are in both political and ethnographical Lithuania.

**Religion and Education.** In the most important provinces, Vilna, Kovno, and Suvalki, Roman Catholics form 85 per cent of the population; Jews, 7.7 per cent; Greek Orthodox, 2.7 per cent; Protestants, 4 per cent. In the Memel Territory, Protestants form 90 per cent and Roman Catholics, 5 per cent, of the population. In 1928 there were 2401 primary schools with 124,578 pupils and 159 secondary schools with 23,112 pupils. The University of Kovno was opened in 1922 and in 1928 had 258 professors and teachers and 3580 students.

**Industry and Trade.** The population is preponderantly rural in character. Of the total area, it is computed that 49 per cent is arable land, 26 per cent meadow and pasture land, 17 per cent forest, and the rest unproductive and waste. In 1927, 1,240,000 acres were under rye and 297,000 acres, under wheat. Principal crops in 1928 yielded, in metric tons: rye, 483,500; wheat, 198,000; barley, 160,300; oats, 401,900; potatoes, 1,220,000; peas, 64,400; flax fibre, 35,000; flaxseed, 34,960. In 1928 there were 611,400 horses, 1,199,300 cattle, 1,467,800 sheep, and 1,060,400 pigs. Poultry farming and bee keeping also are important. Forests cover 1,956,000 acres. By the treaty with Russia, Lithuania received 247,000 hectares of forests as compensation for damages. The leading internal question was the distribution of the large landed estates and by 1922 it was evident that expropriation was to be the plan adopted, without compensation. The agrarian law of February, 1922, provided for the expropriation of all holdings in excess of 80 hectares. The want of capital and the unsettled conditions of Central Europe made the reversion to an exclusive agricultural economy the only means for the maintenance of an ordered national life. The Government applied itself to this purpose, adopting the following measures: the teaching of the principles of scientific agriculture, the replenishment of the herds, the increasing of the arable area, in order to make possible greater export of agricultural products. These plans met with success, for by 1920-21, 10 per cent of the barley, rye, and wheat, half of the flax, and a good deal of the poultry were exported.

Immediately after the War, there was no revival of industry, the destruction caused by belligerent armies and the lack of raw materials, together with the dismantling of the larger plants, being insuperable obstacles in the way of a resumption of activities. What commercial intercourse there was partook of the nature of an exchange of agricultural products for finished manufactured articles. The trade for 1922, 1924, and 1928 was:

	1922	1924	1928
Exports	\$7,690,000	\$26,658,360	\$25,688,130
Imports	7,490,000	20,653,380	29,109,140

Chief exports are corn, cattle, hams, dairy products, flax, linseed, timber, hides, and wool. Chief imports are manufactured articles, agricultural machinery, fertilizers. In 1927, 53 per cent of the imports came from Germany; England supplied 7 per cent; the United States, 2



per cent. Principal countries of destination of exports were Germany, 51 per cent; England, 25 per cent; Latvia, 9 per cent.

**Communications.** There are about 25,461 miles of road in the country. There were 958 miles of railway in 1927. The most important lines are the Wirballen-Kovno-Koszedari line; the Janov-Shavli; and the Koszedari-Jewie. Also 364 miles of waterway are navigable for steamboats, and 1242 miles for smaller craft. The most important, the Niemen River, was internationalized by the Treaty of Versailles. See MEMEL.

**Finance.** In 1921 the revenues were 672,582,658 Lithuanian marks and the expenditures 885,725,375 marks. For 1922 the budget estimates balanced at 4,312,280,089 marks (roughly, \$7,000,000). In 1927 the actual receipts were \$26,036,000 and the actual expenditures, \$23,090,000. Estimated receipts and expenditures for 1928 balanced at \$26,322,000 and those for 1929 balanced at \$25,996,620. Up to 1923, the depressions of the German mark seriously affected the Lithuanian currency because much of the discounting business was done in Germany. On Oct. 1, 1922, a new currency law provided for the creation of a national currency based on the gold standard, with the *lit* (equal to one-tenth of the American gold dollar) as unit. Paper currency in circulation on Dec. 31, 1927, totaled 96,608,000 litas backed by gold reserve of 84,704,000 litas. The Lithuanian debt, on Dec. 31, 1927, was \$8,897,200, of which \$6,207,132 was due the United States government, \$1,846,350 to Lithuanians in the United States, and the rest was mainly internal.

**Government.** After working for two years, a constituent assembly finally promulgated a constitution on Aug. 1, 1922. This provided for the nationally elected Parliament, chosen every three years on the basis of universal suffrage and the proportional system, to make the laws, ratify treaties, approve the budget, and choose the state President. The ministry was to be selected by the President but was to be held responsible to the Diet. Cultural autonomy was provided for national minorities, viz., Jews, White Russians, and Poles, and religion and education were to be unhampered. The economic clauses provided for state regulation of lands and estates; state insurance for the aged, infirm, and unemployed; freedom of organization, and the right to strike.

**History.** In 1915 Russia's grip over Lithuania was loosened and replaced by German control. For the next three years, a German Army held the land, and impoverished it by exploiting its resources and scrapping its factories. Nevertheless, a Lithuanian National Council, the Taryba, was set up in 1917, and Lithuanian independence, as proclaimed on Feb. 16, 1918, was finally recognized by Germany on Mar. 23, 1918. German administration, however, continued for sometime longer, and Prince von Urach of Württemberg was nominated as the future King. While the outcome of the World War put an end to these intrigues, Bolshevik forces soon succeeded the German, and fighting was sporadic throughout the whole of 1919. Meanwhile, in January, 1919, a conference of Lithuanian patriots reestablished the Taryba which proceeded to organize a cabinet, and then, on April 4, made Antonas Smetona President of a provisional government. This government, however, was driven from Vilna, its capital, to Kovno, which in turn

was soon threatened by Bolshevik invaders. At the same time, the Bermond branch of Von der Goltz's army had to be beaten off, while Polish troops were continually being engaged in 1919-20.

By the spring of 1920, the situation had improved to such an extent that a constituent assembly could be convened, to reiterate the declaration of independence, begin work on a constitution, and open negotiations with Russia. The first ray of hope for the young nation appeared in July, 1920, when Russia came to terms with its succession state on a remarkably liberal basis. Lithuania was freed of its share of the Russian state debt; was compensated with 3,000,000 gold rubles; received 100,000 hectares of forest land; and had its ethnographic frontiers recognized, including the right to Vilna and Grodno.

A Constituent Assembly met on May 15, 1920, and on Aug. 1, 1922, it adopted a constitution which, as amended on May 26, 1928, provided for responsible government, with a Parliament or *Seimas* elected for five years on a universal suffrage basis, and a President elected for seven years. On Dec. 17, 1920, however, the Socialist government of President Grinius and Premier Slezevicius was overthrown by a military Nationalist *coup d'état*, and Parliament, in an emergency session, reelected former President Smetona for a three-year term. Prof. Augustinas Valdemaras became Premier.

Although Lithuania's northern boundary was fixed by agreement with Latvia in 1921, it took much longer to come to terms with Germany over the disposition of the Memel district, comprising about 650 square miles. By the Treaty of Versailles, the district north of the Memel River, including the port of Memel, was turned over to an Allied commission presumably in trust for Lithuania. In 1922 a movement for a free state, encouraged by Poland, was under way with the result that the French in charge refused to cede the district to Lithuania. Not until the Memel Convention of May 8, 1924, did the former Allies definitely settle the question by creating an autonomous Memel under Lithuanian sovereignty.

Even more difficult of settlement was a dispute with Poland over the Vilna territory. Vilna was occupied by a free-lance Polish Army in October, 1920, with the result that recourse had to be taken to the League of Nations. Though the Polish government disavowed the raid, the insurgent army could not be dislodged and it was necessary late in 1920 to dispatch an international force into Lithuania to end the conflict. Nothing was accomplished and it was not until November, 1921, that the rebel leader, Zeligowski, voluntarily withdrew. Throughout the years 1921-23, all attempts to adjudicate the Vilna controversy were fruitless. The plebiscite plan first broached by the League of Nations had to be abandoned in 1921 in favor of direct negotiations between Lithuania and Poland but, these proving unsuccessful, was adopted again. Finally on Jan. 8, 1922, an election was held in the Vilna district and Parliament thus chosen decided on February 20, by a vote of 96 to 6, for union with Poland. Lithuania refused to accept the result on the ground of irregularities and in this was upheld by the League of Nations Council; but on July 18, Vilna was incorporated into the Polish nation, and the League of Nations, accepting the *fait accompli*, appointed a commission to fix the boundary line. On Mar. 16, 1923, the Council of Ambassadors, in laying out the eastern and northern Polish boundaries included

the Vilna district, despite the still strenuous objections of the Lithuanian government. See LEAGUE OF NATIONS.

A technical state of war, with the frontiers closed, continued between the two countries for four more years, coming to a head on Oct. 4 and 5, 1927, when the Polish authorities, to avenge the alleged mistreatment of Poles in Lithuania, arrested 20 Lithuanians and closed 43 Lithuanian schools in Vilna. On October 19, Lithuania appealed to the League, claiming that Poland was acting in violation of the minority treaty that she had signed in 1920. At the December meeting of the League Council, both Valdemaras and Pilsudski were present. The Council unanimously adopted a resolution on December 10, ending the state of "peaceful war" which had endured for seven full years; but the Council said nothing about recognizing Poland's claims to Vilna, and so conditions remained unsettled. Indeed, Lithuania's amended constitution of 1928 referred to Vilna as the capital of the Republic, thus increasing the ill will in Poland.

The two countries next attempted to reach an agreement at Königsberg in the spring and summer of 1928, but Lithuania rejected a Polish nonaggression treaty, and in November, Poland rejected a Lithuanian proposal to put Vilna under an international administration. Finally, at the meeting of the League Assembly at Lugano in the fall of 1928, both parties agreed that the Vilna question should cease to be a political issue between them, though it remained as a "moral" issue.

In the winter of 1928-29, plots were discovered for the overthrow of Valdemaras because of his alleged subservience to Russia and Poland and because of a recently signed trade treaty with Germany. On May 6, 1929, an attempt was made to assassinate the Premier, with the result that martial law was established. In July, 1929, Lithuania, in a second note to the League of Nations, charged Poland with fomenting trouble in Lithuania. In September, Valdemaras was forced to resign and prospects for an agreement with Poland on Vilna appeared even more remote. Lithuania was admitted into the League of Nations on Sept. 21, 1921. She signed commercial treaties with Great Britain in May, 1922, and with Germany in June, 1923, and in 1928. On Sept. 28, 1926, a nonaggression pact was signed with Russia, and on Sept. 18, 1927, a treaty of friendship and conciliation was signed with Italy. Lithuania also adhered to the Kellogg Pact. See VILNA DISTRICT.

**LITTLE, ARTHUR W.** (1873- ). An American printer and publisher, born in New York City. He was educated in private schools and in 1891 joined the company of his father, J. J. Little & Co., printers. He served in the State Guard in New York from 1891 to 1912. In the World War, he served in France with the 369th United States Infantry, colored, as regimental adjutant and major, and took part in all actions with Gouraud's 4th Army. He was wounded in action Sept. 12, 1918. He was made a Chevalier of the Legion of Honor and received the Croix de Guerre with two palms and two stars.

**LITTLE ENTENTE.** The series of agreements and treaties entered into by Czechoslovakia, Yugoslavia, Rumania, and on occasions Poland, for the protection of their mutual interests, was commonly called the Little Entente. It was ostensibly an alliance for de-

fensive purposes in case of an unprovoked attack from Hungary, but in reality it embodied an all-embracing policy aiming at the maintenance of the *status quo* on the European continent resulting from the Peace Treaties of Versailles, St. Germain, and the Trianon. In her desire for security, France became at the Peace Conference the sponsor of the most extreme claims of the Czechs, the Poles, the Serbs, and the Rumanians, in order to make the new states formed by these peoples as strong as possible and to create out of them a bloc as France's ally against Germany. Hence, the new states were given contiguous frontiers and direct railroad communications and practically no regard was shown for the wishes and the economic necessities of the inhabitants of the border districts. The Succession States, on the other hand, when they found themselves so generously endowed, were quite ready to fall in line. The result of the settlement was a patchwork of new states saddled with alien minorities counting many millions and faced with political unrest and economic chaos. This being the situation, security for France and the Succession States lay only in the closest coöperation toward a continuation and consolidation of the existing status by military effort.

The most essential prerequisite for the success of this policy was the conclusion of a definite alliance between the Succession States based on community of interests and the coöperation of this compact group with the French policy. On Aug. 13, 1920, a convention was signed between Czechoslovakia and Yugoslavia which provided for mutual help in case of unprovoked attack. When the efficacy of this alliance for the maintenance of the *status quo* had been sufficiently demonstrated on the occasion of the prevention of the restoration of Emperor Charles to the throne of Hungary, Rumania joined on Apr. 23, 1921. The immediate concern of this tripartite defensive alliance, or Little Entente, was the consolidation of its position, which was successfully carried out during the following years. Its intervention frustrated, in September, 1921, a second Hapsburg Putsch in Hungary, and it coöperated with France in blocking the union of Austria with Germany. By means of a coercive policy, Austria and Hungary were subsequently compelled to submit in every respect to the wishes of the Little Entente and to seek a closer accord with it.

The Italians were not without justification in sensing in the formation of the Little Entente a veiled threat against their interests in central Europe and the Adriatic. Although some of the difficulties between the Little Entente and Italy were subsequently ironed out by the Treaty of Rapallo between Italy and Yugoslavia and by the Fiume settlement on Jan. 27, 1924, it remained an open question how far these and other pacts had actually removed the deep-rooted friction between the Little Entente and Italy. Absolute accord seemed impossible so long as the Little Entente remained the guardian of French interests. Poland never joined the Little Entente officially. She did, however, on all important matters coöperate with the latter to an extent which made her an unofficial fourth member of the alliance. Czechoslovakia, in particular, was active in maintaining and strengthening the Little Entente in order to stabilize conditions in the Danube area and a number of conferences were held in 1927 at

Jochymov and Geneva. The solidarity of the Little Entente was even more manifest in 1928 when a Little Entente Inter-Parliamentary Association was established. See CZECHOSLOVAKIA; FRANCE; ITALY; JUGOSLAVIA; POLAND; and RUMANIA.

**LITTLETON, MARTIN WILLIE** (1872- ). An American lawyer, born in Tennessee. He was self-educated and after studying law was admitted to the bar in 1891. For several years, he practiced in Dallas, Tex., and then removed to New York, where he at once took a prominent place in legal circles. Becoming active in politics, he was assistant district attorney of Kings County from 1900 to 1904, and president of Brooklyn Borough in 1904-05. He served as delegate from New York to the Democratic National Convention in 1904 and presented the name of Alton B. Parker for President. From 1911 to 1913, he was a member of Congress for New York.

**LITTMANN, HILMAN, MAX** (1862- ). A German architect who was born in Chemnitz and studied there and in Dresden. He traveled in Italy and after 1888 was a resident of Munich. He was the designer of the new Schack Gallery, the Hofbrauhaus, the new Psychiatric Clinic, and the Prince Regent Theatre at Munich, the Court Theatre at Stuttgart, and the Schiller Theatre at Charlottenburg. He was Privy Councilor and professor, and received silver medals in Paris and St. Louis.

**LITVINOV, MAXIM MAXIMOVICH** (1875- ). A Russian Communist, Assistant People's Commissar for Foreign Affairs since 1921. He joined the Russian Social-Democratic Party in 1893 and lived many years in exile, mainly in Great Britain. In 1918 he was Soviet representative in Great Britain, in 1920 he was appointed Minister to Estonia, and in 1922 he was Russian delegate to the Genoa Conference. He presided over the Moscow Disarmament Conference of 1923 and in 1928 was head of the Soviet delegation sent to the Preparatory Disarmament Conference.

**LIVERPOOL.** The principal seaport of England for the Atlantic trade and one of the greatest trading centres in the world. The population at the census of 1921 was 802,940; in 1927 it was estimated to be 872,900. The municipal area is 24,102 acres (about 33 square miles). The net tonnage of British and foreign ships engaged in ocean trade arriving in the port during 1926 was 14,033,955 and of those departing, 13,297,474. In 1927 there were 87 docks and basins and 22 dry docks with an area of 1925 acres and a linear quayside on both sides of the Mersey of 39 miles. In that year on July 19, the new Gladstone Dock was opened by King George. This dock has a total water area of 58 acres, including the Gladstone Dry Dock which was completed in 1913 and which it encloses. In 1928 an 80-foot river entrance lock was constructed at the Alfred Dock, Birkenhead, so as to provide increased facilities for ships of deep draught engaged in trade with the Near East. The lock provides a depth of 48 feet 4 inches at high-water ordinary spring tides and of 42 feet 9 inches at high-water neap tides, thus enabling the largest ships afloat to go in and out on every tide of the year. A new landing stage also has been constructed, consisting of a floating structure 2534 feet long supported on 200 iron pontoons and connected with the shore by bridges. The total cost of these new works was approximately £8,000,000.

Overlooking the harbor are three new large office buildings: the Royal Liver Building, a skyscraper containing the offices of the Royal Liver Friendly Society with two towers, 295 feet high, crowned with figures of the liver bird; the Cunard Building; and the Dock Board Offices with a dome 230 feet high. In front of the Cunard Building is a bronze equestrian statue of Edward VII, by Sir W. Goscombe John, which was unveiled in 1921. The Liverpool subway crosses under the Mersey by tunnel and traverses the territory on the south side of the river. It was originally constructed for steam railroad service, but was subsequently electrified. The Mersey Road Tunnel has been under construction since 1925. When completed, it will be the largest vehicular tunnel in the world—44 feet in diameter and 2 miles long—with room for four lines of traffic. The volume of water which can be drawn from Lake Vyrnwy, the city's main reservoir, has been increased by construction of the Aber Tunnel.

On July 19, 1924, the first portion of the Liverpool (Church of England) Cathedral, consisting of the chancel, east transepts, and chapter house, was consecrated. The cathedral, situated on St. James's Mount, was begun in 1904 and, when completed, will be the largest ecclesiastical structure in England. The architect is Sir Giles Gilbert Scott, whose designs were accepted when he was only 21 years of age and who is responsible also for almost every detail of the interior. In composition, the building is classical and symmetrical, the conditions of the site calling for a structure which would be sufficiently solid in mass and strong in outline to contrast with the great rectangular blocks of office buildings in the business section. The style is Gothic, though freely interpreted. When finished, the cathedral will have a total area of 100,000 square feet with an external length of 619 feet.

**LIVE STOCK.** Conditions in the live-stock industry have fluctuated considerably since 1914. Prior to the World War, there was an increasing tendency toward a reduction in the per-capita consumption and production of meat in the United States and in the world in general. The War, however, acted as a great stimulus to meat production in the United States. At first, the effects of rising feed prices tended to start a temporary liquidation of animals in 1915 and 1916, but as the world's shortage of meat became evident, prices of meat animals increased. As early as 1913, the dwindling per-capita production of meat also stimulated production in the more remote and thinly populated areas of the world, where previous evidence had indicated that beef production might thrive. Consequently, the United States packers began to establish plants in South America. In the United States, the calculated per-capita consumption of meats, including lard, amounted to 168 pounds in 1907, dropping off gradually to 132 pounds in 1917, and increasing again to 165 pounds in 1924, since which time there has been a gradual decrease to 153 pounds per year. The annual per-capita consumption of beef was rather stable at 65 to 70 pounds from 1917 to 1927. Pork consumption rose from 50 pounds in 1917 to 75 pounds in 1923.

A peak of meat prices was reached in 1919 with practically all classes of animals, and live-stock producers were enjoying a more prosperous position probably than ever before, although a severe drought in the Southwest, ending in 1918 and followed by one in the Northwest, tended to

handicap feeders and breeders alike in those sections. Following the prosperous conditions of 1919, there was an irregular decline in both pork and beef prices during 1920. The situation became critical for beef and hog producers, but the outlook for the sheep breeders was even more demoralizing. Wool dropped from \$0.72 on the range to a condition where no market at all existed. The prices of live stock continued to fall through 1921, reaching low levels at the end of the year. Although the European countries were still suffering from the loss of many of their animals during the War, they were unable, due to poor exchange rates and a lack of credit facilities, to purchase any great amounts of meat. At the end of 1921, however, conditions began to show more promise, and some meat products, especially pork, were exported to western Europe.

Conditions in 1922 were somewhat better, especially for the sheep raiser, and the passage of the McCumber-Fordney Tariff Bill placed a heavy duty on all mutton, lamb, and wool imported. During 1923 a peculiar situation existed which apparently was unexpected, resulting in an unprecedented slaughtering of hogs and a reduction of hog prices to low levels of less than \$7 per 100 pounds in December. There was a steady annual reduction in the number of beef cattle in the United States from 1922 to 1928, with a steady increase in the price of beef. A general complaint about the high price and lack of quality in beef culminated in the latter part of 1927 in a recommendation by certain Eastern hotels and restaurants that their patrons eat meats other than beef. Swine production fluctuates more rapidly than beef production, so that the number of hogs on farms, following the record slaughtering of 1923, reached a low point in 1925. A stimulation in the prices again resulted in a heavy production in 1927, with a lowered foreign demand. The numbers of sheep have increased each year since 1922. The accompanying table indicates the annual fluctuations in the numbers of animals slaughtered under Federal inspection in the United States from 1913 to 1928.

during the War finally resulted in the passage of the Packers and Stockyards Act by Congress, which became a law in August, 1921. This act provided for the supervision of public stockyards, live-stock market agencies, and dealers in live stock and live-stock products, to prevent misleading or illegitimate practices, and to encourage fair competition.

**International Conditions.** There were many changes in the live-stock situation in the different countries of the world following the War. The beef industry developed rapidly in Argentina, New Zealand, Australia, and South Africa. New Zealand and Australia were also the world's largest exporters of lamb and mutton. The development in these countries was rendered possible by the rapid improvements in methods of refrigeration and cold storage of meat products and by the opening of large slaughtering plants. Much of the Australian and New Zealand products was shipped to England and Europe, though considerable New Zealand lamb, coming to the United States prior to and after the War, met with much favor. Since 1922 and the passage of the McCumber-Fordney Tariff Bill, imports of lamb and mutton have been less than 5,000,000 pounds, though there were more than 25,000,000 pounds imported in 1921. The extreme depression in the beef-cattle market which began in 1921 and continued through 1923 was keenly felt in several of the beef-exporting countries.

In Argentina, where cattle raising for export is the main industry, the situation became so acute in 1923 that the cattle men organized and were instrumental in having a law passed on October 15 to set a minimum price for beef in the export trade. The fallacy of such procedure was evident when the law began to operate and the British and American packing companies in Argentina refused to buy cattle. For the relief of similar situations in Australia and South Africa, the respective governments offered bounties on export beef of  $\frac{1}{4}$ d. (\$.005) and  $\frac{1}{2}$ d. (\$.01) per pound. Bounties also were offered for live cattle exported. Conditions were much improved in 1927 and 1928.

MEAT ANIMALS SLAUGHTERED ANNUALLY IN THE UNITED STATES UNDER FEDERAL INSPECTION AND PER-CAPITA CONSUMPTION OF MEAT

Year	Cattle	Calves	Sheep	Goats	Swine	Horses	Per capita consumption of meats and lard
	Number	Number	Number	Number	Number	Number	Number
1913	7,155,839	2,098,484	14,724,465	56,556	32,287,538	....	147.6
1914	6,724,117	1,814,904	14,058,834	121,827	33,289,705	....	145.0
1915	6,964,502	1,735,902	12,009,089	165,533	36,247,858	....	137.5
1916	7,404,288	2,048,022	11,985,926	180,356	40,482,799	....	141.1
1917	9,299,489	2,679,745	11,343,418	174,649	40,210,847	....	131.6
1918	10,938,287	3,323,077	8,769,498	149,503	35,440,247	....	143.2
1919	11,241,991	3,674,227	11,268,370	125,660	44,398,389	....	142.2
1920	9,709,819	4,227,558	12,374,827	77,270	38,981,914	1,089	150.0
1921	8,179,572	3,896,207	12,452,435	20,277	37,702,866	1,335	144.6
1922	7,871,457	2,924,255	11,968,484	17,758	39,416,439	1,898	153.0
1923	9,029,536	4,337,789	11,403,703	25,129	48,000,069	1,459	164.3
1924	9,188,652	4,667,948	11,605,001	31,279	54,416,481	4,699	165.1
1925	9,773,883	5,185,310	12,203,159	26,570	48,459,608	11,909	166.9
1926	10,098,121	5,311,774	12,354,225	42,774	40,442,730	39,668	156.5
1927	10,049,589	5,080,062	12,894,016	30,437	42,050,443	42,635	153.5
1928	8,467,308	4,679,922	13,488,171	18,819	49,795,408	127,066	152.7

Conditions in pork production were complicated in 1926 by the heaviest outbreak of hog cholera that had occurred in many years. Outbreaks of foot-and-mouth disease in 1924 and 1925 seriously threatened the live-stock industry in certain sections of the Far West. The supervision of the packers and stockyard agencies

Concurrent with development of the beef-cattle and sheep industries in the Southern Hemisphere, the European countries were rebuilding their live-stock industries which were largely demoralized during the War. To complicate somewhat the European situation in 1926, Great Britain prohibited imports of fresh meats

from continental Europe, due to foot-and-mouth disease. This made necessary the curing of about 92,000,000 pounds of fresh and frozen pork ordinarily shipped from the Netherlands alone.

Canadian stock raisers were somewhat affected by the United States tariff and by the raising of the embargo on Canadian cattle by Great Britain in 1923. Most significant in the meat export trade of the United States was the reaction to the European demand for meat during the War. In 1916 and 1919, the exports of both beef and pork reached the largest amounts in history, although the United States has long been the leading exporter of pork. In 1914 less than 400,000,000 pounds of pork products, exclusive of lard, were exported, but this amount was more than doubled in 1915 and continued to increase to nearly 1,750,000,000 pounds in 1918. From a similar figure in 1919, the pork exports of the United States, exclusive of lard, declined irregularly until they were less than 300,000,000 pounds in 1928.

The major part of the pork exported consisted of bacon, which was over 1,000,000,000 pounds in both 1918 and 1919. Over 50 per cent of the bacon and about 75 per cent of the ham and shoulder exports were to the United Kingdom. The lard exports were close to 500,000,000 pounds up to 1919, when they were 750,000,000. This amount was steadily maintained through 1922, but in 1923 and 1924 over 1,000,000,000 pounds were exported, since which time the lard exports have been maintained rather constantly at about 700,000,000 pounds. The exportation of lard to Germany, which was entirely stopped from 1915 to 1918, was resumed in 1919, with gradual increases in the amount exported each year to nearly 377,000,000 pounds in 1923, followed by a decline to approximately 180,000,000 pounds in 1928. There was a remarkable increase in the fresh beef exports of the United States from less than 7,000,000 pounds in 1913 to 514,000,000 in 1918, with a gradual decline to 2,000,000 pounds in 1928.

**Trends in Research.** Experimental inquiry indicated a more complete realization of the importance of fundamental research. Notable advances were made in the physiology of nutrition and knowledge of qualities which influence the value of feeding stuffs. A better understanding of the importance of vitamins, minerals, and the different kinds of proteins in the rations for live stock tended to explain why certain feeds and feed combinations produced unsatisfactory growth or gains. The relation of sunlight and ultra-violet radiation to mineral metabolism also was brought out during this period. Undoubtedly, one of the most extensive coöperative projects ever undertaken was initiated in 1925 for a study of the factors influencing the quality and palatability of meat. This study increased in popular, as well as scientific, interest and in 1928 there were more than 20 of the State agricultural experiment stations and the U. S. Department of Agriculture engaged in studies of the effect of feeding, breeding, age, and sex on the quality of the meat of the various classes of animals.

The attainment of results in breeding experiments with the live stock of more economic importance is necessarily a slow process, and the expense of such investigations is often prohibitive. Much progress in breeding has been made through the use of the smaller experi-

mental animals such as the rat and the guinea pig, with sufficient comparisons with larger animals to make it evident that the same fundamental principles of inheritance are operative. Fundamental investigations of much practical value on the effect of inbreeding in rats and inbreeding and crossbreeding in guinea pigs were carried on at the Wistar Institute and the U. S. Department of Agriculture, respectively. Both studies indicated that inbreeding tends to increase the percentage of homozygosity of the stock. The latter study dealing with the effect on fertility and vigor showed that such conditions seem to depend mainly on dominant factors and that crossbreeding brings together a greater variety of dominant factors and thus results in increased vigor. In less extensive experiments with swine and poultry, these results were largely confirmed.

Interesting studies of sex determination in animals have indicated that sex is not only due to differences in the sex-determining power of chromosomes, but that the sex also may be modified by other factors which tend toward the production of intersexuality in certain cases. R. Goldschmidt in Germany, working with gipsy moths, has carried this analogy further than other investigators, although recent results with goats, pigs, chickens, and pigeons in Scotland and the United States have partially, at least, corroborated his results. Theoretical studies of growth, senescence, and production in dairy cattle and hens indicated that the curves of milk production, egg production, and growth and senescence in dairy cattle and senescence in fowls tend to follow the course of a monomolecular chemical reaction. It is thus concluded that these physiological operations are limited by chemical reactions.

Events of outstanding interest were the Second and Third World's Poultry Congresses held at Barcelona, Spain, and Ottawa, Canada, in 1924 and 1927, which were attended by representatives from about 40 foreign countries. Problems of poultry marketing, nutrition, breeding, and diseases were discussed from the practical and scientific points of view. See VETERINARY MEDICINE.

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and H. E. Botsford, *Practical Poultry Management* (New York and London, 1925); *Proceedings of Second and Third World's Poultry Congress* (1924-27). See also DAIRYING.

**LIVONIA.** See BALTIC PROVINCES.

**LLEWELLYN, SIR WILLIAM** (1863- ). A British painter. He studied at South Kensington under Sir Edward J. Poynter and in Paris under Cormon, Lefebvre, and Ferrier. He became an associate of the Royal Academy in 1912 and an Academician in 1920. He has painted many portraits, including several of Queen Mary besides the State Portrait of her made in 1910. Field Marshal Sir George White, Sir Francis Hopwood, and Lord Colville of Culross were other subjects. He was knighted in 1918 and was made President of the Royal Academy in 1928.

**LOYD GEORGE, Rt. Hon. David** (1863- ). A British statesman and reformer (see VOL. XIV). At the outbreak of the World War, as Chancellor of the Exchequer, he took measures which enabled British credit to withstand the immediate needs brought about by the beginning of the struggle. Early in 1914, he was appointed Minister of Munitions, in which office he displayed ceaseless energy and remarkable ability for organization. Following the death of Earl Kitchener, in 1916, he was appointed Secretary of State for War. He proposed the limiting of the War cabinet to a smaller membership, but failing to bring this about, he resigned, and as he was supported by the Unionist leaders, Mr. Asquith, the Prime Minister, retired, and Lloyd George became Premier and First Lord of the Treasury. From 1917 to the conclusion of peace, he was practically dictator of government policies. Following the Armistice, he called for a general election, and on being returned to power by an immense majority, he was one of the leading figures at the Peace Conference. In 1920 he introduced the Home Rule Bill, and largely through his efforts the Irish Free State was established. His aggressive support of Greece in 1922, and the success of the Turkish Armies in that year, brought about his defeat, together with that of the Coalition cabinet. He was, however, returned to Parliament and was leader of the Liberal policy in the House of Commons until 1923 and again after 1925. He visited the United States in 1923. After September, 1925, he talked continually, and with detriment to the Liberal Party funds, for his new land policy. Lloyd George proposed that the Government buy out the landlords, and act as the necessary capitalist in financing the farmers. In 1927 Lloyd George's offer to put the old Coalition funds under his control at the unconditional disposal of the Liberal Party was accepted, but not without dissension. Later in the year, the party was reunited under Sir Herbert Samuel, who worked in accord with Lloyd George. The latter wrote *The Great Crusade; Extracts from Speeches Delivered during the War*, arranged by F. L. Stevenson (1918); *Where are We Going?* (1923); *Slings and Arrows* (1929). Consult *Mr. Lloyd George*, by E. T. Raymond (1922); *David Lloyd George, War Minister*, by J. S. Mills (1924); *Lloyd George*, by H. Spender (1924), and *David Lloyd George*, by J. Hugh Edwards (1929). See GREAT BRITAIN, under *History*.

**LOYD OF DOLOBRAN, GEORGE AMBROSE** LLOYD, FIRST BARON (1879- ). A British administrator, who was born at Dolobran, Mont-

gomeryshire, Wales, and educated at Eton and Cambridge. He became a student of Oriental politics, traveling widely in Burma, India, Little Tibet, the Himalayas, Egypt, Morocco, and Asia Minor. Having served as attaché to the British Embassy at Constantinople, in 1908 he acted as special commissioner for Great Britain on British trade in Turkey, Mesopotamia, and on the Persian Gulf. During the World War, he served in Egypt, Gallipoli, Mesopotamia, and the Hedjaz. He won the D.S.O. in 1917. From 1910 to 1918, he was a Member of Parliament (Unionist) for West Staffordshire. He was Governor of Bombay from 1918 to 1923, was elected to Parliament for Eastbourne in 1924, and in 1925 was appointed High Commissioner for Egypt and the Sudan—a post that he retained until 1929. He resigned at the request of the Secretary of State for Foreign Affairs in the MacDonald ministry.

**LOANS, INTERNAL AND EXTERNAL.** See FINANCE AND BANKING.

**LOCARNO CONFERENCE.** See GERMANY, under HISTORY; LEAGUE OF NATIONS.

**LOCKE, WILLIAM JOHN** (1863- ). An English novelist (see VOL. XIV). His later works include: *Far Away Stories* (1916); *The Wonderful Year* (1917); *The Rough Road* (1918); *The House of Baltazar* (1920); *The Mountebank* (1921); *The Tale of Triona* (1922); *The Kingdom of Theophilus* (1927); *Joshua's Vision* (1928); *Perella* (1928).

**LODER, B. C. J.** (1849- ). A Dutch jurist, who practiced law from 1873 to 1908, when he became a justice of the Supreme Court of the Netherlands, serving until 1921. He was president of the Confederation of Scandinavian States, Switzerland, and Holland in 1920 and, in 1922-24, of the Permanent Court of International Justice, of which he is still a member. He was a founder of the International Maritime Commission (1896), and of the International Intermediary Institute at The Hague (1918).

**LODGE, HENRY CABOT** (1850-1924). An American legislator and historical writer (see VOL. XIV). He was reelected to the Senate in 1918. In the same year, he served as chairman of the Committee on Resolutions at the Republican National Convention in Chicago. He was the leader in the Senate in opposition to the Versailles Treaty and the Covenant of the League of Nations in the form in which they were presented for ratification. He proposed reservations and amendments which President Wilson refused to accept (see UNITED STATES). He served as temporary and permanent chairman of the Republican National Convention of 1920, and in the same year was chairman of the United States Pilgrim Tercentenary Commission. In the Sixty-seventh and Sixty-eighth Congresses, he was chairman of the Committee on Foreign Relations and was the Republican leader of the Senate. He was appointed, by President Harding, delegate and special ambassador to the Conference on the Limitation of Armaments, 1921-22. In 1922, he was again reelected to the Senate, though by a greatly reduced majority. His opposition to several of the important policies advocated by President Coolidge in 1924 caused him to be severely criticized. His later books include *Democracy of the Constitution and other Essays* (1915); *War Addresses* (1917).

**LODGE, SIR OLIVER (JOSEPH)** (1851- ). A British physicist, philosopher, and student of psychical phenomena (see VOL. XIV). In 1919

he was made Albert Medalist of the Royal Society of Arts as a pioneer in wireless telegraphy. In the same year, he resigned his position as principal of the University of Birmingham. In 1926 he was the Halley Stewart Trust lecturer, his talks being published in the next year as *Science and Human Progress*. His publications immediately after the World War were devoted exclusively to psychical research. *Raymond* (1916) purports to reveal communications between Sir Oliver and his son who was killed in the War. *Christopher* (1919) is a study in human personality on the spiritistic hypothesis. Besides contributing a number of articles to journals on psychical phenomena, he wrote *Making of Man* (1924); *Atoms and Rays* (1924); *Either and Reality* (1925); *Relativity* (1925); *Electrical Precipitation* (1925); *Talks about Wireless* (1925); *Evolution and Creation* (1927); *Modern Scientific Ideas* (1927); *The Natural History of a Savant* (translated from Charles Richet, 1927); *Science and Human Progress* (1928).

LOEB, JACQUES (1859-1924). An American physiologist and experimental biologist (see Vol. XIV). His later major works were *The Organism as a Whole, from the Physicochemical Viewpoint* (1916); *Forced Movements, Tropisms and Animal Conduct* (1918); and *Proteins and the Theory of Colloidal Behavior* (1922).

LOEB CLASSICAL LIBRARY. See PHR-  
 LOLOGY, CLASSICAL.

LOENING, GROVER C. (1888- ). An American aeronautical engineer born in Bremen, Germany, and educated in New York. He is best known for his invention of the first flying boat, the monoplane flying boat, and the first American short-hull flying boat. He introduced steel construction in the Sturtevant biplane (1916) and the next year began the designing and development of the Loening monoplane and seaplane. In 1922 the Collier Trophy was awarded him for the Loening air-yacht. Among his books are *Monoplanes and Biplanes* (1917); *Military Aeroplanes* (9th ed., 1918-18); *Revelation of the Monoplane* and many papers and articles.

LOESCH, FRANK JOSEPH (1852- ). An American lawyer. He was born at Buffalo, N. Y. and received the degree of LL.B. from the Union College of Law, Northwestern University (Chicago) in 1874. After admission to the bar, he practiced at Chicago, specializing in estate and corporation law. Since 1886 he has been counsel at Chicago for the Pennsylvania Railroad. From 1898 to 1902, he was a member of the Chicago Board of Education. In connection with the first direct primary (1908), he served as special State's attorney to investigate and prosecute frauds. He was vice president of the Chicago Crime Commission in 1928. In May, 1929, President Hoover appointed him as one of the ten members of the National Law Enforcement Commission.

LOGUE, MICHAEL (1840-1924). A Roman Catholic cardinal, born in County Donegal, Ireland. He was consecrated Bishop of Raphoe in 1879 and in 1887 was made Roman Catholic Primate of all Ireland. He was created Roman Catholic Archbishop of Armagh in 1888 and Cardinal in 1893. He took an active part in bringing about settlement between the opposing parties in Ireland prior to the formation of the Irish Free State, and his influence was constantly exerted against violence and bloodshed.

LONDON. The capital of England, centre of the government and commerce of the British Empire, and largest city in the world. The population at the census of 1921 was 7,476,168; in 1927 it was estimated to be 7,796,353. The area comprises 700 square miles and consists of the City of London and 28 metropolitan boroughs. The growth of London has never been more rapid than since the World War. Old landmarks, such as Charing Cross Station and Little Britain and Bartholomew Close, are disappearing before demands for space to relieve traffic congestion or for the erection of new buildings and extensions to existing buildings. Typical of this new era in London's architecture are Bush House, an international sales building erected in 1920, and the new Lloyds' Building. Other important buildings which have been erected since the World War are Australia House, India House, the Canadian Government House, and the House of the British Medical Association.

The relief of traffic congestion is one of London's most pressing problems. One step in meeting this is the construction of new bridges and the widening of existing ones. In 1929 a new bridge was erected across the Thames to take the place of the Lambeth Suspension Bridge built in 1862. Plans call for the construction of a new bridge to take the place of the Charing Cross Railway Bridge and the Hungerford Foot Bridge, which together adorn the finest bridge site in London. This bridge, a two-story structure, will tap Waterloo Road on the south side of Thames, discharging part of its traffic into the Strand on the north side and carrying another part overhead across the Strand to be discharged farther north at the foot of Charing Cross Road. Waterloo Bridge is to be widened so as to accommodate four lines of traffic. Another scheme to relieve traffic has been the construction of a series of circular roads. The most important of these is the North Circular Road which rounds the north of London from the docks at Woolwich on the lower Thames to Kew Bridge on the upper Thames. The most difficult engineering feat in constructing this road was the building of a half-mile viaduct over the Lea marshes. This viaduct, which was completed in January, 1927, at a cost of £120,000, carries a 40-ft. roadway with 10-ft. sidewalks on either side. The embankment on the south side of the Thames is to be developed and a boulevard constructed as fine as the one on the north side. This embankment will begin at Westminster Bridge, where the Albert Embankment ends, and will run round the great bulge on the south side of the river to Blackfriars Bridge.

London's housing problem is receiving a happy solution through the establishment of garden cities, such as Letchworth, Welwyn, and Hampstead, and the adoption of slum-clearance schemes. Since 1919 the London County Council has undertaken and partly completed schemes for the clearance of 92 acres of slums which will displace about 25,000 persons, rehousing 18,189 of them within the same area and 5089 elsewhere. The cost of clearance and roadwork is estimated at £1,145,200 and the cost of rehousing at £2,000,000. One of the most important features of the council's work is the development of suburban estates. At Becontree, 6000 houses are being erected for the accommodation of 25,000 to 30,000 persons. On the Bellingham estate, 2090 working-class houses and flats, with

accommodation for 10,000 persons, have been built. In 1923 the London County Council and the Minister of Health reached an agreement which is considered the greatest definite legislative advance ever made by any public authority toward slum clearance in London. Under it, the Government contracted to pay pound for pound with the Council to a total annual loss of £100,000, the programme to continue for 60 years.

London retains its title of first commercial port in the world. During 1928 the net tonnage of ships entered and cleared was 52,500,000, an increase of more than 3,000,000 tons over the preceding year. In 1926 the net tonnage of ships engaged in foreign trade was 21,110,101 for arrivals and 19,832,850 for departures. In 1929 the port improvements at Tilbury and Millwall, begun in 1926, were completed at a cost of more than £5,000,000. The new Tilbury Dry Dock, with a width of 110 feet at the entrance and a depth over the sill of 36 feet 6 inches at high tide, is the largest dock in the port of London and is surpassed in size only by the Gladstone Dry Dock at Liverpool. Although at present only 750 feet long internally, this dock can be lengthened in the future to 1000 feet. At the Millwall docks, the last of the three communication passages linking the West Indian dock system and the Millwall docks was completed in 1928. A new entrance lock, forming the main approach to all the docks in the Isle of Dogs, has been constructed at Blackwall. Other improvements include the construction of a floating passenger landing stage and the new riverside station at Tilbury and the construction of a new entrance to the Southwest India Dock, which is 550 feet long, 80 feet wide, and 35 feet deep at high water.

Along with the improvement of the port of London has been the development of its airport. The Croydon Airdrome is gradually being transformed into one of the finest and best-equipped airports in the world. The principal features are the large main building housing the Air Ministry's administrative offices and the offices of various British and foreign companies using the airdrome; the two large hangars, each covering an area of 300 feet by 150 feet and accommodating 35 of the largest passenger planes; and the new hotel which has been constructed for the use of air passengers. The airdrome, comprising landing field and buildings, occupies an area of nearly 400 acres.

London's rapid-transit system has played an important part in the development of the metropolis. On Dec. 10, 1928, the new underground station at Piccadilly Circus was opened. The platforms at three different levels have been rearranged, and a new booking-hall has been provided on the street level. The cost of the work, which was started in 1925, was £500,000. The original station was opened in 1906 and was designed to serve both the Bakerloo and Piccadilly tubes. Its annual traffic then was approximately 1,500,000 passengers. By 1928 this figure had reached 25,000,000, owing to the development of the Piccadilly Circus district as a theatrical centre.

In 1928 a subway for carrying mail between Whitechapel in the eastern part of the city and Paddington in the western part was inaugurated. The tunnel is 50 to 90 feet below the street and has a total length of six and one-half miles. Each station has spiral chutes for carrying the

mail down and elevators for carrying it up. The automatic cars are each capable of carrying 1120 pounds. A saving of about £40,000 annually is expected through the use of this system, which ultimately will form a network throughout the city.

Another important transit development has been the electrification of all suburban railways south of the Thames. In 1925 a new electric railway from Baker Street to Watford was constructed, and in 1926 the extensions of the City and South London Railway from Clapham to Morden and of the London Electric Railway from Charing Cross to Kennington were opened to traffic. In 1925 the metropolitan water system was considerably augmented by the opening of the Queen Mary Reservoir at Littleton. It is the largest entirely artificial reservoir of its kind and contains, when full, 6,750,000,000 gallons of water. The water surface at top water level is 723 acres.

Since 1925 St. Paul's Cathedral has been under restoration. The work is expected to be completed in June, 1930. The vast weight of the cathedral—60,000 tons or more—rests upon eight massive piers. On account of the construction of water mains, sewers, etc., the strata of sand and clay upon which the cathedral is built have shifted and the massive piers wrenched away so that the dome was no longer level. The work of restoration has consisted of grouting the main piers that support the dome and placing a chain of steel around the dome as an added precaution, thus adding, it is estimated, 200 or 300 years to the life of the structure. For this work, a sum of about £400,000 was raised by contributions from all parts of the Empire.

In 1920 a replica of Augustus Saint-Gaudens's statue of Lincoln in Lincoln Park, Chicago, was erected in the grassy enclosure of the Houses of Parliament. Among the many war memorials which have been erected in London, the most impressive is the Cenotaph, commemorating in dignified simplicity the Glorious Dead of the World War. The monument, designed by Sir Edwin Lutyens, was first erected in plaster at a saluting point for the Allied Victory March of Nov. 11, 1919, and was rebuilt in stone and unveiled by the King on Nov. 11, 1920. The tomb of Britain's Unknown Warrior is in Westminster Abbey. The body was brought from Flanders and interred in the Abbey on Nov. 11, 1920, as representative of all the nameless British dead of the World War.

**LONDON, TREATY OF.** See FIUME-ADRIATIC CONTROVERSY; ITALY; REPARATIONS; TYROL, GERMAN SOUTH; WORLD WAR, DIPLOMACY OF.

**LONDON CONFERENCES.** See REPARATIONS.

**LONE SCOUTS OF AMERICA.** An organization for boys, incorporated in Washington in 1915, and merged with the Boy Scouts of America as a separate division in 1924. Since its organization, there had been 563,000 members, about 90,000 of whom were active at the end of 1924. With only two adult leaders, the Lone Scouts had developed a national organization. In addition to its official magazine, the *Lone Scout*, discontinued after the merger, there were 40 amateur publications. The Lone Scouts of America now provides an opportunity for boys to whom troops are inaccessible to join the Boy Scouts organization. Headquarters are in New York City. See BOY SCOUTS.

**LONGFELLOW, ALEXANDER WADSWORTH** (1854- ). An American architect, born at Portland, Me. He was graduated from Harvard in 1886 and studied architecture at the Massachusetts Institute of Technology and at the École des Beaux Arts. He began the practice of his profession in Pittsburgh and Boston in 1887, forming the firm of Longfellow, Alden & Harlow. This firm designed the Carnegie Library at Pittsburgh and the City Hall at Cambridge. In 1895 he formed a partnership with his brother, R. K. Longfellow. He designed Phillips Brooks House and other buildings for Harvard University and several buildings for Radcliffe College. He was the designer of the original Boston elevated railway stations.

**LONGLEY, HARRY SHERMAN** (1868- ). An American Protestant Episcopal bishop, born at Cohoes, N. Y. He was graduated from St. Stephen's College in 1891 and from the General Theological Seminary in 1894, was ordained in 1895 and served as rector in churches in Massachusetts, New York, and Illinois. In 1912 he was consecrated suffragan Bishop of Iowa. He was elected coadjutor bishop in 1917, and in 1920 became presiding bishop of the Province of the Northwest.

**LONGMAN, (MARY) EVELYN BEATRICE** (Mrs. Nathaniel Horton Batchelder) (1874- ). An American sculptor (see Vol. XIV). Among her later awards were the French Gold Medal from the Art Institute of Chicago, 1920; the Widener Gold Medal from the Pennsylvania Academy of Fine Arts, 1921; the Watrous Gold Medal from the National Academy of Design, 1923; the Charles Noel Flagg Prize, Connecticut Academy, 1925, and the Shaw Memorial Prize, National Academy of Design, 1926. She became a National Academician in 1919.

**LONG RANGE GUNS.** See ARTILLERY.

**LONGWORTH, NICHOLAS** (1869- ). An American public official, born at Cincinnati, Ohio, and educated at Harvard. He was admitted to the bar in 1894, and served in the State Legislature of Ohio from 1899 to 1903. During 1903-13 he was a member of the United States Congress and was reelected for the 64th-71st Congresses (1915-31) as representative from the First Ohio District. He was floor leader of the House of Representatives, 1923-25, and speaker of the 69th and 70th Congresses (1925-29). In 1906 he married Alice, daughter of President Theodore Roosevelt.

**LONSDALE, FREDERICK** (1881- ). A British dramatic author, who, besides being a librettist and adaptor of stories for musical comedies, wrote many successful plays of his own, most of them light comedies. His plays, with the dates of production, include *The Best People*; *Aren't We All?* (1923); *The Fake* (1924); *The Street Singer* (1924); *Spring Cleaning* (1925); *The Last of Mrs. Cheyne* (1926); *On Approval* (1927); *The High Road* (1927).

**LOOS, ADOLF** (1870- ). An Austrian architect who has successfully attempted to introduce a modern style of architecture in Vienna. He was educated at the State Industrial School at Brunn, and the Technical High School at Dresden, and spent three years in America and some eight years in Paris.

**LOPEZ PINILLOS, JOSÉ** (1875-1922). See under SPANISH LITERATURE.

**LORD, HERBERT MAYHEW** (1859- ). An American army officer and budget director. He was born at Rockland, Me., and graduated at

Colby College, Waterville, Me. (1884). He engaged in newspaper work and served as clerk of the ways and means committee of the House of Representatives at Washington until 1898. He was appointed major and paymaster of volunteers in the Spanish-American War, and captain, U. S. Army, in 1901. He was promoted through the grades to brigadier general (1919). In 1918 he was made assistant to General Goethals, with the title of director of finance, and became chief of finance, U. S. Army, 1920. During the World War, he served as army liberty loan officer. In 1922 he was retired from the Army and succeeded Gen. Charles G. Dawes as director of the budget. He resigned that office in May, 1929.

**LORD, ROBERT HOWARD** (1885- ). An American educator, born at Plano, Ill. He was graduated from Harvard University in 1906 and took post-graduate courses in Austria, Germany, and Russia. He was successively instructor, assistant, and associate professor of modern European history at Harvard, and in 1924 became full professor of the same subject. He resigned in 1927 following his conversion to Roman Catholicism and in April, 1929, was ordained a priest of the Roman Church. In 1918-19 he was Harvard technical expert on Polish affairs with the American Commission to Negotiate Peace in Paris, and a member of the American Inter-Allied Commission to Poland (1919). He wrote *The Second Partition of Poland* (1915) and, with Prof. C. H. Haskins, *Some Problems of the Peace Conference* (1920).

**LORENTZ, LÖRÉNTS, HENDRIK ANTOON** (1853-1928). A Dutch physicist (see Vol. XIV). He was awarded the Copley Medal of the British Royal Society in 1918, was the second chairman of the League of Nations Committee of Intellectual Coöperation, and in 1923 lectured in English universities as an exchange professor of the Anglo-Batavian Society, receiving the honorary degree of D.Sc. from Cambridge.

**LORENZ, ADOLF** (1854- ). An Austrian orthopedic surgeon (see Vol. XIV) who has received unusual publicity in the United States and elsewhere, because identified with a successful method of bloodless treatment for a special deformity—congenital dislocation of the hip. At the close of the World War, Lorenz divided his practice between the United States and his home city of Vienna. His free orthopedic clinics were held in some of the large cities of the United States.

**LORENZEN, ERNEST GUSTAV** (1876- ). A German-American lawyer and educator, born at Russee-Kiel, Germany. He came to the United States in 1892 and studied law at Cornell University, taking post-graduate studies in France and Germany. After practicing law in New York City from 1901 to 1903, he was appointed professor of law at the University of Maine. In 1904 he became professor of law and in 1910, dean of the Law School at George Washington University. From 1911 to 1914, he was professor of law at the University of Wisconsin, and from 1914 to 1917, at the University of Minnesota. In the latter year, he was appointed to a similar chair at Yale. He was the author of several books on legal subjects and contributed articles to American and European reviews.

**LOS ANGELES, lós äng'há-läs.** The largest city of California. The population rose from 319,198 in 1910 to 576,673 in 1920 and to 1,427,7

480 in 1929, according to local estimate. The area was 441.23 square miles. In May, 1924, a new city charter was adopted, the outstanding features of which were the enlisting of citizen service on a great number of administrative boards, with boards of expert administrators attached, and the intrusting of large administrative powers to responsible executives, subject to these citizen boards. The following departments, each administered by a board of five salaried commissioners, were created: building and safety; city planning; efficiency and personnel; finance; harbor; health and sanitation; parks and playgrounds; county affairs; police and fire; public utilities; public welfare; public works; street opening and widening; traffic and lighting; tunnels, bridges, and viaducts; water and power. The mayor, the city attorney, controller, and members of the council and of the board of education were to be elected by popular vote. Provision also was made for the creation of boroughs within the city, whereby any annexed section, not a part of the original central city, of 4000 acres or 40,000 population, might become a borough by action of the city council and a vote of the residents of the proposed borough territory.

In 1928 the new Los Angeles City Hall was dedicated. The building consisting of a large lower portion, rectangular in plan, with a high, central tower for the municipal offices, was erected upon a site planned as a Civic Centre at a cost of approximately \$7,000,000. The Hall of Justice, built by Los Angeles County, is another important new building that houses a number of the county government offices, the sheriff's department, jail, etc. In 1926 the new central public library was opened. Several viaducts and bridges over the Los Angeles River, carrying the city's main thoroughfares to the east, have been built since 1920. A major traffic plan also was adopted for relieving the congestion of these thoroughfares, a special feature being the construction (under a \$350,000 bond issue) of 44 pedestrian subways at the most dangerous crossings and near school buildings. In 1925 the first subway was opened from the junction of First and Glendale Boulevard through the hills to Hill Street between Fourth and Fifth streets, where the Subway Terminal Building was erected. This subway provides easy access to the business section for Hollywood, Glendale, Burbank, and other suburbs in the San Fernando Valley.

During 1922 and 1923, \$6,900,000 was spent on harbor improvements, and Los Angeles became a regular port of call for 61 different freight and passenger lines and five tank lines. In 1929 the main channel was widened and a second breakwater was built from the Long Beach end of the harbor so as to meet the needs of 157 lines that served the port regularly. The cost of these improvements was estimated at \$18,000,000, part of which was to be met by the Federal government. Imports increased in value from \$1,942,647 in 1910 to \$9,897,336 in 1920 and to \$40,388,142 in 1927, while exports showed an even more remarkable climb from \$135,911 in 1910 to \$18,606,121 in 1920 and to \$110,991,047 in 1927. In 1924 bonds were voted by the city for the following purposes: \$34,600,000 for school sites, buildings, and equipment; \$8,000,000 for waterworks; \$1,600,000 for police stations and signal system; \$1,000,000 for bridges; \$600,000 for incinerators; and \$400,000 for fire boats. In addition, \$35,000,000 was voted by the

county for flood control. The total cost of all public works constructed during 1927 was \$27,537,920; of this amount \$17,019,688 was spent for street improvements, \$4,445,707 for sewers, \$5,052,137 for storm drains, \$74,590 for pedestrian subways, and \$945,796 for bridges.

In 1927 Los Angeles ranked eleventh among the manufacturing cities of the United States. Approximately 66,500 persons were employed in its 2961 industrial establishments and received \$99,746,854 in wages; the value of products manufactured was \$610,166,093. The manufacture of aircraft is an important industry which has followed in the wake of Los Angeles' development as an air centre. In 1928 planes, motors, and accessories to the value of \$4,000,000 were produced in Los Angeles County. The city of Los Angeles has a Department of Aviation, the director of which has jurisdiction over the three airports located at the harbor, at Griffith Park, and at Mines Field. Through the financing of the Daniel Guggenheim Fund for the Promotion of Aeronautics, a model air line was established between Los Angeles and San Francisco in May, 1928. Its primary purpose was to prove that an air line, carrying only passengers and express, could be financially successful and could maintain reliable schedules. Another use of the Guggenheim Fund was the establishment of a weather service, consisting of 39 reporting stations, between the two cities. In 1929 Los Angeles County had 27 schools of aviation with a student enrollment of approximately 1500. It is estimated that 30 per cent of the total air-mail traffic of the United States flies in and out of Los Angeles County's 50 airports. Bank clearings in Los Angeles increased from \$1,145,167,110 in 1914 to \$7,024,888,783 in 1923 and to \$10,825,705,000 in 1928; building permits increased in value from \$21,684,100 in 1910 to \$60,023,600 in 1920 and to \$123,027,139 in 1927. The assessed valuation of property in 1928 was \$1,723,154,405; the net debt was \$203,403,399.

**LOTTI.** *lô'tê* PIERRE (JULIEN VIAUD) (1850-1923). A French novelist (see VOL. XIV). In 1914 he reëntered the service of his country, being appointed to the General Staff of the Armies of the East as inspector of the defense against airplanes. Resulting from his war experiences were numerous articles, published in the following collections: *La hygiène enragée* (1916); *Quelques aspects du verlige mondial* (1917); *L'horreur allemande* (1918); *La mort de notre chère France en Orient* (1920). During these latter years, he also published several autobiographical works, continuations of his earlier ones: *Prime jeunesse* (1919); *Suprêmes visions d'Orient* (1922); and *Un jeune officier pauvre* (1923). The last two works were revised and published by his son Samuel. Consult *Pierre Loti*; the *Romanesque of a Great Writer*, by Edmund B. D'Auvergne (1926).

**LOUCHEUR,** Louis (1872- ). A French industrialist and politician, born at Roubaix, and educated at the lycée of Lille and the École Polytechnique in Paris. Graduating as an engineer, he was interested in industrial enterprises, and did not come to the fore until the World War, when he became Under-Secretary of State for war industries (December, 1916), and for coal supply (March, 1917), Minister of Armaments (September, 1917), and for industrial reconstruction after the Armistice. He tried unsuccessfully to bring French and German industrialists to-



gether on a programme of mutual interest, was active in drafting the economic sections of the Versailles Treaty of 1919, and in that year he entered the Chambre as a member of the radical left, becoming one of its leaders. He again became Minister for Reconstruction of the devastated regions, under Briand (January, 1921–January, 1922), signing the Wiesbaden agreement. He was Minister of Trade in Poincaré's cabinet of March to June, 1924, represented France at the League of Nations Assembly (since 1924), was Minister of Finance in Briand's cabinet (November, 1925–March, 1926), Minister of Trade in Herriot's three-day cabinet in July, 1926, and represented France at the World Economic Conference held in 1927. He was proprietor of *Le Petit Journal*, a Parisian daily paper.

**LOUDERBACK, GEORGE DAVIS (1874–)**. An American geologist, born at San Francisco, Calif. He studied at the University of California, receiving the Ph.D. degree in 1900. He became professor of geology at the University of Nevada in 1903. In 1906 he returned to California, where after 1917 he was professor of geology and in 1920–22, dean of the college of letters and science. During 1914–15 he was consulting engineer of the Standard Oil Geological Expedition to China and in 1918–19 he held consulting relations with the United States Bureau of Mines and the United States Geological Survey. During the World War, he was a member of the Pacific coast committee on geology of the National Research Council. Dr. Loudersback made a specialty of the basin range structure and west coast stratigraphy and was the discoverer of several new minerals, including benitoite. He was president of the Seismological Society of America in 1914.

**LOUIS III, LEOPOLD JOSEF MARIA ALOYS ALFRED**, last KING OF BAVARIA (1845–1921). (See VOL. XIV.) He was forced to abdicate in November, 1918, when the people of Bavaria inaugurated the Bavarian Free State.

**LOUISIANA** The thirtieth State in size (48,506 square miles) and the twenty-second in population; capital, Baton Rouge. The population increased from 1,656,388 in 1910 to 1,798,509 in 1920, a gain of 8.6 per cent; estimated population, 1928, 1,950,000. The white population increased from 941,086 (1910) to 1,096,611 (1920); the native white from 889,304 to 1,051,740. Foreign-born whites decreased in number from 51,782 to 44,871; Negroes, from 713,874 in 1910 to 700,257 in 1920. Both urban and rural populations increased: the former from 496,516 to 628,163; the latter from 1,159,872 to 1,170,346. The growth of the principal cities was as follows: New Orleans (q.v.), 339,075 (1910), 387,219 (1920); Shreveport, 28,015 to 43,874; Baton Rouge, 14,897 to 21,782.

**Agriculture.** Agricultural conditions in Louisiana have been affected, as in the case of the other Southern States, by the ravages of the boll weevil, which first became serious about 1905. The effect is apparent in the following comparison of the acreage and production of cotton for various years during the period. In 1904, the acreage was 1,745,865 and the production 1,089,526 bales; in 1908, 1,550,000 and 470,136; in 1921, 1,168,000 and 279,000; in 1922, 1,185,000 and 357,000; in 1928 (estimated), 1,985,000 and 685,000. In addition to the devastations of the boll weevil, army worms in many sections of the State have been prevalent in some seasons. See **BOLL WEEVIL** and **COTTON**.

The number of farms decreased from 135,463 in 1920 to 132,450 in 1925. The acreage of land in farms in 1920 was 10,019,822; but it fell by 11.8 per cent. The improved land in farms was 5,626,226 acres in 1920. Crop land acreage (1925) was 4,279,528. The total value of farm property rose from \$301,220,988 in 1910 to \$589,826,679 in 1920, but declined to \$385,910,844 in 1925; the average value per farm was \$2499 in 1910; \$4354 in 1920; and \$2914 in 1925. In interpreting these values, the inflation of the currency incident to the War is to be taken into consideration. The total percentage of land used for agricultural purposes decreased from 35.9 in 1910 to 34.5 in 1920, and 30.4 in 1925. Of the total number of farms in 1925, 52,386 were operated by owners; 503, by managers; 79,561, by tenants. The comparative figures for 1910 are 52,989,950, and 66,607. White farmers numbered 73,404 in 1920; 72,937 in 1925; the native white farmers (1920), 71,081; Negro farmers, 62,036. The 1.9 per cent decrease in Negro population, 1910–20, quite seriously affected the farm-labor situation. The farms reported as under mortgage numbered 11,783 in 1920; 14,424 in 1925. The number of dairy cows was 217,690 in 1920; 97,791 in 1925; "beef" cows, 316,518 in 1920 and 297,024 in 1925. The number of swine declined from 911,600 in 1920 to 517,551 in 1925. Mules numbered 180,115 in 1920; 173,458 in 1925; sheep, 129,816 in 1920 and 108,581 in 1925. The estimated production of the chief farm crops in 1928 was follows: Corn, 21,114,000 bushels; oats, 1,078,000; potatoes, 2,870,000; sweet potatoes, 6,600,000; rice, 18,392,000 bushels; peanuts, 8,100,000 pounds. Comparative figures for 1913 are corn, 41,800,000 bushels; oats, 990,000; rice, 11,760,000; potatoes, 1,750,000; hay, 240,000 tons; and cotton, 444,000 bales. Louisiana is the most important cane-sugar-producing State. In 1928 the crop of cane used for sugar making totaled 2,243,880 tons, grown on 138,000 acres, and produced 330,781,795 pounds of sugar and 14,800,927 gallons of molasses.

**Mining.** Louisiana is an important producer of minerals, especially of petroleum, sulphur, and natural gas. There is no metal mining in the State. The petroleum industry is most important. Its progress during the period from 1914 on is indicated by the following figures: In 1914 there were produced 14,309,435 barrels, valued at \$12,886,897; 1915, 18,191,539, \$10,804,653; 1917, 11,392,201, \$17,224,602; 1918, 16,042,600, \$27,535,060; 1920, 35,714,000, \$112,600,000; 1921, 27,103,000, \$42,469,000; 1926, 23,201,000, \$38,200,000; 1927, 21,061,000, \$38,700,000 (estimated). The increased production in the years 1920–22 indicated the discovery and development of new oil fields. In the production of sulphur, Louisiana has led the list of States. Production figures are 1914, 374,470 tons; 1918, 918,700; 1920, 37,635; 1921, 795,980; and 1922, 1,146,860. The chief sulphur mine shut down in 1924, but continued shipments from a large stock. The production of natural gas also is of great importance. In 1915, 25,540,392 M. cubic feet were produced; 1918, 36,094,132; 1920, 58,274,000; 1926, 157,423,000. The output of natural-gas gasoline has increased steadily, rising from 2,113,159 gallons in 1916 to 10,809,629 gallons in 1920; 15,340,374 gallons in 1921; and 46,200,000 gallons in 1927. In addition to the minerals mentioned above, the State produces clay products, salt, and sand and gravel.

The total value of the mineral products in 1926 was \$62,203,543, as compared with \$139,745,725 in 1920; \$38,851,509 in 1919, \$54,769,225 in 1918, and \$21,890,025 in 1914.

**Manufactures.** While Louisiana is not one of the chief manufacturing States, its industrial progress, in the past 20 years, has been great. Six cities in the State had in 1920 populations of more than 10,000 each. These in 1919 contained 27.6 per cent of the total population and produced 32 per cent of the total value of the manufactured products. In 1909, there were in the State 2516 manufacturing establishments; 2617 in 1919, 1742 in 1925, and 1025 in 1927. Persons engaged in manufactories numbered 86,563, 112,523, 88,058, and 82,415. Capital invested amounted to \$221,816,398 (1909), and \$462,209,056 (1919). The value of the products in 1909 amounted to \$233,948,638; in 1919, \$676,189,770; in 1925, to \$710,050,000; and in 1927, \$638,361,215. The increase in value of the products about 1919 was due largely to changes in industrial conditions brought about by the War, and therefore cannot be properly used to measure the growth of manufactures during the census period of 1914-19; but the increase shown in the number of wage earners clearly indicates a growth in the State's manufacturing activities. A leading industry in importance in point of value of products is the refining of sugar. This, in 1909, amounted to \$63,775,000; in 1914, to \$57,948,000, and in 1919, to \$141,843,000. The manufacture of lumber and timber products is important; in 1909 such products were valued at \$62,838,000; in 1919, at \$130,521,000; and in 1925, at \$121,896,611. Since 1914, when there were 21 refineries, the refining of petroleum has become one of the great industries of the State. The value of the product in 1919 was \$75,023,726. The manufacture of cottonseed oil and cake has diminished in point of value: in 1909, \$13,085,000; in 1919, \$57,162,000; in 1925, \$7,762,000. The chief manufacturing cities are New Orleans (q.v.), Shreveport, and Lake Charles. In 1909 there were in New Orleans 848 manufacturing establishments, with a product valued at \$78,794,000; 873 in 1919, with a product of \$182,799,000; and in 1925 the manufactured product was \$155,106,000.

**Education.** Educational progress from 1914 on has been well maintained in Louisiana. The Legislature of 1914 passed, among other important measures, a compulsory-education law affecting all cities of over 25,000 inhabitants. In 1916, measures were passed authorizing the acceptance of the terms and provisions of the Smith-Hughes Bill providing for vocational education. The State colony and training school for feeble-minded was created in 1918. In 1920 parish school boards were authorized to create school districts at any time. The Legislature of 1922 passed an act providing for the State Board of Education and parish school boards, defining their powers and providing for the administration and supervision of the public schools of the State; the board to include 11 members, three appointed by the governor, and eight elected for terms of eight years. In the same year, an inclusive compulsory-attendance measure was passed, providing for the attendance in school of every child in the State between the ages of 7 and 14; and the Legislature also provided for the promotion of vocational rehabilitation. In 1914 the total enrollment in the schools was 288,972, including both white

and colored pupils; in 1925-26, the number enrolled had increased to 395,007; of whom 264,129 were white and 130,878 were colored; the total enrollment of elementary colored pupils was 126,993; of secondary colored pupils, 3885. The expenditure for day public schools in 1925-26 was: current, \$15,548,612; outlays for new buildings, etc., \$4,192,556. The percentage of illiteracy in the State decreased from 31.1 in 1910 to 24.9 in 1920: among the native whites, from 16.8 per cent to 13.5; among the foreign-born whites, from 23.2 to 22.6; among the colored, from 52.2 to 43.8 per cent.

**Finance.** State expenditures in the year ending Dec. 31, 1927, as reported by the U. S. Department of Commerce were: for maintenance and operation of departments, \$19,663,230 (of which \$5,420,558 was for local education); for conducting public-service enterprises, \$58,832; for interest on debt, \$723,400; for permanent improvements, \$8,981,125; total, \$29,426,135 (of which \$10,812,821 was for highways, \$3,469,605 being for maintenance and \$7,343,216 for construction). Revenues were \$28,126,095; of this, property and special taxes formed 35.9 per cent, departmental earnings, 4.4 per cent; and trade licenses, severance tax, and gasoline tax, 41.5 per cent. Assessed property valuation was \$1,724,954,042; State taxation thereon, \$9,918,486. Net State debt on Dec. 31, 1927, was \$16,459,287.

**Legislation.** In 1916 a State Board of Education was created. In 1918 the Legislature ratified a State prohibition amendment and the Federal Woman-suffrage Amendment. Cities were authorized to adopt the commission form of government when their population exceeded 5000. Laws were passed regulating the sale of narcotics, and the child-labor laws also were amended. A law requiring instruction in the common schools to be conducted only in the English language was enacted. The Legislature of 1924 enacted a measure prohibiting the wearing of masks by members of secret societies. The Legislature of 1926 provided for revision of the criminal code.

**Political and Other Events.** Louisiana was one of the States in which, after the War, the Ku Klux Klan was active; repeated attempts to control and regulate members of this body were made by the governor and other State authorities. In 1914, though Democrats were successful in other Congressional districts, one elected a Progressive candidate. In 1915 over \$4,500,000 was expended in New Orleans to rid the city of rats in order to prevent the reappearance of the bubonic plague. In 1916, R. G. Pleasant, Democratic candidate, was elected governor. In the presidential voting in this year, President Wilson received 79,875 votes; Charles E. Hughes, 6466. In 1920 E. S. Broussard, Democratic candidate, was elected Senator; for President, J. M. Cox received 87,354 votes; W. G. Harding, 38,538. On Dec. 21, 1922, the bodies of two men were found in a lake in Morehouse Parish. It was alleged that these men had been flogged by members of the Ku Klux Klan and their bodies thrown into the lake. Owing to lack of evidence, the grand jury then failed to bring indictments against them; but on Apr. 18, 1923, the district attorney of Morehouse Parish lodged 30 informations against prominent citizens for the alleged participation in the murder. Four members of the Ku Klux Klan were found guilty of "carrying firearms on the premises of another." In

May, 1924, J. M. Fuqua was inaugurated governor. The vote for President in 1924 was: Davis, 93,218; Coolidge, 24,670. Governor Fuqua died in office Oct. 11, 1927, and Lieut. Gov. O. H. Simpson succeeded. The presidential vote of 1928 was: Smith, 164,655; Hoover, 51,160; Huey P. Long was elected governor. The criminal law of the State was recodified in 1928 and a measure to prepare the way for a \$30,000,000 bond issue was voted upon favorably.

**LOUISVILLE.** The largest city of Kentucky and the second most populous south of the Ohio and the Potomac rivers. The population rose from 223,928 in 1910 to 329,400 in 1928, by estimate of the U. S. Bureau of Census. The incorporated area of the city was increased to 25,101 acres by the annexation of Highland Park and Oakdale in 1922. The cities of New Albany, Ind., and Jeffersonville, Ind., with an additional population of 45,000 are immediately across the Ohio River. In point of value of manufactures, the city is shown by the U. S. Census of Manufactures to be the most important industrial centre in the South. The value of its manufactured products increased from \$200,566,000 in 1919 to \$263,693,000 in 1925, and in 1927 the Louisville Industrial Foundation estimated the value of its industrial output at \$364,257,894. Louisville is supplied with transportation service by nine trunk-line railways, eight interurban electric railways, and the Ohio River. In connection with the Ohio River development by the U. S. Government, a dam, with a lock for navigation and affording a maximum head of 37 feet, was completed in 1927. This also contained a power station of the Louisville Gas & Electric Co. In 1929 a new highway bridge over the Ohio River was completed. Bank clearings increased from \$1,153,048,000 in 1920 to \$1,936,031,000 in 1928 and the assessed valuation of property from \$207,000,000 in 1914 to \$600,000,000 in 1928, according to local estimate. The net debt in 1927 was \$21,171,000.

**LOUVAIN LIBRARY.** A famous institution connected with the University of Louvain in Belgium. During the German invasion of 1914, the university together with its library, which contained 120,000 volumes and 250 incunabula, was ruthlessly destroyed. When Cardinal Mercier, its head, visited the United States in 1919, he was asked of what particular aid Americans could be in the work of Belgian reconstruction; he suggested that the schools, colleges, and universities of the younger and larger country should join in the restoration or rather rebuilding of this monument of the smaller and older land. Under the terms of the Versailles Treaty, Germany was to return as many volumes as the old library contained. Whitney Warren was the architect of the new building, erected through public subscription at a cost of more than \$500,000. On July 4, 1928, the library was opened with appropriate ceremonies by Mgr. Ladeuze, rector of the university, despite the attitude of the architect on account of the omission of the Latin inscription, "Furore Teutonico, Diruta: Dono Americano Restituta," which he desired. A suit to enforce the use of the original inscription was decided in favor of the architect by a Belgian court in October, 1929. Germany replaced 300,000 volumes, including a number of rare manuscripts and fifteenth-century prints. The combined international contribution added 350,000 volumes to the German contribution. The British dona-

tion of about 55,000 books was the largest. The Japanese section, which was given by the Mikado himself, contained manuscripts dating back to the ninth century. France contributed 33,000 volumes. The only reminder of the tragedy to which the new building owed its existence is a small bas-relief above Our Lady of Victory depicting the burning of the old library. See BELGIUM, under *History*.

**LOVEJOY, ARTHUR ONCKEN** (1873- ). An American philosopher (see VOL. XIV). In 1920 he collaborated with a group of other American philosophers in the publication of *Essays on Critical Realism*. The common ground of the authors is the distinction between essence and existence, which is not usually stressed by the so-called naïve realists. During the World War, Professor Lovejoy was an active propagandist for liberal ideals. He collaborated with Prof. Albert Bushnell Hart in the publication of *Handbook for the War* for *Public Speakers* (1917).

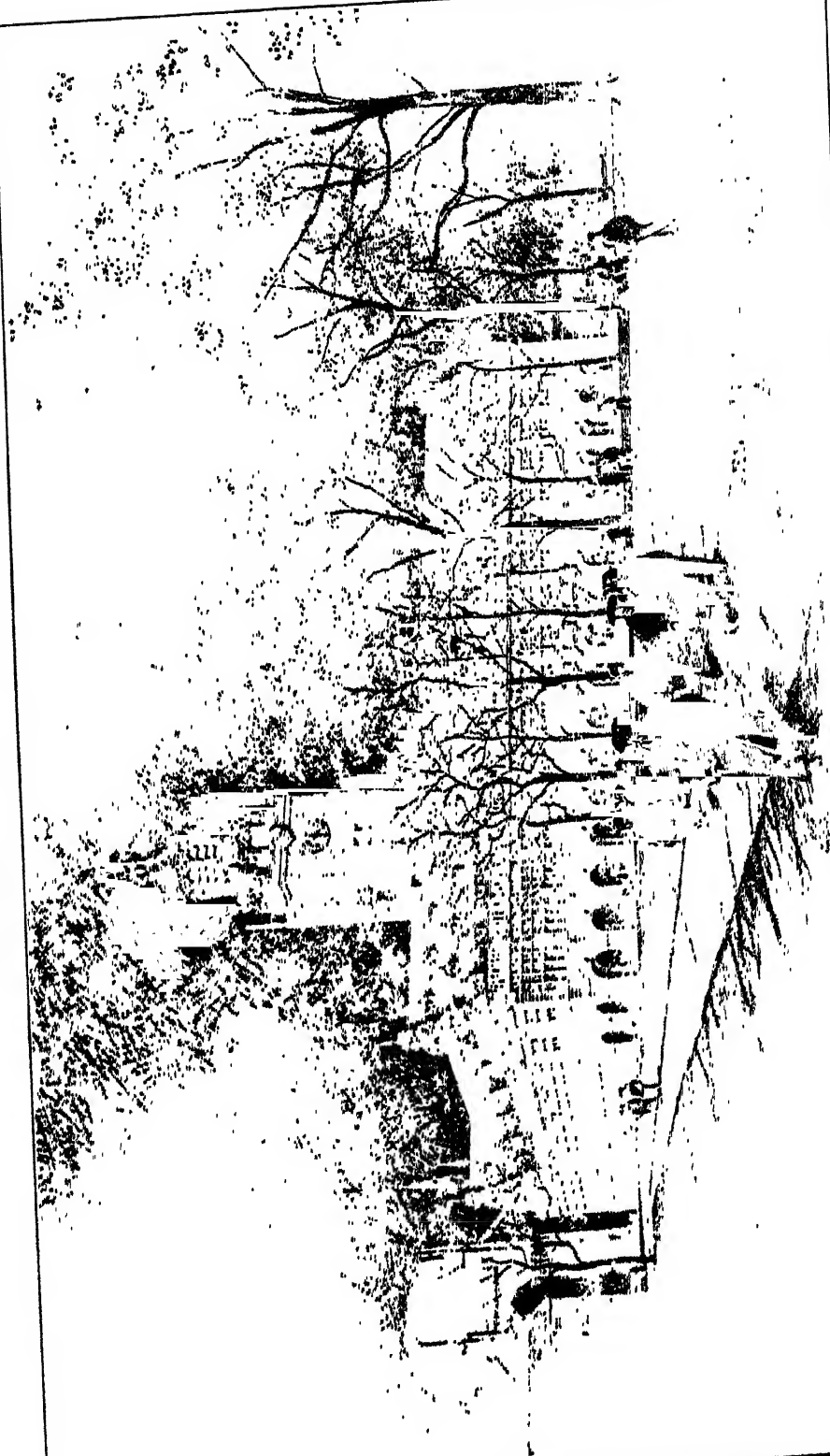
**LOVETT, ROBERT MORRIS** (1870- ). An American editor and teacher, born in Boston, Mass. He was graduated from Harvard in 1892 and in the same year became assistant in English at that university. He served as assistant professor of English from 1896 to 1904; as associate professor from 1901 to 1909, and after 1909 as full professor at the University of Chicago. From 1907 to 1920, he was dean of junior colleges. He was a member of the National Institute of Arts and Letters and was the author of *The History of English Literature*, with W. V. Moody (1902); *Richard Iresham*, a novel (1904); *The First View of English Literature*, with W. V. Moody (1905); *A Winged Victory*, a novel (1907); *Concords*, a play (1914); *Edith Wharton*, a criticism (1925). He served as editor of the *Dial* in 1919 and joined the editorial board of the *New Republic* in 1921.

**LOVETT, ROBERT SCOTT** (1860- ). An American railway president (see VOL. XIV). During the World War, he filled important positions in the management of railroads and was chosen president (1919-20) and chairman (1920) of the Board of Directors of the Union Pacific System.

**LOWDEN, FRANK ORREN** (1861- ). An American public official, born in Sunrise City, Minn. He was graduated from the Iowa State University in 1885 and studied law at the Union College of Law in Chicago. He began practice in that city in 1887, continuing until 1906. He took an active part in politics and was a member of the Republican National Committee, from 1904 to 1912. In 1906 he was elected a Representative in Congress and was twice reelected. In 1917 he was elected Governor of Illinois, serving until 1924. He was one of the prominent candidates at the Republican National Convention in 1920 and in 1924 refused the nomination for Vice President. He was candidate for the presidential nomination before the Republican National Convention of 1928, but withdrew his name.

**LOWELL.** A manufacturing city of Massachusetts. The population rose from 106,294 in 1910 to 112,759 in 1920, but decreased to 110,296 in 1925. A memorial auditorium costing \$1,000,000 was erected in 1921 in memory of the Lowell men and women who took part in the wars in which the United States has been engaged. In the same year, after 10 years of the commission form of government, the city

THE UNIVERSITY OF LOUVAIN



THE RESTORATION OF THE LIBRARY OF THE UNIVERSITY OF LOUVAIN MADE POSSIBLE BY AMERICAN GIFTS  
The Principal Façade from the Drawing of the Architects, Warren & Wetmore





returned to the mayor-and-council form. A \$2,000,000 high school was completed in 1922. In 1927 there were approximately 240 manufacturing establishments in the city, employing 18,787 persons who received \$18,888,518 in wages; the value of products manufactured was \$69,171,107. Since 1925 Lowell has changed from a cotton textile centre to a city of diversified industries. In 1927-28, 27 new industries were established, replacing the cotton textile plants which liquidated or removed to the South following the slump in the textile business of New England. The assessed valuation of property increased from \$87,277,643 in 1913 to \$136,492,851 in 1923; in 1927 it was estimated to be \$141,759,000. The net debt in 1927 was \$5,190,000. Bank clearings in 1928 amounted to \$62,881,000.

**LOWELL, AMY** (1874-1925). An American poet and critic, born at Brookline, Mass., and educated in private schools. In 1917-18 she gave lecture courses at the Brooklyn Institute of Arts and Sciences; in 1921 she was the Francis Bergen Foundation lecturer at Yale and Marshall Woods lecturer at Brown University. As a champion of free verse, as well as one of its foremost writers, her influence in this movement in the United States was of great importance. (See LITERATURE, ENGLISH AND AMERICAN.) Her published works during the post-war period were *Sword Blades and Poppy Seed* (1914); *Six French Poets* (1915); *Men, Women, and Ghosts* (1916); *Tendencies in Modern American Poetry* (1917); *Can Grande's Castle* (1918); *Pictures of the Floating World* (1919); *Legends* (1921); *Pir-Flower Tablets—Poems Translated from the Chinese*, with Florence Ayrescough (1921); *A Critical Fable* (1922); and *John Keats* (1925).

**LOWELL, IUV** (1870-1927). An American architect (see Vol. XIV). His design for a new municipal courthouse in New York was accepted in 1919. From 1917 to 1919, he was director of the Department of Military Affairs for the American Red Cross in Italy and received several decorations from the Italian government. He was the author of various books on architecture.

**LOWES, JOHN LIVINGSTON** (1867- ). An American educator, born at Decatur, Ind. He was graduated from Washington and Jefferson College in 1888 and took post-graduate courses in Germany and at Harvard University. After serving on the faculties of several colleges, he was appointed, in 1909, professor of English at Washington University, St. Louis, serving until 1918. In that year, he became professor of English at Harvard University, serving as dean of the graduate school in 1924-25. He was Lowell Institute lecturer in 1919 and was the author of *Convention and Revolt in Poetry* (1919), and *The Road to Xanadu* (1927). He edited, both alone and with others, several texts of Shakespeare.

**LOWIE, ROBERT HEINRICH** (1883- ). An American anthropologist (see Vol. XIV). Since 1921 he has been, successively, associate professor and professor of anthropology at the University of California. His principal works include: *Societies of the Arikara Indians* (1914); *Dances and Societies of the Plains Khoshones* (1915); *Notes on the Social Organization and Customs of the Mandan, Hidatsa, and Crow Indians* (1917); *Culture and Ethnology* (1917); *Plains Indian Age Societies* (1917); *Myths and*

*Traditions of the Crow Indians* (1918); *The Matrilineal Complex* (1919); *Primitive Society* (1919); *The Religion of the Crow Indian* (1922); *The Material Culture of the Crow Indians* (1922); *Crow Indian Art* (1922); *Psychology and Anthropology of Racis* (1923); *Primitive Religion* (1924); and *The Origin of the State* (1927).

**LUBARSCH, OTTO** (1860- ). A German pathologist and writer who was born in Berlin and educated at the universities of Leipzig, Heidelberg, Jena, Strassburg, and Berlin. He was professor of pathology and director of the Pathological Institute at the University of Berlin (since 1917). He wrote *Untersuchungen über die Ursachen der . . . Immunität* (1891); and *Zur Lehre von den Geschwülsten und Infektionskrankheiten* (1899). He is best known as the editor of the great work *Ergebnisse der allgemeinen Pathologie und pathologischen Anatomie*, which, begun in 1895, has now run through 30 large volumes and has also furnished a model for numerous other works of the same type.

**LUBIN, DAVID** (1840-1919). American agricultural specialist and merchant. He was for many years in business at Sacramento, Calif., but interested himself in improving the system of marketing agricultural products, promotion of complete and systematic statistical information, and development of rural credits, national marketing, etc. He succeeded in bringing before Congress a proposal for an international convention for the establishment of the International Commerce Commission on Merchant Marine (the measure passed Sept. 1, 1914); and he also secured the introduction of a measure for improving the parcel post service, facilitating direct dealing between producers and consumers (1916). His proposals for the International Institute of Agriculture were embodied in that institution, which has since supplied world crop, import, and export reports, etc., and to which he was the American delegate. Mr. Lubin died at Rome, Italy, Jan. 1, 1919. See AGRICULTURE, INTERNATIONAL INSTITUTE OF.

**LUCAS, EDWARD VERRALL** (1868- ). An English essayist, biographer, writer on travel, and publisher (see Vol. XIV). His later volumes of essays include: *Cloud and Silver* (1910); *Twist Eagle and Dove* (1918); *Mixed Vintages* (1919); *Adventures and Enthusiasms* (1920); *Giving and Receiving* (1922); *Encounters and Diversions* (1924); *Events and Embroideries* (1926); and *A Fringed Isle* (1927). His later travel books were: *London Revisited* (1916); *Roving East and Roving West*, in India, Japan, and America (1921); *Zigzags in France* (1925); *Introducing London* (1925); *A Wanderer in Rome* (1926); and *Introducing Paris* (1928). On art, besides brief sketches in *The Great Masters Series*, he wrote *Vermeer of Delft* (1922); *A Wanderer Among Pictures* (1924); and *John Constable, the Painter* (1925). Other later works include: *Quoth the Raven: An Unofficial History of the War* (with G. Morrow, 1919); *London Lavender* (1919); *Vereen in the Midst* (1920), the last two being fiction; and *The Colvins and their Friends* (1928). Consult E. V. Lucas: *Appreciations*, by John Farrar, R. E. Sherwood, Grant Overton, and Llewellyn Jones (1925).

**LUDENDORFF, ERICH** (1865- ). A Prussian general, born at Kruszevnia, near

Posen. He worked out the last great German Army Bill passed by the Reichstag in 1913. On the outbreak of the World War, he was first sent to the western front, where he took the citadel at Liège. On Aug. 22, 1914, he was sent to the eastern front as chief of the General Staff and shared with Hindenburg the credit of the great victories at Tannenburg and the Masurian Lakes. During the progress of the War, his advance was rapid and constant. He organized the great German offensive of the spring and summer of 1918, whose final collapse led to the German defeat. After the War, he was a leader of those seeking the return of the monarchy. He published among other works *Meine Kriegserinnerungen* (1914-18); *Kriegsführung und Politik* (1919); *Die Verschiebung der Verantwortlichkeit* (1919); *Die Schuld der überstaatlichen Mächte am Zusammenbruch* (1927).

**LUDWIG, LOOTVIK, EMIL** (1881- ). A German writer who was born at Breslau and studied at the university there. He wrote verse and prose, fiction, drama, essays, and biography. His plays include: *Napoleon* (1906); *Der Spiegel von Shalott* (1907); *Trilogie der Renaissance* (1904-20); *Atalante, Ariadne* (1914); *Friedrich von Preussen* (1914); *Bismarck*, a trilogy of plays (1923). His novels are *Manfred und Helene* (1911); *Diana* (1918); *Meeresstille und glückliche Fahrt* (1920). He is also the author of the essays, *Der Künstler*; *Bismarck, eine psychologische Studie* (1911); *Goethe, Geschichte eines Menschen* (1920); the lyric volume *Römische Sonette* (1921); *Jenie und Charakter* (1925, English trans., 1927); *Bismarck*, a biography (1928, English trans., 1928); an English translation of *Goethe: the History of a Man* (1928); *Der Menschensohn* (1928), in English, *The Son of Man: The Story of Jesus* (1928); *Juli 14*, a study of the outbreak of the World War (1929); *Art and Destiny* (1929); and *Diana*, two volumes (1929).

**LUMBER.** See FORESTRY.

**LUMEN.** See ELECTRIC LIGHTING.

**LUMINESCENCE IN ANIMALS.** See ZOÖLOGY, under *Physiology*.

**LUSITANIA, SINKING OF.** See WORLD WAR, DIPLOMACY OF THE; SUBMARINES AND THEIR WAR ACTIVITIES.

**LUTHERANS.** The third Protestant church in size in the United States, established officially in America in 1648, historic records showing Lutherans in America as early as 1502. The congregations, the central units and seat of final authority, were organized in synods or general bodies. The Lutherans of the United States and Canada accept the Canonical Scriptures of the Old and New Testaments as the inspired Word of God and as the only infallible rule and standard of faith and practice. They accept and confess the three ecumenical creeds, namely, the Apostles, the Nicene, and the Athanasian. They accept and hold the Unaltered Augsburg Confession as the correct exhibition of the faith and doctrine of the Evangelical Lutheran Church, founded upon the Word of God. All accept and use Luther's Small Catechism. None reject any of the other Symbolical Books of the Evangelical Lutheran Church, namely, the Apology of the Augsburg Confession, the Smalkald Articles, the Large Catechism of Luther, and the Formula of Concord. Many accept all of these.

The following statistical table shows the totals of the parochial reports made in 1914 and 1928:

	1914	1928
Congregations	14,871	16,686
Ministers	9,407	11,234
Baptized Members	3,684,315	4,210,500
Confirmed Members	2,370,658	2,728,620
Congregational Expenses	\$10,275,269	\$45,467,848
Benevolent Contributions	3,214,644	11,969,677
Total Expenditures	13,489,913	57,262,521
Total Valuation of Property	99,019,621	324,600,605
Sunday Schools—Number	5,923	11,671
Officers and Teachers	70,112	125,487
Scholars	927,737	1,447,538

During the period, foreign mission and educational work was carried on extensively. After the World War, many mission fields which formerly had been supported by the Lutherans of Germany were aided through the National Lutheran Council.

The outstanding events of the period among the Lutherans of the United States and Canada were: the celebration in 1917 of the 400th anniversary of Luther's posting of the Ninety-Five Theses; the formation of the Norwegian Lutheran Church of America by the merging of three Lutheran organizations in 1917; the formation by the merging of several other bodies in 1918 of the United Lutheran Church in America, which included in its membership more than one-third of all the Lutherans in the United States and Canada; and the formation of the Evangelical Lutheran Joint Synod of Wisconsin and Other States; the appearance in 1917 of the Lutheran *Common Service Book*; the organization in the same year of the National Lutheran Commission for Soldiers' and Sailors' Welfare, which was supported by the various general bodies and churches; and the organization in 1918 of the National Lutheran Council, an agency for two-thirds of the Lutherans of the United States and Canada for carrying on the regular work of representation, statistics, reference, and publicity, and also emergency relief work. This latter agency gave at least \$6,500,000 including more than \$2,800,000 in the form of clothing, and over \$3,700,000 in the form of cash, for the relief of Lutherans in Europe. In 1927 at the World Conference on Faith and Order, the Lutheran representatives from all parts of the world united in their conservative views of faith and doctrine.

Among the celebrations of the period were: the 400th anniversaries of Luther's appearance before the Diet of Worms, of the appearance of Luther's translation of the New Testament, and of the introduction of congregational singing and the development of hymnology under the influence of the Reformation; and the anniversaries, 175th, 100th, 75th, and 50th, respectively, of the Pennsylvania Ministerium, the Maryland Synod, the Missouri Synod, and the Synodical Conference. The Muhlenberg Building was dedicated in 1924 by the United Lutheran Publication House. Led by the veteran, Dr. George U. Wenner, the Lutherans reemphasized religious education, especially promoting the idea of weekday religious instruction after school hours. Tens of millions of dollars were subscribed for endowments of Lutheran educational institutions, and millions of dollars were generously contributed to the Ministerial Relief and Pension Funds.

The Lutherans of America took part in the first Lutheran World Convention held at Eisenach, Germany, Aug. 19 to 26, 1923. There were 160 delegates and representatives from 22

or more nations of Europe, Asia, North America, and Australia. With the exception of the Synodical Conference of North America, with about 1,000,000 members, they represented the Lutherans of the world, or at that time about 80,000,000 members. Carefully prepared papers including doctrinal and practical themes of fundamental importance were presented, followed by free discussions. The Rt. Rev. Ludwig Ihmels, D.D., Bishop of Saxony, was made chairman of the convention. The following doctrinal statement was unanimously adopted: "The Lutheran World Convention acknowledges the Holy Scriptures of the Old and New Testaments as the only source and the infallible norm of all Church teaching and practice; and sees in the Lutheran Confessions, especially the Unaltered Augsburg Confession and Luther's Small Catechism, a pure exposition of the Word of God." Final preparations were made in 1928 for the Lutheran World Convention, to be held in June, 1929, the 400th anniversary of the year of the publication of Luther's Small Catechism. According to the statistics of the United Lutheran Church for 1929, there were 70,000 Lutheran congregations throughout the world, with 49,000 pastors, and 81,023,180 baptized members.

**LUTYENS**, SIR EDWIN L. (1869- ). A British architect, who was educated privately. He was architect for the Government House at Delhi, India, and designed the Whitehall Cenotaph; the British School of Art at Rome; the Picture Gallery and South African War Memorial, Johannesburg, and various other buildings. In 1929 he was selected as architect for the proposed Roman Catholic Cathedral in Liverpool. He was knighted in 1918 and made a member of the Royal Academy in 1920.

**LUXEMBURG**. This Grand Duchy, bounded by Germany, Belgium, and France, has an area of 999 square miles and population of 285,521 (1927). The population in 1910 was 259,899. The capital, Luxembourg, had 52,440 inhabitants in 1927, as compared with 20,848 in 1910. The activities of the population are equally divided between agriculture and industry. The principal crops are oats and potatoes, while the vine is cultivated in the Moselle Valley region. The economic wealth of the country is, however, centred in its iron fields which continue to average an annual yield of 7,000,000 tons (7,244,000 in 1927). The iron ore is employed in the manufacture of pig iron and steel by local works. In 1912 the production of pig iron was 2,252,229 tons; in 1918 it was only 1,226,671 tons; but after the War it recovered, reaching 3,704,390 tons in 1920 and 2,770,061 tons in 1928. The production of steel continued steadily to lose ground; 1,296,407 tons were produced in 1916; by 1920, only 692,935 tons. Starting with 1924, however, it exceeded pre-war production and reached 2,567,080 tons in 1928.

Although, in accordance with the Treaty of London (1867), Luxembourg, like Belgium, was permanently neutralized, and its integrity and independence guaranteed, nevertheless, like Belgium again, the grand duchy was invaded by German troops, Aug. 2, 1914, and occupied throughout the War. The conclusion of the War saw the appearance of a new independent spirit in the population. Agitation in particular was aimed at the severance of the economic union with Germany, in existence since 1842, as well as for the erection of a more liberal

frame of government. The result was the abdication of the Grand Duchess Marie Adelaide on Jan. 12, 1919, the ascension to the throne of the Princess Charlotte, and the holding of a plebiscite in September for the determination of the political and economic status of the country. The vote on the former indicated that the Luxemburgers preferred the continuance of the ruling dynasty to a republic; on the question of a new economic union, 60,133 votes were cast in favor of alliance with France against 22,242 in favor of a Belgian alliance. In 1921, however, France yielded up her rights to Belgium with the result that a treaty, completed on July 25, 1921, effected an agreement between Belgium and Luxembourg by which the two agreed to level their customs barriers for 50 years. The agreement went into effect May 1, 1922.

**LUXEMBURG**, lüks'em bürg, ROSA (1870-1919). A German-Jewish Socialist and revolutionary leader, born in Poland. She entered Germany in 1895 and after employment on various socialist newspapers, she went to Poland to aid the Russian revolutionary movement there in 1905, but soon returned to Germany and engaged in extreme propaganda. With Karl Liebknecht, she founded the Spartacus League. In 1914 at the outbreak of the World War, she was sentenced to a year's imprisonment for inciting insubordination. Throughout the War, she remained in preventive custody. When set at liberty again, she instigated street fighting in Berlin and was beaten by a mob and shot to death on Jan. 15, 1919.

**LUXURY TAXES**. See TAXATION IN THE UNITED STATES.

**LVOV**, l'vóf, GEORGE EUGENIEVITCH, PRINCE (1861-1925). A Russian statesman who received his law degree in 1885. He owned great estates and devoted much of his time to the organization and development of the Zemstvos, or agricultural cooperative societies. He was a member of the right wing of the Constitutional Democratic Party, and, in 1905, of the first Duma. During the Russo-Japanese War, he organized relief among the Zemstvos, and also carried on this work during the World War. In March, 1917, at the outbreak of the Russian Revolution, he was chosen Premier and Minister of the Interior in the provisional Government, but his opinions were so frequently at variance with those of the Socialists that he resigned in July. The Bolsheviks arrested him and took him to Ekaterinberg, but he escaped and finally settled in Paris, where he was a leader of the anti-Bolshevist movement.

**LYAUTEY**, li-ó'té, LOUIS HUBERT GONZAGE (1854- ). A French soldier, administrator, and writer (see Vol. XIV), a member of the French Academy. In 1912 he was appointed resident Minister in Morocco, holding also the office of Minister of Foreign Affairs. He administered this office with great efficiency and was successful in promoting the agriculture and trade of the colony. In 1916-17 he served for a short time as War Minister in the cabinet of Briand, but on the fall of that cabinet he was reappointed to Morocco by Ribot and Poincaré. He was made a Marshal of France in 1920, the only one ever created who had not fought in France, and in 1928 he received the gold medal of the English African Society, the first recipient not an Englishman. He was recalled in October, 1925. His later publications include *Lettres de Tonkin et de Madagascar, 1894-99* (1920); *La réunion*

de la Lorraine à la France (1926); and *Paroles d'action, 1900-26* (1927). Consult *La France au Maroc. L'œuvre du général Lyautey*, by Gaulis (1919) and *Le maréchal Lyautey*, by Britsch (1921).

**LYDSTON, GEORGE FRANK** (1858-1923). An American surgeon and publicist born at Tuolumne, Calif., and educated in medicine in the New York University (M.D., 1879). After several years in New York, he settled in Chicago and was appointed professor of genito-urinary surgery and venereal diseases under the medical department of Illinois University. He was the first to write at length on the subject of sex gland-grafting in the male. His major writings comprise *Lectures on Syphilis* (1885); *Addresses and Essays* (1892); *Stricture of the Urethra* (1893); *Gonorrhea and Urethritis* (1892); *Surgical Diseases of the Genito-urinary Tract* (1899-1904); *The Diseases of Society* (1904); *Sex Hygiene for the Male* (1912); *Implantation of the Sex Glands* (1914); *Impotence and Sterility* (1917).

**LYMAN, EUGENE WILLIAM** (1872- ). An American theologian, born at Cummington, Mass. He was graduated from Amherst College in 1894 and took post-graduate courses at Yale and in Germany. After teaching in several schools, he was appointed professor of philosophy at Carleton College, Minn., in 1901, and was professor of theology at the Congregational College of Canada, Montreal, in 1904-05. From 1904 to 1913, he was a member of the faculty of Bangor Theological Seminary, and from 1913 to 1918, professor of the philosophy of religion and Christian ethics at Oberlin College. In 1918 he became professor of the philosophy of religion at the Union Theological Seminary in New York. He wrote *Theology and Human Problems* (1910); *God of the New Age* (1918); *Experience of God in Modern Life* (1918); *The Meaning of Selfhood and Faith in Immortality* (1928).

**LYMAN, THEODORE** (1874- ). An American physicist, born at Boston, Mass. He was graduated from Harvard in 1897, where he also received his Ph.D in 1900. He became an assistant in physics at Harvard, where he remained, becoming full professor (1917-26), and where he was also director of the Jefferson Physical Laboratory (1908-17). He is now emeritus. Dr. Lyman made important studies on phenomena connected with diffraction gratings, on the wave lengths of extreme ultra-violet light discovered by Schumann and also on the properties of light of extremely short-wave length, on all of which he contributed valuable papers to the literature of physics in the proceedings of scientific societies. During the World War, he served in France with the American Expeditionary Forces, holding the rank of major of engineers. See **PHYSICS**.

**LYNCHINGS.** According to the department of records and research of the Tuskegee Institute, there was a total of 861 lynchings in the United States during the period 1914-28. Of the victims, 64 were whites and 597 were Negroes. The number of lynchings by years and the alleged causes for the perpetration of these crimes are shown in the accompanying tables.

The period 1914-28 was notable for (1) a growing sentiment against lynchings and (2) a large decrease in the number of lynchings. The growing sentiment against lynchings manifested

itself in (a) the attitude of the press of the country, particularly the editorial policy of the leading newspapers, in speaking strongly against it; (b) expressions of religious denominations, particularly through the Federal Council of Churches; (c) expressions of organizations of white women of the South; (d) agitation for the enactment of laws against lynchings; and (e) the passing of laws by a number of States for the suppression of lynching. The agitation for suppressive legislation had its strongest expression in the effort to have a Federal anti-lynching law enacted. This effort extended over the entire period, though after 1924 demands for it had become less insistent. In 1920 an anti-lynching measure, later known as the Dyer Anti-lynching Bill, was jointly introduced in the

NUMBER OF LYNCHINGS

Year	Whites	Negroes	Total
1914	3	40	52
1915	13	54	67
1916	4	50	54
1917	2	36	38
1918	4	60	64
1919	7	76	83
1920	8	53	61
1921	5	59	64
1922	6	51	57
1923	4	29	33
1924	..	16	16
1925	..	17	17
1926	7	23	30
1927	..	16	16
1928	1	8	9
	64	597	661

ALLEGED CAUSES FOR LYNCHING

Year	Homicide	Felonious Assault	Rape	Attempted Rape	Robbery and Theft	Insults to Women	All Other Causes
1914	30	8	6	1	1	..	6
1915	26	10	11	..	9	3	6
1916	20	7	3	9	8	2	5
1917	6	2	7	5	2	2	14
1918	28	2	10	6	2	..	16
1919	28	3	9	10	1	6	26
1920	22	9	15	3	..	3	9
1921	19	7	16	3	..	3	16
1922	15	5	14	5	4	1	13
1923	5	4	6	1	1	1	15
1924	3	2	5	4	..	2	..
1925	8	..	4	2	..	1	2
1926	13	2	2	3	1	3	5
1927	7	2	2	3	..	..	2
Totals	230	63	110	55	29	27	137

House and Senate of the United States Congress. The press of the South strongly opposed the bill on the ground that it was an invasion of States' rights; and a Democratic filibuster in the House of Representatives in 1921 prevented its coming to a vote. On Jan. 26, 1922, however, the House passed the bill by a vote of 230 to 119. When the measure reached the Senate, the question of its constitutionality was brought forward. On July 28, 1922, the Senate Judiciary Committee ruled that it was constitutional. A well-organized filibuster by the Democratic members of the Senate prevented it, however, from coming to a vote and on Dec. 2, 1922, the Republican caucus agreed to drop the measure and not to call it up again during that session of Congress.

With the defeat of the Dyer Anti-lynching Bill, newspapers and women's organizations of the South urged that it was now up to the States to take preventive measures. Such action was taken by 10 States, either by the enactment of

new laws or the strengthening of existing legislation against lynching. These States were Alabama, Kansas, Kentucky, Minnesota, New Jersey, North Carolina, Pennsylvania, Tennessee, West Virginia, and Virginia. In 1928 Virginia, which had been particularly harsh against mob rule, passed a law making lynching a State offense. Prosecutions against persons involved in lynchings were to be handled by the attorney general or by special prosecutors appointed by the governor. In other States, notably Kentucky and Florida, law officers defended their prisoners against mobs with every effort in their power, sometimes calling out the State militia.

The decrease in lynchings over the period being reviewed is shown by the following table:

COMPARISON OF LYNCHINGS BY DECADES  
1884-1928

Decade	Number of Lynchings		Total
	White	Negroes	
1884-1893	751	990	1,741
1894-1903	322	1,020	1,342
1904-1913	63	673	736
1914-1923	56	517	573
(half-decade)			
1924-1928	8	80	88

A discussion of the entire subject is to be found in White, *Rope and Faggot* (New York, 1929). See RACE PROBLEMS, UNITED STATES.

**LYND, ROBERT** (1879- ). An Irish journalist, essayist, and literary critic. He was born in Belfast, educated at the Royal Academical Institution and Queen's College, Belfast, and then moved to England to live and work. His many publications, largely made up of essays, include *Irish and English: Portraits and Impressions* (1908); *Rambles in Ireland* (1912); *The Book of This and That* (1915); *If the Germans Conquered England, and Other Essays* (1917); *Ireland a Nation* (1919); *The Pleasure of Ignorance* (1921); *The Blue Lion* (1923); *The Money-Box* (1925); *The Little Angel* (1926); *Dr. Johnson and His World* (1927); *The Bunch of Grapes* (1927); *The Goldfish* (1928); and *Dr. Johnson and Company* (1928).

**LYNN.** A manufacturing city of Massachusetts. The population increased from 89,336 in 1910 to 99,148 in 1920 and to 105,500 in 1928, according to the estimate of the U.S. Bureau of the Census. In 1918 the city government was changed from the commission form, adopted in 1910, to the mayor-and-council form, with one councilor from each ward and four elected at large. In 1926-27 the city spent \$1,500,000 on sewer development; the school-building programme called for an expenditure of \$3,000,000. The value of boots and shoes manufactured in Lynn in 1927 was \$26,696,393; of leather, including tanned, curried, and finished products, \$9,133,033, and of allied manufactures, such as blacking, lasts, and boot and shoe findings, \$16,460,029. The city ranked fifth among the cities of the United States in value of boots and shoes manufactured, being surpassed by New York, St. Louis, Milwaukee, and Boston. The total value of all manufactures rose from \$95,031,943 in 1921 to \$100,863,774 in 1927. Of these the most important were automobile accessories, foundry products, wire goods, electrical machinery, high-frequency apparatus, incandescent lamps, are lamps, medicine, and soap. In 1927, 20,763 persons were employed in 358 industrial establishments and received \$28,516,520 in wages. Approximately 12,000 persons were employed in

two large plants of the General Electric Company. The assessed valuation of property in 1928 was \$137,259,350; the net debt was \$6,050,991.

**LYON, BETHUEL B. VINCENT** (1880- ). An American physician, gastroenterologist, who has introduced into clinical medicine a new method of diagnosis and treatment of gall-bladder disease, termed by him "nonsurgical drainage of the gall bladder"; which is secured through the introduction of the duodenal sound through the stomach. Dr. Lyon received the degree of M.D. from Johns Hopkins in 1907 and was appointed professor of clinical medicine in Jefferson Medical College, in the department of gastrointestinal diseases. He has done much original work in connection with the diagnostic and therapeutic use of the duodenal sound, collaborating for a time with the late Dr. Meltzer, and in 1923 first appeared his pioneer work, *Nonsurgical Drainage of the Gall Ducts*, which has given rise to much controversy.

**LYONS.** An important manufacturing city of France, capital of the Department of the Rhône, and 468 kilometers (290.8 miles) from Paris. The population at the census of 1926 was 570,840. Lyons is becoming an important inland shipping centre, the quays along the Rhône and Saône extending more than 30 kilometers (18.6 miles). The completion of the Marseilles-Rhône Canal has done much to increase the water traffic of Lyons, 1500-ton barges now being able to reach it from Mediterranean ports. See MARSEILLES. Since the World War, plans have been under way for the development of the water power of the Rhône River, which is estimated at 750,000 horse power, or the equivalent of 5,000,000 tons of coal, per annum.

The leading industries of Lyons are glassware, chemical products, perfumery, silks and artificial fabrics, glue, gelatines, shoe polish, fertilizers, dyes, plastic materials, iron and steel, brass articles, automobiles, furniture, gloves, embroideries, hats, wines, confectionery, biscuits, paper, and watches. As the centre of the French silk trade, Lyons continues to wield an influence over the entire industry, although it is no longer most important from the standpoint of actual production. In the design of fabrics, in the regulation of their sale, and in relation to the silk consumption of the world, the leaders of the Lyons silk industry play a leading part. The production of silk fabrics in Lyons and vicinity reached a total value in 1927 of 4,586,000,000 francs which, converted to gold francs, amounted to 935,000,000 gold francs or \$180,000,000. The value of exports of silk fabrics was 2,200,000,000 francs. During the War, many industries from northern France established themselves in Lyons and vicinity. The most important of these were structural and mechanical steel plants, steam-engine and automobile factories. An annual International Manufacturers' Sample Fair was established in 1916 at Lyons, the total number of exhibitors at the 1928 fair being 3362. The largest number of foreign exhibitors were from Germany, the United States, Switzerland, England, Belgium, Italy, and Japan. A permanent exhibition building has been erected on the banks of the Rhône. The great volume of business transacted in Lyons is evidenced by the development of important financial institutions; of these, the *Crédit Lyonnais*, which has more than 1000 branches distributed throughout the world, is the best known.



Lyons was one of the first cities to take advantage of State aid in the building of moderate-priced houses, authorized under the so-called Loucheur project by the 1928 Act of the French Parliament. The municipal authorities arranged to construct 5000 dwellings at the rate of 1000 each year, the state furnishing 90 per cent of the total cost and the city supplying the remainder. The Wilson Bridge over the Rhône River, named in honor of the President of the United States, was dedicated on July 14, 1918. It consisted of four elliptical arches, 138 feet, 148 feet, 161 feet, and 148 feet in span, with an approach arch at each end, making the total length of the bridge 743 feet. The width was 66 feet, with provision for a roadway 36 feet wide for railway tracks and two sidewalks, each 15 feet wide. The unique feature of this bridge is that it combines the architectural features of the stone arch with the structural advantages of reinforced concrete. The total cost of construction was approximately \$430,000. The Monument aux Morts, a War Memorial erected in 1926, is one of the most impressive in France.











